
IP Routing Configuration Commands

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1 RIP Commands

1.1 address-family

Use this command to configure the RIP protocol in address family configuration sub-mode. Use the **no** form of this command to restore the default setting.

address-family ipv4 vrf vrf-name

no address-family ipv4 vrf vrf-name

Parameter Description	Parameter	Description
	vrf vrf-name	Specifies the VRF name associated with the sub-mode command.

Defaults The address family of the RIP protocol is not configured by default.

Command Mode Route configuration mode

Usage Guide Use the **address-family** command to enter the address family configuration sub-mode. The prompt is (config-router-af) #. When you specify the VRF associated with the sub-mode for the first time, the RIP instance corresponding to the VRF will be created. In the sub-mode, you can configure the VRF RIP routing information.
To remove the address family sub-mode and return to the route configuration mode, use the **exit-address-family** or **exit** command.

Configuration Examples The following example creates a VRF with the name of vpn1 and creates its RIP instance.

```
Orion_B54Q(config)# ip vrf vpn1
Orion_B54Q(config-vrf)# exit
Orion_B54Q(config)# interface fastEthernet 1/0
Orion_B54Q(config-if-FastEthernet 0/1)# ip vrf forwarding vpn1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 192.168.1.1
255.255.255.0
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router)# network 192.168.1.0
Orion_B54Q(config-router)# exit-address-family
```

Related Commands	Command	Description
	exit-address-family	Exits the address family configuration sub-mode.
	ip vrf	Creates a VRF.

Platform N/A
Description

1.2 auto-summary

Use this command to enable automatic summary of RIP routes. Use the **no** form of this command to disable this function

auto-summary
no auto-summary

Parameter Description	Parameter	Description
	N/A	N/A

Defaults Automatic summary of RIP routes is enabled by default

Command

Mode Routing progress configuration mode

Usage Guide Automatic RIP route summary means the subnet routes will be automatically summarized into the routes of the classified network when they traverse through the subnet. Automatic route summary is enabled by default for RIPv1 and RIPv2.

Automatic RIP route summary improves the flexibility and effectiveness of the network. If the summarized route exists, the sub-routes contained in the summarized route cannot be seen in the routing table, reducing the size of the routing table significantly.

Advertising the summarized route is more efficient than advertising individual routes in light of the following factors:

- The summarized route is always processed preferentially when you query the RIP database.
- Any sub-route is ignored when you query the RIP database, reducing the processing time.
- If you want to learn the specific sub-routes instead of the summarized route, disable the automatic route summary function. Only when RIPv2 is configured, the automatic route summary function can be disabled. For the RIPv1, the automatic route summary function is always enabled.

i The range of the supernet route is wider than that of the classful network. Therefore, this command takes no effect on the supernet route.

Configuration Examples The following example disables automatic route summary of RIPv2.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# version 2
Orion_B54Q (config-router)# no auto-summary
```

Related	Command	Description
---------	---------	-------------

Commands	
version	Defines the RIP software versions: v1 or v2. Both v1 and v2 are supported by default.

Platform N/A

Description

1.3 bdf all-interfaces

Use this command to enable all interfaces running RIP to use the BDF function. Use the **no** form of this command to restore the default setting.

bdf all-interfaces

no bdf all-interfaces

Parameter Description	Parameter	Description
	N/A	N/A

Defaults BFD is not configured by default.

Command Routing process configuration mode

Mode

Usage Guide With the BFD function enabled on the RIP, one BFD session will be established for the RIP routing information source (the source address of the RIP route update packet). Once the BFD neighbor fails, the RIP routing information will be invalid directly and no longer join routing or forwarding. You can also use the interface configuration mode command **ip rip bfd [disable]** to enable or disable the BFD function on the specified interface, which takes precedence over the command **bdf all-interfaces** in the routing progress configuration mode.

Configuration Examples N/A

Related Commands	Command	Description
	route ip	Creates the RIP routing progress and enters the routing process configuration mode.
	ip rip bfd [disable]	Configures a specified interface running RIP to enable or disable link detection using the BFD.

Platform N/A

Description

1.4 default-information originate

Use this command to generate a default route in the RIP process. Use the **no** form of this command to delete the generated default route.

default-information originate [**always**] [**metric** *metric-value*] [**route-map** *map-name*]

no default-information originate [**always**] [**metric**] [**route-map** *map-name*]

Parameter Description

Parameter	Description
always	(Optional) Enables RIP to generate the default route, no matter whether the default route exists or not.
metric <i>metric-value</i>	(Optional) The original metric value of the default route with the value range 1-15 of <i>metric-value</i> .
route-map <i>map-name</i>	(Optional) Name of the associated route-map. Route-map is not associated by default.

Defaults

No default route is generated by default.

The default metric value is 1.

Command

Mode

Routing process configuration mode

Usage Guide

By default, RIP will not advertise the default route if the default route exists in the routing table of the router. In this case, use the **default-information originate** command to notify the neighbor of the default route.

With the parameter **always** configured, no matter whether the default route exists in the RIP routing process or not, the default route will be advertised to the neighbor but is not shown in the local routing table. You can use the **show ip rip database** command to view the RIP routing information database to confirm whether the default route is generated.

Use the parameter **route-map** to control more about the default route advertised to RIP. For example, use the **set metric** command to set the metric value of the default route.

The route-map set metric rule takes precedence over the parameter metric value configuration of the default route. If the parameter metric is not configured, the default metric value is used by the default route.

- ❗ If the default route can be generated in the RIP process by using this command, RIP will not learn the default route advertised from the neighbor.
- ❗ For the default route generated by using the ip default-network command, the default-information originate command is required to add the default route to RIP.

Configuration Examples

The following example generates a default route to the RIP routing table.

```
Orion_B54Q(config-router)# default-information originate always
```

Related Commands

Command	Description
---------	-------------

ip rip default-information	Notifies the default route through an interface.
redistribute	Redistributes the routes from other protocols to RIP.

Platform N/A
Description

1.5 default-metric

Use this command to define the default RIP metric value. Use the **no** form of this command to restore the default setting.

default-metric *metric-value*
no default-metric

Parameter Description	Parameter	Description
	<i>metric-value</i>	Indicates the default metric value with the range from 1 to 16. If the metric value is greater than or equal to 16, the RGNOS regards the route unreachable.

Defaults The default is 1.

Command

Mode Routing process configuration mode

Usage Guide This command needs to work with the command **redistribute**. When the routes are redistributed to the RIP routing process from a routing protocol process, the route metric value cannot be converted due to the incompatibility of the metric calculation mechanisms for different protocols. During the conversion, therefore, it is required to redefine the metric values of redistributed routes in the RIP routing domain. If there is no clear definition of the metric value in redistributing a routing protocol process, the RIP uses the metric value defined with **default-metric**. If the metric value is defined, this value overwrites the metric value defined with default-metric. If this command is not configured, the default value of default-metric is 1.

Configuration Examples The following example enables the RIP routing protocol to redistribute the routes learned by the OSPF routing protocol, whose initial RIP metric value is set to 3.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# default-metric 3
Orion_B54Q (config-router)# redistribute ospf 100
```

Related Commands	Command	Description
	redistribute	Redistributes the routes from one routing domain to another routing domain.

Platform N/A

Description**1.6 distance**

Use this command to set the management distance of the RIP route. Use the **no** form of this command to restore the default setting.

distance *distance* [*ip-address wildcard*]

no distance [*distance ip-address wildcard*]

Parameter Description

Parameter	Description
<i>distance</i>	Sets the management distance of a RIP route, an integer in the range from 1 to 255.
<i>ip-address</i>	Indicates the prefix of the source IP address of the route.
<i>wildcard</i>	Defines the comparison bit of the IP address, where 0 means accurate matching and 1 means no comparison.

Defaults The default is 120.

Command

Mode Routing process configuration mode

Usage Guide

Use this command to set the management distance of the RIP route.

You can use this command to create several management distances with source address prefixes.

When the source address of the RIP route is within the range specified by the prefixes, the corresponding management distance is applied; otherwise, the route uses the management distance configured by the RIP.

Configuration Examples

The following example sets the management distance of the RIP route to 160, and specifies the management distance of the route learned from 192.168.2.1 as 123.

```
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# distance 160
Orion_B54Q(config-router)# distance 123 192.168.12.1 0.0.0.0
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description**1.7 distribute-list in**

Use this command to control route update for route filtering. Use the **no** form of this command to restore the default setting.

```

distribute-list { [ access-list-number | name ] | prefix prefix-list-name [ gateway prefix-list-name ] | [ gateway prefix-list-name ] } in [ interface-type interface-number ]
no distribute-list { [ access-list-number | name ] | prefix prefix-list-name [ gateway prefix-list-name ] | [ gateway prefix-list-name ] } in [ interface-type interface-number ]
    
```

Parameter Description	Parameter	Description
	<i>access-list-number</i> <i>name</i>	Specifies the ACL. Only the routes that are allowed by the ACL can be accepted.
	prefix <i>prefix-list-name</i>	Uses the prefix list to filter the routes.
	gateway <i>prefix-list-name</i>	Uses the prefix list to filter the source of the routes.
	<i>interface-type</i> <i>interface-number</i>	(Optional) Applies the distribution list only to a specified interface.

Defaults The distribution list is not defined by default.

Command Mode Routing process configuration mode

Usage Guide To deny receiving some specified routes, you can process all the received route update packets by configuring the route distribute control list. Without any interface specified, the system will process the route update packets received on all the interfaces.

Configuration Examples The following example enables RIP to control the routes received from the Fastethernet 0/0, only permitting the routes starting with 172.16.

```

Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# network 200.168.23.0
Orion_B54Q (config-router)# distribute-list 10 in fastethernet 0/0
Orion_B54Q (config-router)# no auto-summary
Orion_B54Q (config-router)# access-list 10 permit 172.16.0.0 0.0.255.255
    
```

Related Commands	Command	Description
	access-list	Defines the ACL rule.
	prefix-list	Defines the prefix list.

Platform Description N/A

1.8 distribute-list out

Use this command to control route update advertisement for filtering routes. Use the **no** form of this command to restore the default setting.

```

distribute-list { [ access-list-number | name ] | prefix prefix-list-name } out [ interface | [ bgp |
    
```


connected | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]]
no distribute-list { [*access-list-number* | *name*] | **prefix** *prefix-list-name* } **out** [*interface* | [**bgp** |
connected | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]]

Parameter Description

Parameter	Description
<i>access-list-number</i> <i>name</i>	Specifies the ACL.
prefix <i>prefix-list-name</i>	Uses the prefix list to filter routes.
<i>interface</i>	(Optional) Applies route update advertisement control to a specified interface in the distribution list.
bgp	(Optional) Applies route update advertisement control to only routes introduced from bgp in this distribution list.
connected	(Optional) Applies route update advertisement control to only connected routes in this distribution list.
isis [<i>area-tag</i>]	(Optional) Applies route update advertisement control to only routes introduced from ISIS in this distribution list. <i>area-tag</i> specifies an ISIS instance.
ospf <i>process-id</i>	(Optional) Applies route update advertisement control to only routes introduced from OSPF in this distribution list. <i>process-id</i> specifies an OSPF instance.
rip	(Optional) Applies route update advertisement control to only RIP routes in this distribution list.
static	(Optional) Applies route update advertisement control to only static routes in this distribution list.

Defaults No route update advertisement is configured by default.

Command

Mode Routing process configuration mode

Usage Guide If this command relates to none of optional parameters, route update advertisement control applies to all interfaces. If this command relates to interface options, route update advertisement control applies to only the specified interface. If this command relates to other route process parameters, route update advertisement control applies to only the specific route process.

Configuration Examples The following example advertises only the 192.168.12.0/24 route.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# network 200.4.4.0
Orion_B54Q (config-router)# network 192.168.12.0
Orion_B54Q (config-router)# distribute-list 10 out
Orion_B54Q (config-router)# version 2
Orion_B54Q (config-router)#access-list 10 permit 192.168.12.0 0.0.0.255
```

Related Commands

Command	Description
---------	-------------

access-list	Defines the ACL rule.
prefix-list	Defines the prefix list.
redistribute	Configures route redistribution.

Platform N/A
Description

1.9 enable mib-binding

Use this command to bind a MIB with a specified RIP instance. Use the **no** form of this command to restore the default setting

enable mib-binding
no enable mib-binding

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, the MIB is bound with the RIP instance of the default VRF.

Command

Mode Routing process configuration mode.

Usage Guide As RIP MIB does not have RIP instance information, you can only operate only one RIP instance using SNMP. By default, RIP MIB is bound with the RIP instance of the default VRF. You can only operate this RIP instance. If you want to operate another RIP instance of a specified VRF through SNMP, you can use this command to bind the MIB with this instance.

Configuration Examples The following example operates the RIP instance of a specified VRF, vpn1.

```
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router-af)# enable mib-binding
```

Related Commands	Command	Description
	show ip rip	Displays the global configuration of RIP.

Platform N/A
Description

1.10 exit-address-family

Use this command to exit the address family configuration mode

exit-address-family

Parameter Description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>	Parameter	Description	N/A	N/A
Parameter	Description				
N/A	N/A				
Defaults	N/A				
Command Mode	Address family configuration mode				
Usage Guide	Use this command to exit the address family configuration mode. The abbreviation of this command is exit.				
Configuration Examples	The following example enters or exits the address family configuration mode. <pre>Orion_B54Q(config-router)# address-family ipv4 vrf vpn1 Orion_B54Q(config-router-af)# exit-address-family</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>address-family</td> <td>Enters the address family configuration sub-mode.</td> </tr> </tbody> </table>	Command	Description	address-family	Enters the address family configuration sub-mode.
Command	Description				
address-family	Enters the address family configuration sub-mode.				
Platform Description	N/A				

1.11 fast-reroute

Use this command to enable the RIP FRR (Fast Reroute) function for the device. Use the **no** form of this command to restore the default setting.

fast-reroute route-map *route-map-name*
no fast-reroute

Parameter Description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>route-map-name</i></td> <td>Specifies the backup path through the route map.</td> </tr> </tbody> </table>	Parameter	Description	<i>route-map-name</i>	Specifies the backup path through the route map.
Parameter	Description				
<i>route-map-name</i>	Specifies the backup path through the route map.				

Defaults This function is disabled by default.

Command

Mode Routing process configuration mode

Usage Guide Use the **route-map** command to specify the backup path for the matched routes. It is recommended to enable the BFD function when the RIP fast reroute function is enabled. BFD allows the device to detect the link fault faster, so as to reduce the interruption time. In the scenario where the port is up/down, it is recommended to configure **carrier-delay 0** in interface configuration mode to achieve the fastest switchover speed, reducing the interruption time. Currently, the restrictions of the RIP FRR are as follows:

Only one backup next hop is generated for each route.
 The backup next hop is not generated for the ECMP route.

Configuration Examples The following example enables FRR for RIP instance 1 and associates route map *fast reroute*.

```
Orion_B54Q(config)# route-map fast-reroute
match interface gigabitEthernet 0/2
set fast-reroute backup-interface GigabitEthernet 0/1 backup-next-hop
192.168.1.1
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# fast-reroute route-map fast-reroute
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

1.12 ip rip authentication key-chain

Use this command to enable RIP authentication and specify the keychain used for RIP authentication. Use the **no** form of this command to restore the default setting.

ip rip authentication key-chain *name-of-keychain*

no ip rip authentication key-chain

Parameter Description

Parameter	Description
<i>name-of-keychain</i>	Indicates the name of the keychain, which specifies the keychain used for RIP authentication.

Defaults

The keychain is not associated by default.

Command

Mode

Interface configuration mode

Usage Guide

If the keychain is specified in the interface configuration, use the key chain global configuration command to define the keychain. Otherwise, RIP data packet authentication fails.
 RIPv2 instead of RIPv1 supports authentication of the RIP data packet.

Configuration Examples

The following example enables RIP authentication on the fastEthernet 0/1 with the associated keychain ripchain.

```
Orion_B54Q (config)#interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)#ip rip authentication key-chain
ripchain
```

Meanwhile, use the **key chain** command to define this keychain in global configuration mode.

```
Orion_B54Q(config)#key chain ripchain
```

```
Orion_B54Q(config-keychain)#key 1
Orion_B54Q(config-keychain-key)#key-string Hello
```

Related Commands

Command	Description
ip rip authentication mode	Defines the RIP authentication mode.
ip rip authentication text-password	Enables RIP authentication, and sets the password string of RIP plaintext authentication. RIP data packet authentication is supported only by RIPv2.
ip rip receive version	Defines the version of RIP packets received on the interface.
ip rip send version	Defines the version of RIP packets sent on the interface.
key chain	Defines the keychain and enters keychain configuration mode.

Platform N/A

Description

1.13 ip rip authentication mode

Use this command to define the RIP authentication mode. Use the **no** form of this command to restore the default setting.

ip rip authentication mode { text | md5 }

no ip rip authentication mode

Parameter Description

Parameter	Description
text	Configures RIP authentication as plaintext authentication.
md5	Configures RIP authentication as MD5 authentication.

Defaults It is plaintext authentication by default.

Command

Mode Interface configuration mode

Usage Guide

During the RIP authentication configuration process, the RIP authentication modes of all devices requiring exchange of RIP routing information must be the same. Otherwise, RIP packet exchange will fail.

If the plaintext authentication mode is adopted, but the password string of the plaintext authentication or the associated keychain is not configured, no authentication occurs. In the same way, if the MD5 authentication mode is adopted, but the associated keychain is not configured, no authentication occurs.

RIPv2 instead of RIPv1 supports authentication of the RIP data packet.

Configuration Examples The following example configures the RIP authentication mode on the fastEthernet 0/1 as MD5.

```
Orion_B54Q (config)#interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# ip rip authentication mode md5
```

Related Commands

Command	Description
ip rip authentication key-chain	Enables the RIP authentication mode and specifies the keychain used for RIP authentication. Only RIPv2 supports authentication of the RIP data packet.
ip rip authentication text-password	Enables the RIP authentication mode, and sets the password string of RIP plaintext authentication. Only RIPv2 supports authentication of the RIP data packet.
key chain	Defines the keychain and enters the keychain configuration mode

Platform N/A

Description

1.14 ip rip authentication text-password

Use this command to enable RIP authentication and set the password string of RIP plaintext authentication. Use the **no** form of this command to restore the default setting.

ip rip authentication text-password [0 | 7] password-string

no ip rip authentication text-password

Parameter Description

Parameter	Description
0	Specifies that the key is displayed as plaintext.
7	Specifies that the key is displayed as cipher text.
<i>password-string</i>	Indicates the password string of the plaintext authentication, in the length of 1-16 bytes.

Defaults No password string of RIP plaintext authentication is configured by default.

Command

Mode Interface configuration mode

Usage Guide

This command works only in plaintext authentication mode. To enable the RIP plaintext authentication function, use this command to configure the corresponding password string, or use the associated key chain to obtain the password string. The latter takes the precedence over the former one. RIPv1 does not support RIP authentication but RIPv2 does.

Configuration Examples The following example enables the RIP plaintext authentication on fastEthernet 0/1 and sets the password string to hello.

```
Orion_B54Q(config)#interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip rip authentication text-
password hello
```

Related Commands

Command	Description
ip rip authentication mode	Defines the RIP authentication mode.
ip rip authentication key-chain	Enables the RIP authentication mode and specifies the keychain used for RIP authentication. Only RIPv2 supports authentication.

Platform Description N/A

1.15 ip rip bfd

Use the `ip rip bfd [disable]` command to configure the specified interface running RIP to enable or disable link detection using the BFD. Use the `no` form of this command to restore the default setting.

ip rip bfd [disable]
no ip rip bfd

Parameter Description

Parameter	Description
disable	Disables the specified interface running RIP and uses the BFD mechanism to perform link detection.

Defaults Interfaces running RIP are not configured by default. The BFD configuration in RIP process configuration mode is a reference.

Command Mode

Interface configuration mode

Usage Guide

The priority of the interface is higher that of the `bfd all-interfaces` command in process configuration mode. You can use the `ip rip bfd` command to enable the BFD to perform link detection on the specified interface according to the actual environment or use the `bfd all-interfaces` command to configure all interfaces running RIP and enable the BFD to perform link detection. In addition, you can use the `ip rip bfd disable` command to disable the BFD detection function on the specified interface.

Configuration Examples

N/A

Related

Command	Description
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Commands	
route ip	Enables the RIP routing process and enters the routing process configuration mode.
bdf all-interfaces	Configures all interfaces running RIP to use the BFD to perform link detection.

Platform N/A

Description

1.16 ip rip default-information

Use this command to advertise the default route through a RIP interface. Use the **no** form of this command to restore the default setting.

ip rip default-information { **only** | **originate** } [**metric** *metric-value*]

no ip rip default-information

Parameter Description	Parameter	Description
	only	Notifies the default route rather than other routes.
	originate	Notifies the default route and other routes.
	metric <i>metric-value</i>	Specifies the metric value of the default route, in the range from 1 to 15.

Defaults No default route is configured by default. The default metric value is 1.

Command

Mode Interface configuration mode

Usage Guide After you configure this command on a specified interface, a default route is generated and notified through the interface. If the **ip rip default-information** command of the interface and the **default-information originate** command of the RIP process are configured at the same time, only the default route of the interface is advertised.

- ❗ RIP will no longer learn the default route notified by the neighbor if any interface is configured with the **ip rip default-information** command.

Configuration Examples The following example creates a default route which is notified on ethernet0/1 only.

```
Orion_B54Q(config)#interface ethernet 0/1
Orion_B54Q(config-if-Ethernet 0/1)#ip rip default-information only
```

Related Commands	Command	Description
	default-information originate	Generates a default route in the RIP process.

Platform N/A

Description

1.17 ip rip receive enable

Use this command to enable RIP to receive the RIP data package on a specified interface. Use the **no** form of this command to restore the default setting.

ip rip receive enable
no ip rip receive enable

Parameter Description	Parameter	Description
	N/A	N/A

Defaults RIP packages can be received through the interface by default.

Command

Mode Interface configuration mode

Usage Guide To prevent an interface from receiving RIP packets, use the no form of this command in interface configuration mode. This command works on interfaces configured with this command. You can use the **default** form of this command to enable the interface to receive the RIP data package.

Configuration Examples The following example prohibits receiving RIP data packages on fastEthernet 0/1.

```
Orion_B54Q (config)# interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# no ip rip receive enable
```

Related Commands	Command	Description
	ip rip send enable	Enables or disables the interface to send RIP data packages.
	passive-interface	Configures a passive RIP interface.

Platform N/A
Description

1.18 ip rip receive version

Use this command to define the version of RIP packets received on an interface. Use the **no** form of this command to restore the default setting.

ip rip receive version [1] [2]
no ip rip receive version

Parameter Description	Parameter	Description
	1	(Optional) Receives only RIPv1 packets.

2	(Optional) Receives only RIPv2 packets.
----------	---

Defaults The default behavior depends on the configuration with the version command.

Command

Mode Interface configuration mode

Usage Guide This command overwrites the default configuration of the **version** command. It affects only RIP packet receiving through the interface and allows RIPv1 and RIPv2 packets to be received on the interface at the same time. If the command is configured without parameters, data package receiving depends on the configuration of the version.

Configuration Examples The following example enables receiving both RIPv1 and RIPv2 data packages.

```
Orion_B54Q (config)#interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# ip rip receive version 1 2
```

Related Commands

Command	Description
version	Defines the default version of the RIP packets received/sent on the interface.

Platform N/A

Description

1.19 ip rip send enable

Use this command to enable RIP to send a RIP data package on a specified interface. Use the **no** form of this command to restore the default setting.

- ip rip send enable**
- no ip rip send enable**

Parameter Description

Parameter	Description
N/A	N/A

Defaults RIP packages can be sent through the interface by default.

Command

Mode Interface configuration mode

Usage Guide To prevent an interface from sending RIP packets, use the **no** form of this command in interface configuration mode. This command works on interfaces configured with this command. You can use the **default** form of this command to enable the interface to send the RIP data package.

Configuration Examples The following example prohibits sending RIP data packages on fastEthernet 0/1.

```
Orion_B54Q (config)# interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# no ip rip send enable
```

Related Commands

Command	Description
ip rip receive enable	Enables or disables receiving RIP packets on the interface.
passive-interface	Configures a passive RIP interface.

Platform N/A
Description

1.20 ip rip send supernet-routes

Use this command to enable RIP to send the supernet route on a specified interface. Use the **no** form of this command to disable this function.

ip rip send supernet-routes
no ip rip send supernet-routes

Parameter Description

Parameter	Description
N/A	N/A

Defaults This function is enabled by default.

Command

Mode Interface configuration mode

Usage Guide

When the RIPv1 router monitors a RIPv2 router response packet and if the supernet routing information is monitored, incorrect route information is learned because the RIPv1 ignores the subnet mask of the routing information. In this case, you are advised to use the no form of this command on the RIPv2 router to disable advertising the supernet route on the corresponding interface. This command works only on interfaces configured with this command.

- This command is only valid upon sending the RIPv2 packets on the interface and it is used to control sending the supernet route.

Configuration Examples

The following example disables sending RIP supernet routes on the fastEthernet 0/1 interface.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# no ip rip send supernet-routes
```

Related Commands

Command	Description
version	Defines the RIP version
ip rip send enable	Enables or disables sending the RIP package on the interface.

Platform N/A

Description

1.21 ip rip send version

Use this command to define the version of the RIP packets sent on the interface. Use the **no** form of this command to restore the default setting.

ip rip send version [1] [2]

no ip rip send version

Parameter Description

Parameter	Description
1	(Optional) Receives only RIPv1 packets.
2	(Optional) Receives only RIPv2 packets.

Defaults

The default behavior depends on the configuration with the version command.

Command**Mode**

Interface configuration mode

Usage Guide

This command overwrites the default configuration of the **version** command. It affects only RIP packet sending through the interface and allows RIPv1 and RIPv2 packages sent on the interface at the same time. If the command is configured without parameters, package receiving depends on the configuration of the version.

Configuration Examples

The following example enables sending both RIPv1 and RIPv2 packages on the fastEthernet 0/1 interface.

```
Orion_B54Q (config)# interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# ip rip send version 1 2
```

Related Commands

Command	Description
version	Defines the default version of the RIP packets received/sent on the interfaces.

Platform

N/A

Description

1.22 ip rip split-horizon

Use this command to enable split horizon. Use the **no** form of this command to disable this function.

ip rip split-horizon [poisoned-reverse]

no ip rip split-horizon [poisoned-reverse]

Parameter

Parameter	Description
-----------	-------------

Description	
	poisoned-reverse (Optional) Enables split horizon with poisoned reverse.

Defaults This function is enabled by default.

Command

Mode Interface configuration mode

Usage Guide When multiple devices are connected to the IP broadcast network and run a distance vector routing protocol, the split horizon mechanism is required to prevent loop. The split horizon prevents the device from advertising routing information from the interface that learns that information, which optimizes routing information exchange between multiple devices.

For non-broadcast multi-path access networks (such as frame relay and X.25), split horizon may cause some devices to be unable to learn all routing information. Split horizon may need to be disabled in this case. If an interface is configured the secondary IP address, attentions shall be paid also for split horizon.

If the **poisoned-reverse** parameter is configured, split horizon with poisoned reverse is enabled. In this case, devices still advertise the route information through the interface from which the route information is learned. However, the metric value of the route information is set to unreachable. The RIP routing protocol is a distance vector routing protocol, and the split horizon issue shall be cautioned in practical applications. If it is unsure whether split horizon is enabled on the interface, use the show ip rip command to judge. This function makes no influence on the neighbor defined with the **neighbor** command.

Configuration Examples The following example disables the RIP split horizon function on the interface fastethernet 0/0.

```
Orion_B54Q (config)# interface fastethernet 0/0
Orion_B54Q (config-if)# no ip rip split-horizon
```

Related Commands	Command	Description
	neighbor (RIP)	Defines the IP address of the neighbor of RIP.
	validate-update-source	Enables the source address authentication of the RIP route update message.

Platform N/A

Description

1.23 ip rip summary-address

Use this command to configure port-level convergence through an interface. Use the **no** form of this command to disable this function.

ip rip summary-address *ip-address ip-network-mask*

no ip rip summary-address *ip-address ip-network-mask*

Parameter	Parameter	Description
------------------	------------------	--------------------

Description	<i>ip-address</i>	Indicates the IP addresses to be converged.
	<i>ip-network-mask</i>	Indicates the subnet mask of the specified IP address for route convergence.

Defaults The RIP routes are automatically converged to the classful network edge by default.

Command

Mode Interface configuration mode

Usage Guide The **ip rip summary-address** command converges an IP address or a subnet on a specified port. RIP routes are automatically converged to the classful network edge. The classful subnet can be configured through only port convergence.

- The summary range configured by this command cannot be a super class network, that is, the configured mask length is greater than or equal to the natural mask length of the network.

Configuration Examples The following example disables the automatic route convergence function of RIPv2. Interface convergence is configured so that fastEthernet 0/1 advertises the converged route 172.16.0.0/16.

```
Orion_B54Q (config)# interface fastEthernet 0/1
Orion_B54Q (config-if-FastEthernet 0/1)# ip rip summary-address 172.16.0.0
255.255.0.0
Orion_B54Q (config-if-FastEthernet 0/1)# ip address 172.16.1.1
255.255.255.0
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# network 172.16.0.0
Orion_B54Q (config-router)# version 2
Orion_B54Q (config-router)# no auto-summary
```

Related Commands	Command	Description
	auto-summary	Enables the automatic convergence of RIP routes.

Platform N/A

Description

1.24 ip rip triggered

Use this command to enable triggered RIP based on links. Use the **no** form of this command to restore the default setting.

- ip rip triggered**
- ip rip triggered retransmit-timer timer**
- ip rip triggered retransmit-count count**
- no ip rip triggered**

no ip rip triggered retransmit-timer
no ip rip triggered retransmit-count

Parameter Description

Parameter	Description
retransmit-timer <i>timer</i>	Configures the interval at which the Update Request and Update Response packets are retransmitted. The range is from 1 to 3,600. The unit is second. The default is five.
retransmit-count <i>count</i>	Configures the maximum times that the Update Request and Update Response packets are retransmitted. The range is from 1 to 3600. The default is 36.

Defaults This function is disabled by default.

Command

Mode Interface configuration mode

Usage Guide

Triggered RIP (TRIP) is the extension of RIP on the wide area network (WAN), mainly used for demand-based links.

With the TRIP function enabled, RIP no longer sends route updates periodically and sends route updates to the WAN interface only if:

- Update Request packets are received.
- RIP routing information is changed.
- Interface state is changed.
- The router is started.

As periodical RIP update is disabled, the confirmation and retransmission mechanism is required to ensure that update packets are sent and received successfully over the WAN. The **retransmit-timer** and **retransmit-count** commands can be used to specify the retransmission interval and maximum retransmission times for request and update packets.

-
- ⚠ The function can be enabled in the case of the following conditions: a) The interface has only one neighbor. b) There are multiple neighbors but they interact information using unicast packets. You are advised to enable the function for link layer protocols such as PPP, frame relay, and X.25.
 - ⚠ You are advised to enable split horizon with poison reverse on the interface enabled with the function; otherwise invalid routing information might be left.
 - ⚠ Make sure that the function is enabled on all routers on the same link; otherwise the function will be invalid and the routing information cannot be exchanged correctly.
 - ⚠ The function cannot be enabled at the same time with BFD and RIP functions.
 - ⚠ To enable the function, make sure that the RIP configuration is the same on both ends of the link, such as RIP authentication and the RIP version supported by the interface.
 - ⚠ If this function is enabled on this interface, the source address of packets on this interface will be checked no matter whether the source IP address verification function (validate-update-source) is enabled.
-

Configuration Examples The following example enables TRIP and sets the retransmission interval and maximum retransmission time to 10 seconds and 18 respectively for Update Request and Update Response packets.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip rip triggered
Orion_B54Q(config-if-FastEthernet 0/1)# ip rip triggered retransmit-timer
10
Orion_B54Q(config-if-FastEthernet 0/1)# ip rip triggered retransmit-count
18
```

Related Commands

Command	Description
show ip rip database	Displays the summarized routing information of the RIP database.
show ip rip interface	Displays the RIP interface information.
ip rip split-horizon	Configures RIP split horizon.

Platform N/A
Description

1.25 ip rip v2-broadcast

Use this command to send RIPv2 packets in broadcast rather than multicast mode. Use the **no** form of this command to restore the default setting.

ip rip v2-broadcast
no ip rip v2-broadcast

Parameter Description

Parameter	Description
N/A	N/A

Defaults The default behavior depends on the configuration of the version command.

Command

Mode Interface configuration mode

Usage Guide

This command overwrites the default of the **version** command. This command affects only sending RIP packets on the interface. This command allows RIPv1 and RIPv2 packages sent on the interface simultaneously. If this command is configured without parameters, package receiving depends on the version setting.

Configuration Examples

The following example sends RIPv2 packets in broadcast mode on the fastEthernet 0/1 interface.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# no ip rip split-horizon
```


Related Commands

Command	Description
version	Defines the default version of the RIP packets received and sent on the interface.

Platform

N/A

Description

1.26 neighbor

Use this command to define the IP address of a RIP neighbor. Use the **no** form of this command to restore the default setting.

neighbor *ip-address*

no neighbor *ip-address*

Parameter Description

Parameter	Description
<i>ip-address</i>	Indicates the IP address of the neighbor. The IP address must be that of the network connected to the local device.

Defaults

The neighbor is not defined by default.

Command

Mode

Routing process configuration mode

Usage Guide

By default, RIPv1 uses the IP broadcast address (255.255.255.255) to advertise routing information, and RIPv2 uses the multicast address 224.0.0.9 to do so. If you do not want to allow all the devices on the broadcast network or non-broadcast multi-path access network to receive routing information, use the **passive-interface** command to configure related interfaces as passive interfaces and then define only some neighbors who can receive the routing information. This command has no impact on the receiving of RIP information. The passive interface is configured. No request packet is sent after the interface is enabled.

Configuration Examples

The following example creates a VRF with the name of vpn1 and creates its RIP instance.

```

Orion_B54Q(config)# ip vrf vpn1
Orion_B54Q(config-vrf)# exit
Orion_B54Q(config)# interface fastEthernet 1/0
Orion_B54Q(config-if-FastEthernet 0/1)# ip vrf forwarding vpn1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 192.168.1.1
255.255.255.0
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router)# network 192.168.1.0
Orion_B54Q(config-router)# exit-address-family
    
```

Related Commands	Command	Description
	passive-interface	Configures the interface as a passive interface.

Platform N/A
Description

1.27 network

Use this command to define the list of networks to be advertised in the RIP routing process. Use the **no** form of this command to delete the defined network.

network *network-number* [*wildcard*]

no network *network-number* [*wildcard*]

Parameter Description	Parameter	Description
	<i>network-number</i>	Indicates the network number of the directly-connected network. The network number is a natural one. All interfaces whose IP addresses belong to that natural network can send/receive RIP packages.
	<i>wildcard</i>	Defines the IP address comparing bit: 0 refers to accurate matching, and 1 refers to no comparison.

Defaults N/A

Command

Mode Routing process configuration mode

Usage Guide The *network-number* and *wildcard* parameters can be configured simultaneously to enable the IP address of the interface within the IP address range to join RIP running. Without the *wildcard* parameter, NOS make the interface IP address within the classful address range join the RIP running. Only when the IP address of an interface is in the network list defined by RIP, RIP route update packets can be received and sent on the interface.

Configuration Examples The following example defines two network numbers associated with RIP and allows the interface IP address between 192.168.12.0/24 and 172.16.0.0/24 to join RIP running.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# network 192.168.12.0
Orion_B54Q (config-router)# network 172.16.0.0 0.0.0.255
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

1.28 offset-list

Use this command to increase the metric value of received or sent RIP routes. Use the **no** form of this command to restore the default setting.

offset-list { *access-list-number* | *name* } { **in** | **out** } *offset* [*interface-type interface-number*]

no offset-list { *access-list-number* | *name* } { **in** | **out** } *offset* [*interface-type interface-number*]

Parameter Description

Parameter	Description
<i>access-list-number</i> <i>name</i>	Specifies the ACL.
in	Modifies the metric of the received routes using the ACL.
out	Modifies the metric of the sent routes using the ACL.
<i>offset</i>	Indicates the offset of changed metric values. The value is in the range from 0 to16.
<i>interface-type</i>	Applies the ACL to a specified interface.
<i>interface-number</i>	Specifies the interface number.

Defaults No offset is specified by default.

Command

Mode Routing process configuration mode

Usage Guide If a RIP route matches against both the offset-list of the specified interface and the global offset-list, it will increase the metric value of the offset-list of the specified interface.

Configuration Examples The following example increases the metric of the RIP routes by 7 in the range specified by ACL 7.

```
Orion_B54Q (config-router)# offset-list 7 out 7
```

The following example increases the metric of the RIP routes by 7 in the range specified by ACL 7 and learned by fastethernet 0/1.

```
Orion_B54Q (config-router)# offset-list 8 in 7 fastethernet 0/1
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.29 output-delay

Use this command to modify the delay to send RIP update packets. Use the **no** form of this command to restore the default setting.

output-delay *delay*

no output-delay

Parameter Description	Parameter	Description
	<i>delay</i>	Sets the delay to send RIP update packets, in the range from 8 to 50 in the unit of milliseconds.

Defaults No sending delay is configured by default.

Command

Mode Routing process configuration mode

Usage Guide In normal cases, the size of a RIP update packet is 512 bytes including 25 routes. If the number of updated routes is greater than 25, update packets will be sent through multiple routes. Note that the update packets should be sent as fast as possible.

However, when a high-speed device sends a large number of packets to a low-speed device, the low-speed device may not process all the packets timely, resulting in packet loss. In this case, you can use this command to increase the delay to send packets on the high-speed device so that the low-speed device can process all the update packets.

Configuration Examples The following example sets the delay to send RIP update packets to 30 milliseconds.

```
Orion_B54Q(config)# router rip
Orion_B54Q(config-router)# output-delay 30
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

1.30 passive-interface

Use this command to disable the function of sending update packets on an interface. Use the **no** form of this command to restore the default setting.

```
passive-interface { default | interface-type interface-num }
no passive-interface { default | interface-type interface-num }
```

Parameter Description	Parameter	Description
	default	Sets all interfaces to the passive interfaces.
	<i>interface-type interface-num</i>	Indicates the interface type and number.

Defaults Interfaces are set to the non passive interfaces by default.

Command

Mode Routing process configuration mode

Usage Guide The **passive-interface default** command sets all interfaces to the passive interfaces. You can use **no passive-interface interface-type interface-num** command to set specified interfaces as non-passive interfaces.

After you set an interface to the passive interface, RIP route update packets will no longer be sent but can be received through the interface. In this case, route update packets can be sent to a specified neighbor through the interfaces by using the **neighbor** command. You can use the **ip rip send enable** and **ip rip receive enable** commands to control whether route update packets can be sent or received through the interface.

Configuration Examples The following example sets all interfaces to the passive interfaces and then sets ethernet0/1 to the non-passive interface.

```
Orion_B54Q(config-router)# passive-interface default
Orion_B54Q(config-router)# no passive-interface gigabitEthernet 0/1
```

Related Commands

Command	Description
ip rip receive enable	Enables or disables receiving RIP packets on the interface.
ip rip send enable	Enables or disables sending RIP packets on the interface.

Platform N/A

Description

1.31 redistribute

Use this command to redistribute external routes in route configuration mode. Use the **no** form of this command to restore the default setting.

redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static** } [{ **level-1** | **level-1-2** | **level-2** }] [**match** { **internal** | **external** [1|2] | **nssa-external** [1|2] }] [**metric** *metric-value*] [**route-map** *route-map-name*]

no redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static** } [{ **level-1** | **level-1-2** | **level-2** }] [**match** { **internal** | **external** [1|2] | **nssa-external** [1|2] }] [**metric** *metric-value*] [**route-map** *route-map-name*]

Parameter Description

Parameter	Description
bgp	Is redistributed from bgp.
connected	Is redistributed from a connected route.
isis <i>area-tag</i>	Is redistributed from ISIS and specifies an ISIS instance through area-tag.
ospf <i>process-id</i>	Is redistributed from OSPF and specifies an OSPF instance through process-id. The value is in the range from 1 to 65535.

static	Is redistributed from static routes.
level-1 level-1-2 level-2	Is used when ISIS route redistribution is configured and specifies a route with a specific level for redistribution.
match	Is used when OSPF route redistribution is configured and filters a route with a specific level for redistribution.
metric <i>metric-value</i>	Sets the metric value of the redistributed route and specifies the metric value by using the metric-value parameter. The value is in the range from 1 to 16.
route-map <i>route-map-name</i>	Sets the redistribution filtering rule.

Defaults

By default:

All the routes of the sub types of the instance are redistributed when you configure redistributing OSPF.

The routes of Level-2 sub-types of the instance are redistributed when you configure ISIS redistribution.

All the routes of the protocol are redistributed for other routing protocols.

The metric of the redistributed routes is 1 by default.

The route-map is not associated.

Command**Mode**

Routing process configuration mode

Usage Guide

This command is executed to redistribute external routes to RIP.

It is unnecessary to convert the metric of one routing protocol into that of another routing protocol for route redistribution, since different routing protocols use different metric measurement methods. For RIP, the metric value is calculated based on hop counts; for OSPF, the metric value is calculated based on bandwidths. Therefore, their metrics are not comparable. However, a symbolic metric value must be set for route redistribution. Otherwise, route redistribution will fail.

When you configure ISIS route redistribution without the level parameter, only level-2 routes are redistributed by default. If the redistribution configuration is initialized with the level parameter, then all routes with level configured are redistributed. When the configuration is saved and level 1 and level 2 are configured at the same time, level 1 and level 2 are combined into the level-1-2 parameter to be saved.

When you configure redistribution of OSPF routes without the match parameter, the OSPF routes of all sub types are redistributed by default. Then the first configured match parameter is used as the original one. Only the routes matching the specific type can be redistributed. The no form of this command restores the setting to the default value.

The rule of configuring the no form of the redistribute command is as follows:

1. If the no form of this command specifies certain parameters, the parameters must be restored to the default configuration.
2. If the **no** form of this command does not specify any parameter, the command must be deleted.

Assume that the following configurations are available.

```
redistribute isis 112 level-2
```

You can use the no redistribute isis 112 level-2 command to modify the configuration.

According to the preceding rule, this command only restores the level-2 parameter to the default value. However, level-2 is also the default parameter value. Therefore, the configuration is still be saved as redistribute isis 112 level-2 after you use the no form of this command.

To delete this command, use the following command:

```
no redistribute isis 112
```

▲ The redistribute command cannot redistribute the default route of other protocol to the RIP process. To this end, use the **default-information originate** command.

Configuration Examples The following example redistributes static routes to RIP.

```
Orion_B54Q(config-router)# redistribute static
```

Related Commands

Command	Description
default-metric <i>metric</i>	Sets the default metric of the route to be redistributed.
default-information originate	Generates the default route in the RIP process.

Platform N/A

Description

1.32 router rip

Use this command to create the RIP routing process and enter the routing process configuration mode. Use the **no** form of this command to restore the default setting.

```
router rip
```

```
no router rip
```

Parameter Description

Parameter	Description
N/A	N/A

Defaults No RIP process is running by default.

Command

Mode Global configuration mode

Usage Guide One RIP routing process must be defined with one network number. If a dynamic routing protocol runs on asynchronous lines, configure the **async default routing** command on the asynchronous interface.

Configuration Examples The following example creates the RIP routing process and enters the routing process configuration mode.

```
Orion_B54Q (config)# router rip
Orion_B54Q(config-router)#
```

Related Commands	Command	Description
	network (RIP)	Defines the network number of the RIP process.

Platform N/A
Description

1.33 show ip rip

Use this command to display the RIP process information.

show ip rip [vrf vrf-name]

Parameter Description	Parameter	Description
	vrf vrf-name	(Optional) Displays the RIP information with the specified VRF.

Defaults N/A

Command

Mode Privileged EXEC mode/ Global configuration mode/ Routing process configuration mode

Usage Guide It is used to display the three timers, routing distribution status, routing re-distribution status, interface RIP version, RIP interface and network range, metric, and distance of the RIP process quickly. If the VRF is specified, the name of VRF and VRF ID are displayed.

Configuration Examples The following example displays the basic information of the RIP process such as the update time and management distance.

```
Orion_B54Q#show ip rip
Routing Protocol is "rip"
  Sending updates every 10 seconds, next due in 4 seconds
  Invalid after 20 seconds, flushed after 10 seconds
  Outgoing update filter list for all interface is: not set
  Incoming update filter list for all interface is: not set
  Default redistribution metric is 2
  Redistributing: connected
  Default version control: send version 2, receive version 2
    Interface          Send  Recv
    FastEthernet 0/1    2     2
    FastEthernet 0/2    2     2
  Routing for Networks:
    192.168.26.0 255.255.255.0
    192.168.64.0 255.255.255.0
  Distance: (default is 50)
```

The following example specifies the VRF and displays the corresponding basic information of RIP

instance.

```
Orion_B54Q(config-router)# sh ip rip vrf 1
VRF 1 VRF-id:1
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 4 seconds
  Invalid after 180 seconds, flushed after 120 seconds
  Outgoing update filter list for all interface is: not set
  Incoming update filter list for all interface is: not set
  Default redistribution metric is 1
  Redistributing:
  Default version control: send version 1, receive any version
  Routing for Networks:
  Distance: (default is 120)
```

Related Commands	Command	Description
		N/A

Platform N/A
Description

1.34 show ip rip database

Use this command to display the route summary information in the RIP routing database.

show ip rip database [*vrf vrf-name*] [*network-number network-mask*] [*count*]

no address-family ipv4 vrf vrf-name

Parameter Description	Parameter	Description
		<i>vrf vrf-name</i>
	<i>network-number</i>	(Optional) Indicates the ID of the subnet on which route information is to be displayed.
	<i>network-mask</i>	Indicates the subnet mask. It must be specified if the network number is specified.
	count	(Optional) Displays the abstract of the route statistics in the RIP database.

Defaults N/A

Command

Mode Privileged EXEC mode/ Global configuration mode/ Routing process configuration mode

Usage Guide Only when the related sub-routes are converged, the converged address entries appear in the RIP routing database. When the last sub-route information in the converged address entries becomes

invalid, the converged address information will be deleted from the database.

Configuration Examples

The following example displays all converged address entries in the RIP routing database.

```
Orion_B54Q# show ip rip database
192.168.1.0/24    auto-summary
192.168.1.0/30    directly connected, Loopback 3
192.168.1.8/30    directly connected, FastEthernet 0/1
192.168.121.0/24 auto-summary
192.168.121.0/24 redistributed
[1] via 192.168.2.22, FastEthernet 0/2
192.168.122.0/24 auto-summary
192.168.122.0/24
[1] via 192.168.4.22, Serial 0/1 00:28 permanent
```

The following example displays the converged address entries related with 192.168.121.0/24 in the RIP routing database.

```
Orion_B54Q# show ip rip database 192.168.121.0 255.255.255.0
192.168.121.0/24 redistributed
[1] via 192.168.2.22, FastEthernet 0/1
```

The following example displays the statistical information summary of various routes in the RIP routing database.

```
Orion_B54Q# show ip rip database count
           All      Valid  Invalid
database   5        5       0
auto-summary 5        5       0

connected  1         1       0
rip        4         4       0
```

Related Commands	Command	Description
		show ip rip

Platform N/A
Description

1.35 show ip rip external

Use this command to display the information of the external routes redistributed by the RIP protocol.

```
show ip rip external [ bgp | connected | isis [ process-id ] | ospf process-id | static ] [ vrf vrf-name ]
```

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
bgp	Displays redistributed BGP routes.
connected	Displays redistributed directly-connected routes.
isis <i>process-id</i>	Displays redistributed ISIS routes. The process-id parameter indicates ISIS process ID.
ospf <i>process-id</i>	Displays redistributed OSPF routes. The process-id parameter indicates OSPF process ID. The range is from 1 to 65535.
static	Displays redistributed static routes.
vrf <i>vrf-name</i>	Displays the RIP external route of the specified VRF (optional).

Defaults N/A

Command

Mode Privileged EXEC mode/ Global configuration mode/ Routing process configuration mode

Usage Guide N/A

Configuration Examples The following example displays direct routes redistributed by the RIP process.

```
Orion_B54Q# show ip rip external connected
Protocol connected route:
[connected] 1.0.0.0/8 metric=0
nhop=0.0.0.0, if=2
[connected] 3.0.0.0/8 metric=0
nhop=0.0.0.0, if=16391
[connected] 4.4.0.0/16 metric=0
nhop=0.0.0.0, if=16388
[connected] 5.0.0.0/8 metric=0
nhop=0.0.0.0, if=16386
[connected] 192.168.195.0/24 metric=0
nhop=0.0.0.0, if=1
```

Related Commands	Command	Description
	show ip rip	Displays the information of the currently running routing protocol process.
	ip vrf	Creates a VRF.

Platform N/A

Description

1.36 show ip rip interface

Use this command to display the RIP interface information.

```
show ip rip interface [ vrf vrf-name ] [ interface-type interface-number ]
```

Parameter Description

Parameter	Description
<code>vrf vrf-name</code>	Displays the RIP interface of specified VRF (optional).
[<code>interface-type interface-number</code>]	Displays the specified interface type and interface number (optional).

Defaults

N/A

Command**Mode**

Privileged EXEC mode/ Global configuration mode/ Routing process configuration mode

Usage Guide

This command is used to display the information about RIP interfaces. If no RIP interface exists, no information is displayed.

Configuration Examples

The following example displays the RIP interface information.

```
Orion_B54Q# show ip rip interface
FastEthernet 0/1 is up, line protocol is up
Routing Protocol: RIP
Receive RIPv2 packets only
Send RIPv2 packets only
Recv RIP packet total: 0
Send RIP packet total: 3
Passive interface: Disabled
Split Horizon with Poisoned Reverse: Enabled
Triggered RIP Enabled:
Retransmit-timer: 5, Retransmit-count: 36
V2 Broadcast: Disabled
Multicast registe: Registered
Interface Summary Rip:
Not Configured
Authentication mode: Text
Authentication key-chain: ripk1
Authentication text-password: Orion_B54Q
Default-information: only, metric 5
IP interface address:
192.168.64.100/24, next update due in 14 seconds
2.2.1.1/24, next update due in 24 seconds
    neighbor 2.2.1.6, next update due in 3 seconds
    neighbor 2.2.1.77, next update due in 13 seconds
2.2.2.57/24, next update due in 16 seconds
```

If the BFD has been configured for RIP, the BFD information is also displayed.

```
Orion_B54Q#show ip rip interface
Serial 0/1 is up, line protocol is up
Routing Protocol: RIP
```

```

Receive RIPv1 and RIPv2 packets
Send RIPv1 packets only
Receive RIP packet: Enabled
Send RIP packet: Enabled
Send RIP supernet routes: Enabled
Recv RIP packet total: 0
Send RIP packet total: 3
Passive interface: Disabled
Split Horizon: Enabled
Triggered RIP Disabled
  BFD: Enabled
  V2 Broadcast: Disabled
  Multicast registe: Registered
  Interface Summary Rip:
    Not Configured
  IP interface address:
    2.2.2.111/24, next update due in 14 seconds
    
```

Related Commands

Command	Description
show ip rip	Displays the information of the currently running routing protocol process.

Platform N/A
Description

1.37 show ip rip peer

Use this command to show the RIP peer information. RIP records a summary for the RIP routing information source learnt (source addresses of RIP route update packets) for the convenience of user monitoring. This routing information source is called RIP neighbor information.

```
show ip rip peer [ ip-address ] [ vrf vrf-name ]
```

Parameter Description

Parameter	Description
<i>ip-address</i>	(Optional) Displays the IP address of a specified RIP neighbor.
vrf <i>vrf-name</i>	(Optional) Displays the RIP interface of a specified VRF.

Defaults N/A

Command

Mode Privileged EXEC mode/ Global configuration mode/ Routing process configuration mode

Usage Guide This command is used to display the RIP neighbor information. If no RIP neighbor exists, no information will be displayed.

Configuration Examples The following example displays the RIP neighbor information.

```
Orion_B54Q# show ip rip peer
Peer 192.168.3.2:
  Local address: 192.168.3.1
  Input interface: GigabitEthernet 0/2
  Peer version: RIPv1
  Received bad packets: 3
  Received bad routes: 0
  BFD session state up
```

Related Commands

Command	Description
show ip rip	Displays the information of the routing protocol process that is running.

Platform N/A

Description

1.38 timers basic

Use this command to adjust the RIP clock. Use the **no** form of this command to restore the default setting.

timers basic *update invalid flush*

no timers basic

Parameter Description

Parameter	Description
<i>update</i>	Indicates the route update time in seconds. The update keyword defines the period at which the device sends route update packets. Each time an update packet is received, the "Invalid" and "Flush" clocks are reset. By default, a route update packet is sent every 30 seconds.
<i>invalid</i>	Indicates the route invalid time in seconds, starting from the last valid update packet. The "invalid" defines the period when the route in the routing table becomes invalid due to no update. The invalid period of route shall be at least three times the route update period. If no update packet is received within the route invalid period, the related route becomes invalid and enters into the "invalid" state. If an update packet is received within the period, the clock resets. By default, the Invalid time is 180 seconds.
<i>flush</i>	Indicates the route flushing time in seconds, starting when a RIP route enters into the invalid status. When the flush time is due, the routes in the invalid status will be cleared out of the routing table.

	The default Flush time is 120 seconds.
--	--

Defaults By default, the update time is 30 seconds, the invalid time is 180 seconds, and the flushing time is 120 seconds.

Command

Mode Routing process configuration mode

Usage Guide Adjusting the above clocks may speed up routing protocol convergence and fault recovery. Devices connected to the same network must have consistent RIP clock values. Adjustment of RIP clocks is not recommended unless otherwise specified.

To check the current RIP clock parameters, use the **show ip rip** command.

▲ If you set the clock to a small value on low-speed links, some risks will be caused because numerous update packets may use up the bandwidth. In general, the clocks can be configured with smaller values on Ethernet or the lines of above 2 Mbit/s to reduce the convergence time of routes.

Configuration Examples The following example enables the RIP update packets that are sent every 10 seconds. If no update packet is received within 30 seconds, related routes become invalid and enter the invalid status. When another 90s elapses, they will be cleared.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# timers basic 10 30 90
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.39 validate-update-source

Use this command to validate the source address of the received RIP route update packet. Use the **no** form of the command to disable this function.

validate-update-source
no validate-update-source

Parameter Description

Parameter	Description
N/A	N/A

Defaults This function is enabled by default.

Command

Mode Routing process configuration mode

Usage Guide You can validate the source address of the RIP route update packet. The validation aims to ensure that the RIP routing process receives only the route update packets from the same IP subnet neighbor.

Disabling split horizon on the interface causes the RIP routing process to enable update message source address validation, no matter whether it has been configured with the **validate-update-source** command in routing process configuration mode.

In addition, for the ip unnumbered interface, the RIP routing process does not implement update message source address validation, no matter whether it has been configured with the command **validate-update-source**.

Configuration Examples The following example disables verification of the source IP address of the update packet.

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# no validate-update-source
```

Related Commands

Command	Description
ip split-horizon	Enables split horizon.
ip unnumbered	Defines the IP unnumbered interface.
neighbor (RIP)	Defines the IP address of a RIP neighbor.

Platform N/A
Description

1.40 version

Use this command to define the RIP version of a device. Use the **no** form of this command to restore the default setting.

```
version { 1 | 2 }  

no version
```

Parameter Description

Parameter	Description
1	Defines the RIP version 1.
2	Defines the RIP version 2.

Defaults The route update packets of RIPv1 and are received by default, but only the RIPv1 route update packets are sent.

Command

Mode Routing process configuration mode

Usage Guide This command defines the RIP version running on the device. It is possible to redefine the messages of which RIP version are processed on every interface by using the **ip rip receive version** and **ip rip send version** commands.

Configuration The following example configures the RIP version as version 2.

n Examples

```
Orion_B54Q (config)# router rip
Orion_B54Q (config-router)# version 2
```

**Related
Commands**

Command	Description
ip rip receive version	Defines the version of RIP packets received on the interface.
ip rip send version	Defines the version of RIP packets sent on the interface.
show ip rip	Displays RIP information.

**Platform
Description**

N/A

2 OSPFv2 Commands

2.1 area

Use this command to configure the specified OSPF area. Use the **no** form of this command to restore the default setting.

area *area-id*

no area *area-id*

Parameter Description

Parameter	Description
<i>area-id</i>	ID of the OSPF area. The value can be a decimal integer or an IP address.

Defaults No OSPF area is configured by default.

Command

Mode Routing process configuration mode

Usage Guide Use the no form of this command to remove the specified OSPF area and its configuration, including the area-based **area authentication**, **area default-cost**, **area filter-list**, and **area nssa** commands.

- Do not remove the OSPF area configuration under the following conditions:
- Virtual links exist in the backbone area. The virtual links must be removed at first.
- The corresponding network area command exists in any area. All network segment commands added to an area must be removed at first.

Configuration Examples The following example removes the configuration of OSPF area 2.

```
Orion_B54Q(config)# router ospf 2
Orion_B54Q(config-router)# no area 2
```

Related Commands

Command	Description
network area	Defines the interface where OSPF runs and the belonging area of the interface.

Platform Description N/A

2.2 area authentication

Use this command to enable OSPF area authentication. Use the **no** form of this command to restore

the default setting.

area *area-id* authentication [message-digest]

no area *area-id* authentication

Parameter Description

Parameter	Description
<i>area-id</i>	Specifies ID of the area enabled with OSPF. The value can be a decimal integer or an IP address.
message-digest	(Optional) Enables MD5 (message digest 5) authentication mode.

Defaults

No authentication is enabled by default.

Command

Mode

Routing process configuration mode

Usage Guide

The NOS software supports three authentication types:

- 1) 0, no authentication. The authentication type in the OSPF packet is 0 when this command is not executed to enable OSPF authentication.
- 2) 1, plain text authentication mode. When this command is configured, the message-digest option is not used.
- 3) 2, MD5 authentication mode. When this command is configured, the message-digest option is used.

All devices in the same OSPF area must use the same authentication type. If authentication is enabled, the authentication password must be configured on an interface connecting neighbors. You can use the **ip ospf authentication-key** command to configure the plain text authentication password, and the **ip ospf message-digest-key** command to configure the MD5 authentication password in interface configuration mode.

Configuration Examples

The following example uses MD5 authentication and the authentication password backbone in area 0 (backbone area) of the OSPF routing process.

```

Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 192.168.12.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf message-digest-key 1 md5
backbone
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# network 192.168.12.0 0.0.0.255 area 0
Orion_B54Q(config-router)# area 0 authentication message-digest
    
```

Related Commands

Command	Description
ip ospf authentication-key	Defines the OSPF plain text authentication password.
ip ospf message-digest-key	Defines the OSPF MD5 authentication password.
area virtual-link	Defines a virtual link.

Platform

N/A

Description

2.3 area default-cost

Use this command to define the cost (OSPF metric) of the default aggregate route advertised to the stub area or not-so-stubby area (NSSA) in routing process configuration mode. Use the **no** form of this command to restore the default setting.

area *area-id* **default-cost** *cost*

no area *area-id* **default-cost**

Parameter Description

Parameter	Description
<i>area-id</i>	ID of the stub area or NSSA
<i>Cost</i>	Cost of the default aggregate route advertised to the stub area or NSSA. The range is from 0 to 16777215.

Defaults The default is 1.

Command

Mode Routing process configuration mode

Usage Guide This command takes effect only on the Area Border Router (ABR) of the stub area or the ABR/Autonomous System Border Router (ASBR) of the NSSA. The ABR can advertise a Link State Advertisement (LSA) indicating the default route in the stub area. The ABR/ASBR can advertise an LSA indicating the default route in the NSSA. You can use the **area default-cost** command to modify the LSA cost.

Configuration Examples The following example sets the cost of the default aggregate route to 50.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# network 172.16.0.0 0.0.255.255 area 0
Orion_B54Q(config-router)#network 192.168.12.0 0.0.0.255 area 1
Orion_B54Q(config-router)# area 1 stub
Orion_B54Q(config-router)# area 1 default-cost 50
```

Related Commands

Command	Description
area stub	Sets an OSPF area as a stub area.
area nssa	Sets an OSPF area as an NSSA.

Platform Description N/A

2.4 area filter-list

Use this command to filter the inter-area routes on the ABR. Use the **no** form of this command to restore the default setting.

area *area-id* **filter-list** { **access** *acl-name* | **prefix** *prefix-name* } { **in** | **out** }

no area *area-id* **filter-list** { **access** *acl-name* | **prefix** *prefix-name* } { **in** | **out** }

Parameter Description	Parameter	Description
	<i>area-id</i>	Area ID
	<i>acl-name</i>	Name of an Access Control List (ACL)
	<i>prefix-name</i>	Prefix-list name
	in out	Applies the ACL rule to the routes incoming/outgoing the area.

Defaults No filtering is configured by default.

Command

Mode Routing process configuration mode

Usage Guide This command can be configured only on an ABR.

You can use this command when it is required to filter the inter-area routes on the ABR.

Configuration Examples The following example sets area 1 to learn only the inter-area routes of 172.22.0.0/8.

```
Orion_B54Q # configure terminal
Orion_B54Q(config)# access-list 1 permit 172.22.0.0/8
Orion_B54Q(config)# router ospf 100
Orion_B54Q(config-router)# area 1 filter-list accesslin
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

2.5 area nssa

Use this command to set an OSPF area as an NSSA in routing process configuration mode. Use the **no** form of this command to delete the NSSA or the NSSA configuration.

area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [*metric value*] [**metric-type** *type*]] [**no-summary**] [**translator** [**stability-interval** *seconds* | **always**]]

no area *area-id* **nssa** [**no-redistribution**] [**default-information-originate** [*metric value*] [**metric-type** *type*]] [**no-summary**] [**translator** [**stability-interval** | **always**]]

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
<i>area-id</i>	NSSAID
no-redistribution	Imports the routing information to a common area other than the NSSA for the NSSA ABR.
default-information originate	Generates and imports the default Type 7 LSA to the NSSA. This option takes effect only on the NSSA ABR or ASBR.
metric value	Sets the metric of the generated default LSA. The range is from 0 to 16777214. The default value is 1.
metric-type type	Sets the type of the generated LSA to N-1 or N-2. The default value is N-2.
no-summary	Prevents the NSSA ABR from sending summary LSAs (Type-3 LSA).
Translator	Configures the translator for the NSSA ABR.
stability-interval seconds	Configures the stability interval in seconds for the NSSA ABR that functions as a translator to change to a non-translator. The range is from 0 to 2147483647. The default value is 40.
Always	Configures that an NSSA ABR always functions as a translator. The NSSA ABR is the backup translator by default.

Defaults No NSSA is defined by default.

Command

Mode Routing process configuration mode

Usage Guide The default-information-originate parameter is used to generate the default Type-7 LSA. However, on the NSSA ABR, the default Type-7 LSA will always be generated; On the ASBR (which is not an ABR at the same time), the default Type-7 LSA is generated only when the default route exists in the routing table.

The no-redistribution parameter prevents the OSPF from advertising the external routes imported with the redistribute command to the NSSA on the ASBR. This option is generally used when the NSSA device is both an ASBR and an ABR.

To reduce the number of LSAs sent to the NSSA, you can configure the no-summary parameter on the ABR to prevent it from advertising summary LSAs (Type-3 LSAs) to the NSSA. In addition, you can use the area default-cost command on the NSSA ABR to configure the cost of the default route advertised to the NSSA. By default, this cost is 1.

If an NSSA has multiple ABRs, the ABR with the greatest ID is selected as the Type-7 or Type-5 translator. To configure that an NSSA ABR always functions as a translator, you can use the translator always parameter. If the translator role of an ABR is taken away by another ABR, the ABR still possesses the conversion capability within stability-interval. If the ABR fails to take back its translator role when stability-interval expires, the LSA that changes from Type-7 to Type-5 will be removed from the autonomous domain.

To avoid route loops, Type-5 LSAs generated from Type-7 convergence will be eliminated immediately after the current device stopped serving as a translator, with no need to wait until the stability-interval expires.

In a same NSSA, you are recommended to configure the **translator always** parameter on only one ABR.

Configuration Examples The following example sets area 1 as an NSSA on all routers of the area.

```
Orion_B54Q(config)#router ospf1
Orion_B54Q(config-router)#network 172.16.0.0 0.0.255.255 area0
Orion_B54Q (config-router)#network 192.168.12.0 0.0.0.255 area 1
Orion_B54Q(config-router)# area1nssa
```

Related Commands

Command	Description
area default-cost	Defines the cost (OSPF metric) of the default aggregate route advertised to the NSSA.

Platform N/A

Description

2.6 area range

Use this command to configure inter-area route aggregation for OSPF. Use the **no** form of this command to delete route aggregation. Use the **no** form with the cost parameter to restore the default metric of the aggregate route, but not delete route aggregation.

```
area area-id range ip-address net-mask [ advertise | not-advertise ] [ cost cost ]
no area area-id range ip-address net-mask [ cost ]
```

Parameter Description

Parameter	Description
<i>area-id</i>	ID of the area where the aggregate route is injected into. The value can be a decimal integer or an IP address.
<i>ip address net-mask</i>	Network segment whose routes are to be aggregated
advertise not-advertise	Whether to advertise the aggregate route
cost cost	Sets the priority of the interface. The range is from 0 to 16777215.

Defaults

No inter-area route aggregation is configured by default.
 The configured aggregation range is advertised by default.
 The default metric of the aggregate route depends on whether the device is compatible with RFC1583. If yes, the default metric is the smallest cost of the aggregate route. If no, the default metric is the largest cost of the aggregate route.

Command

Mode Routing process configuration mode

Usage Guide

This command takes effect only on the ABR to aggregate multiple routes of an area into a route and advertise it to other areas. Route combination occurs only on the border of an area. The devices

inside an area see the specific routing information, but the devices outside the area see only one aggregate route. The advertise and not-advertise options can set whether to advertise the aggregate route for filtering and masking. The aggregate route is advertised by default.

You can use the cost option to set the metric of the aggregate route.

You can define route aggregate in multiple areas to simplify the routes in the whole OSPF routing area. This improves the network forwarding performance, especially in large networks.

The area range of route aggregation is determined according to the longest match when multiple aggregate routes with direct inclusion relationships are configured.

Configuration Examples The following example aggregate the routes of area 1 into a route 172.16.16.0/20.

```
Orion_B54Q(config)#router ospf 1
Orion_B54Q(config-router)#network 172.16.0.0 0.0.15.255area0
Orion_B54Q((config-router)#network 172.16.17.0 0.0.15.255area1
Orion_B54Q(config-router)#arealrange 172.16.16.0 255.255.240.0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.7 area stub

Use this command to set an OSPF area as a stub area or full stub area. Use the **no** form of this command to restore the default setting.

area *area-id* **stub** [**no-summary**]

no area *area-id* **stub** [**no-summary**]

Parameter Description

Parameter	Description
<i>area-id</i>	Stub area ID
no-summary	(Optional) Prevents the ABR from advertising the network summary link to the stub area. Here the stub area is called the full stub area. Only the ABR needs this parameter.

Defaults No stub area is defined by default.

Command

Mode Routing process configuration mode

Usage Guide All devices in the OSPF stub area must be configured with the area stub command. The ABR only sends three types of link state advertisement (LSA) to the stub area: 1) type 1, device LSA; 2) type 2, network LSA; 3) type 3, network summary LSA. For the routing table, the devices in the stub area can learn only the routes inside the OSPF routing domain, including the internal default routes

generated by the ABR.

To configure a full stub area, use the `area stub` command with the `no-summary` keyword on the ABR. The devices in the full stub area can learn only the routes in the local area and the internal default routes generated by the ABR.

Two commands can configure an OSPF area as a stub area: the `area stub` and `area default-cost` commands. All devices connected to the stub area must be configured with the `area stub` command, but the `area default-cost` command can be executed only on the ABR. The `area default-cost` command defines the initial cost (metric) of the internal default route.

Configuration Examples

The following example sets area 1 as the stub area on all devices in area 1.

```
Orion_B54Q(config)# router ospf1
Orion_B54Q(config-router)# network 172.16.0.0 0.0.255.255 area 0
Orion_B54Q (config-router)# network 192.168.12.0 0.0.0.255 area 1
Orion_B54Q(config-router)# area 1 stub
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

2.8 area virtual-link

Use this command to define the OSPF virtual link in routing process configuration mode. Use the `no` form of this command to restore the default setting.

```
area area-id virtual-link router-id [ authentication [ message-digest | null ] ] [ dead-interval seconds ] [ hello-interval seconds ] [ retransmit-interval seconds ] [ transmit-delay seconds ] [ [ authentication-key [ 0|7 ] key ] ] [ [ message-digest-key key-id md5 [ 0|7 ] key ] ]
no area area-id virtual-link router-id [ authentication ] [ dead-interval ] [ hello-interval ] [ retransmit-interval ] [ transmit-delay ] [ [ authentication-key ] ] [ [ message-digest-key key-id ] ]
```

Parameter Description

Parameter	Description
<i>area-id</i>	ID of the OSPF transition area. The value can be a decimal integer or an IP address.
<i>router-id</i>	ID of the router neighboring to the virtual link. It can be viewed with the <code>show ip ospf</code> command.
dead-interval <i>seconds</i>	(Optional) Defines the time to declare neighbor loss in seconds. The range is 0 to 2147483647. This value must be consistent with that of the neighbor.
hello-multiplier	Multiplies <code>dead-interval</code> with <code>hello-interval</code> in the Fast-Hello function.
hello-interval <i>seconds</i>	(Optional) Defines the interval at which the HELLO packet is sent by the OSPF to the virtual link in seconds. The range is from 1 to

	65535. This value must be consistent with that of the neighbor.
retransmit-interval <i>seconds</i>	(Optional) OSPF LSA retransmission interval in seconds. The range is from 0 to 65535. The parameter setting must consider the round-trip time of packets on the link.
transmit-delay <i>seconds</i>	(Optional) OSPF LSA transmission delay in seconds. The range is from 0 to 65535. This value adds the LSA keep alive period. When the LSA keep alive period reaches a threshold, the LSA will be refreshed.
authentication-key [0 7] <i>key</i>	(Optional) Defines the OSPF plain text authentication key. The plain text authentication key between neighbors must be the same. The service password-encryption command enables the key to be displayed in encrypted manner. 0 indicates that the key is displayed in plain text. 7 indicates that the key is displayed in cipher text.
message-digest-key <i>key-id</i> md5 [0 7] <i>key</i>	(Optional) Defines the OSPF MD5 authentication key and key ID. The MD5 authentication key ID and key between neighbors must be the same. The service password-encryption command enables the key to be displayed in encrypted manner. 0 indicates that the key is displayed in plain text. 7 indicates that the key is displayed in cipher text.
Authentication	Sets the authentication type to plain text.
message-digest	Sets the authentication type to MD5.
Null	Sets the authentication type to no authentication.

Defaults

The following are the default values:

dead-interval: 40seconds

hello-interval: 10seconds

retransmit-interval: 5seconds

transmit-delay: 1second

authentication: null

The Fast Hello function is disabled by default.

The other parameters do not have default values.

Command**Mode**

Routing process configuration mode

Usage Guide

A virtual link can connect an area to the backbone area, or another non-backbone area. In the OSPF routing domain, all areas must connect to the backbone area. If an area disconnects from the backbone area, a virtual link to the backbone area is required. Otherwise, the network communication will become abnormal. The virtual link is created between two ABRs. The area that belongs to both ABRs is called the transition area, which can never be a stub area or NSSA. The router-id parameter indicates the ID of OSPF neighbor router and can be displayed with the show ip ospf neighbor command. You can configure the loopback address as the router ID. The area virtual-link command defines only the authentication key for a virtual link. You can use the

area authentication command to enable the OSPF packet authentication in areas connected over the virtual link in routing process configuration mode.

Configuration Examples

The following example sets area 1 as the transition area to establish virtual link with neighbor 2.2.2.2.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# network 172.16.0.0 0.0.15.255 area0
Orion_B54Q(config-router)# network 172.16.17.0 0.0.15.255 area1
Orion_B54Q(config-router)#area1 virtual-link2.2.2.2
```

The following example sets area 1 as the transition area to establish a virtual link with neighbor 1.1.1.1. This virtual link connects area 10 and the backbone area, and works with the OSPF packet authentication inMD5 mode.

```
Orion_B54Q(config)# routerospfl
Orion_B54Q(config-router)# network172.16.17.0 0.0.15.255area1
Orion_B54Q(config-router)# network172.16.252.0 0.0.0.255 area10
Orion_B54Q(config-router)# area 0 authentication message-digest
Orion_B54Q(config-router)# area1virtual-link 1.1.1.1message-digest-
key1md5hello
```

Related Commands

Command	Description
show ip ospf	Displays the OSPF process information, including the router ID.
show ip ospf virtual-links	Monitors information about a virtual link.

Platform N/A

Description

2.9 auto-cost

Use this command to enable the auto-cost function and set the reference bandwidth according to the reference bandwidth. Use the **no** form of this command to restore the default setting.

auto-cost reference-bandwidth ref-bw

no auto-cost reference-bandwidth

Parameter Description

Parameter	Description
<i>ref-bw</i>	Reference bandwidth, in the range from1 to 4294967 Mbps.

Defaults The default is 100Mbps.

Command

Mode Routing process configuration mode

Usage Guide This command sets the reference bandwidth for automatically generating the interface cost. Without the optional parameter, the command enables the auto-cost function with the default reference bandwidth. With the optional parameter, the command enables the auto-cost function with a specified reference bandwidth. Note that the **default auto-cost** command enables the auto-cost function with the default configuration, while and the **no auto-cost** command disables the function. The cost set with the **ip ospf cost** command will replace the auto-cost.

Configuration Examples The following example configures the reference bandwidth as 10 Mbps.

```
Orion_B54Q(config)# routerospfl
Orion_B54Q(config-router)# network172.16.10.0 0.0.0.255 area0
Orion_B54Q(config-router)# auto-costreference-bandwidth10
```

Related Commands	Command	Description
	show ip ospf	Displays the OSPF global configuration information
	ip ospf cost	Sets the cost value of the OSPF interface.
	Bandwidth	Sets the interface bandwidth. This setting does not affect data transmission rate.

Platform N/A
Description

2.10 bdf all-interfaces

Use this command to enable Bidirectional Forwarding Detection (BFD) on all OSPF interfaces. Use the **no** form of this command to restore the default setting.

bdf all-interfaces
no bdf all-interfaces

Parameter Description	Parameter	Description
	N/A	N/A

Defaults BDF is disabled by default.

Command

Mode Routing process configuration mode

Usage Guide OSPF dynamically discovers the neighbors through Hello packets. With the BFD function enabled, one BFD session will be established for the neighbors that match the FULL rules and the status of the neighbors will be detected through the BFD mechanism. Once the BFD neighbor fails, the OSPF will converge with the network immediately.

You can also use the **ip ospf bfd [disable]** command in interface configuration mode to enable or disable the BFD function on the specified interface, which takes precedence over the **bdf all-**

interfaces command in routing process configuration mode.

Configuration Examples N/A

Related Commands	Command	Description
	router ospf	Creates the OSPF routing process and enters routing process configuration mode.
	ip ospf bfd]	Enables the specified interface running OSPF or disabling BFD for link detection.

Platform Description N/A

2.11 capability opaque

Use this command to enable Opaque LSA. Use the **no** form of this command to disable this function.

capability opaque
no capability opaque

Parameter Description	Parameter	Description
	N/A	N/A

Defaults Opaque LSA is enabled by default.

Command Mode Routing process configuration mode.

Usage Guide N/A

Configuration Examples The following example disables Opaque LSA capability.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# no capability opaque
```

Related Commands	Command	Description
	show ip ospf	Displays the global configuration of OSPF.

Platform Description N/A

2.12 clear ip ospf process

Use this command to clear and restart the OSPF instance.

clear ip ospf (process-id) process

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF instance ID. When the ID is specified, the command clears data related to the specified instance and restarts the OSPF instance. When no ID is specified, the command clears data related to all running OSPF instances and restarts all the running OSPF instances.

Defaults The rule recommended in the RFC 1583 is used by default.

Command

Mode Privileged EXEC mode

Usage Guide Resetting the entire OSPF process causes that all neighbors are re-established and OSPF is greatly affected. Therefore, you are prompted to confirm the execution for deliberation.

Configuration Examples The following example clears data of OSPF instance 1 and restarts OSPF instance 1.

```
Orion_B54Q#clearipospflprocess
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

2.13 compatible rfc1583

Use this command to determine the RFC 1583 or RFC 2328 rule for selecting the optimal route among route table several routes to the same destination out of the Autonomous System (AS).

compatible rfc1583

no compatible rfc1583

Parameter Description	Parameter	Description
	N/A	N/A

Defaults The RFC 1583 rule is used by default.

Command

Mode Routing process configuration mode

Usage Guide N/A

Configuration Examples The following example determines the best route with the RFC 2328 rule.

```
Orion_B54Q(config)# routerospf1
Orion_B54Q(config-router)# nocommpatiblerfc1583
```

Related Commands

Command	Description
show ip ospf	Displays the OSPF global configuration information

Platform N/A

Description

2.14 default-information originate

Use this command to generate a default route to be injected into the OSPF routing domain in routing process configuration mode. Use the **no** form of this command to restore the default setting.

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

no default-information originate [**always**] [**metric**] [**metric-type**] [**route-map** *map-name*]

Parameter Description

Parameter	Description
Always	(Optional) Generates the default route unconditionally, no matter whether the default route exists locally or not.
metric <i>metric</i>	(Optional) Initial metric of the default route in the range from 0 to 16777214
metric-type <i>type</i>	(Optional) Type of the default route. There are two type of OSPF external routes: type 1, different metrics on different devices; type 2, same metric on different devices. An external route of type 1 is more trustworthy than that of type 2.
route-map <i>map-name</i>	Associated route map name. No route map is associated by default.

Defaults

No default route is generated by default.
 The default value of metric is 1.
 The default value of metric-type is 2.

Command

Mode

Routing process configuration mode

Usage Guide

When the **redistribute** or **default-information** command is executed, the OSPF-enabled device automatically turns into the ASBR. The ASBR cannot generate the default route automatically or advertise it to all the devices in the OSPF routing domain. The ASBR can generate the default route with the **default-information originate** command in routing process configuration mode. If the **always** parameter is used, the OSPF routing process advertises an external default route to


neighbors, no matter the default route exists or not. However, the local device does not display the default route. To make sure whether the default route is generated, use the **show ip ospf database** command to display the OSPF link state database. The external link identified with 0.0.0.0 indicates the default route. You can use the show ip route command on the OSPF neighbor to display the default route.

The metric of the external default route can be defined only with the **default-information originate** command.

There are two types of OSPF external routes: type 1 external routes have changeable routing metrics, while type 2 external routes have constant routing metrics. For two parallel routes with the same route metric to the same destination network, the type 1 route takes precedence over the type 2 route. As a result, the **show ip route** command displays only the type 1 route.

This command generates a default route of Type-5 LSA, which will not be flooded to the NSSA area. To generate a default route in the NSSA area, use the **area nssa default-information-originate** command.

The routers in the stub area cannot generate external default routes.

 The range of set metric is 0 to 16777214 for the associated route map. If the value exceeds the range, introducing a route fails.

Configuration Examples

The following example configures that OSPF generates an external default route and injects it to the OSPF routing domain. The default route is of type 1 and the metric 50.

```
Orion_B54Q(config)#routerospf 1
Orion_B54Q(config-router)#network172.16.24.0 0.0.0.255 area 0
Orion_B54Q(config-router)#default-information originate
alwaysmetric50metric-type1
```

Related Commands

Command	Description
show ip ospf database	Displays OSPF link state database.
show ip route	Displays the IP route table.
Redistribute	Redistributes routes of other routing processes.

Platform N/A

Description

2.15 default-metric

Use this command to set the **default metric** of OSPF redistribution route. Use the **no** form of this command to restore the default setting.

default-metric *metric*

no default-metric

Parameter

Parameter	Description
-----------	-------------

Description	
<i>Metric</i>	Default metric of the OSPF redistribution route in the range from 1 to 16777214

Defaults The default metric is not configured by default.

Command

Mode Routing process configuration mode

Usage Guide The **default-metric** command must work with the **redistribute** command in routing process configuration mode to modify the initial metric of all redistributed routes. The configuration result of the **default-metric** command does not take effect for the external routes injected into the OSPF routing domain with the **default-information originate** command.

Configuration Examples The following example configures the default metric of the OSPF redistribution route as 50.

```
Switch(config)# router rip
Orion_B54Q(config-router)# network 192.168.12.0
Switch(config-router)# version 2
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# network 172.16.10.0 0.0.0.255 area 0
Switch(config-router)# default-metric 50
Orion_B54Q(config-router)# redistribute rip subnets
```

Related Commands	Command	Description
	Redistribute	Redistributes the routes of other routing processes.
	show ip ospf	Displays the OSPF global configuration information.

Platform N/A

Description

2.16 discard-route

Use this command to enable adding the discard-route into the core route table. Use the **no** form of this command to disable this function.

discard-route { internal | external }
no discard-route { internal | external }

Parameter Description	Parameter	Description
	Internal	Enables adding the discard-route generated with the area range command

External	Enables adding the discard-route generated with the summary-address command.
-----------------	--

Defaults Adding the discard-route is enabled by default.

Command

Mode Routing process configuration mode

Usage Guide After route aggregation, the range may exceed the actual network range of the route table, and sending the data to the nonexistent network may cause loops or increase router loads. To prevent this situation, the discard-route is added to the route table on the ABR or the ASBR. The discard-route is generated automatically and will not be transmitted.

Configuration Examples The following example disables adding the discard routes generated with the area range command.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# no discard-route internal
```

Related Commands

Command	Description
area range	Configures the route aggregation between OSPF areas.
summary-address	Configures the route aggregation out of the OSPF routing domain.

Platform N/A

Description

2.17 distance ospf

Use this command to set the Administration Distance (AD) of different types of OSPF routes. Use the **no** form of this command to restore the default setting.

```
distance { distance | ospf { [ intra-area distance ] [ inter-area distance ] [ external distance ] } }
no distance [ ospf ]
```

Parameter Description

Parameter	Description
<i>Distance</i>	Sets the route AD in the range from 1 to 255.
intra-area <i>distance</i>	Sets the AD of the intra-area route in the range from 1 to 255.
inter-area <i>distance</i>	Sets the AD of the inter-area route in the range from 1 to 255.
External <i>distance</i>	Sets the AD of the external route in the range from 1 to 255.

Defaults The default value is 110.

The default intra-area distance is 110.

The default inter-area distance is 110.

The default external distance is 110.

Command

Mode Routing process configuration mode

Usage Guide This command is used to specify different ADs for different types of OSPF routes.

Configuration Examples The following example sets the OSPF external route AD to 160.

```
Orion_B54Q(config)# routerospfl
Orion_B54Q(config-router)# distance ospf external 160
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

2.18 distribute-list in

Use this command to configure LSA filtering. Use the **no** form of this command to restore the default setting.

distribute-list { [*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*] | **route-map** *route-map-name* } **in** [*interface-type* *interface-number*]

no distribute-list { [*access-list-number* | *name*] | **prefix** *prefix-list-name* [**gateway** *prefix-list-name*] | **route-map** *route-map-name* } **in** [*interface-type* *interface-number*]

Parameter Description

Parameter	Description
<i>access-list-number</i> name	Uses the ACL filtering rule.
gateway <i>prefix-list-name</i>	Uses the gateway filtering rule.
prefix <i>prefix-list-name</i>	Uses the prefix-list filtering rule.
route-map <i>route-map-name</i>	Uses the route-map filtering rule.
<i>interface-type</i> <i>interface-number</i>	Configures the LSA route filtering on the interface.

Defaults No filtering is configured by default.

Command

Mode Routing process configuration mode

Usage Guide This configuration filters the received LSAs, and only those matching the filtering conditions are involved in the Shortest Path First (SPF) calculation to generate the corresponding routes. It does not affect the link status database or the route table of the neighbors. It only affects the routing entries calculated by local OSPF. This function is used to control routes that enter the ABR or ASBR. The following route-map rules will be supported if the route-map parameter is configured:

- match interface**
- match ip address**

- match ip address prefix-list**
- match ip next-hop**
- match ip next-hop prefix-list**
- match metric**
- match route-type**
- match tag**

Configuration Examples The following example configures LSA filtering.

```
Orion_B54Q(config)# access-list 3 permit 172.16.0.0 0.127.255
Orion_B54Q(config)# router ospf 25
Orion_B54Q(config-router)# redistribute rip metric 100
Orion_B54Q(config-router)# distribute-list 3 in ethernet 0/1
```

Related Commands

Command	Description
distribute-list out	Filters redistribution routes.

Platform N/A
Description

2.19 distribute-list out

Use this command to configure filtering redistribution routes. The function is similar to that of the **redistribute** command. Use the **no** form of this command to restore the default setting.

distribute-list { [*access-list-number* | *name*] | **prefix** *prefix-list-name* } **out** [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]
no distribute-list { [*access-list-number* | *name*] | **prefix** *prefix-list-name* } **out** [**bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static**]

Parameter Description

Parameter	Description
<i>access-list-number</i> <i>name</i>	Uses the ACL filtering rule.
prefix <i>prefix-list-name</i>	Uses the prefix-list filtering rule.
bgp connected isis [<i>area-tag</i>] ospf <i>process-id</i> rip static	Source of the routes to be filtered

Defaults No filtering is configured by default.

Command

Mode Routing process configuration mode

Usage Guide Similar to the redistribute route-map command, the distribute-list out command filters the routes that other protocols redistribute to the OSPF. However, the distribute-list out command does not redistribute routes by itself. It works with the redistribute command in most cases. The ACL filtering

rule and the prefix-list filtering rule cannot coexist in the configuration, that is, the two rules cannot be configured at the same time for routes from the same source.

Configuration Examples

The following example filters the redistributed static routes.

```
Orion_B54Q(config)# routerospfl
Orion_B54Q(config)# redistribute static subnets
Orion_B54Q(config-router)# distribute-list 22 outstatic
Orion_B54Q(config-router)# distribute-list prefix jjj out static
% Access-list filter exists, please de-config first
```

Related Commands

Command	Description
distribute-list in	Configures LSA filtering.
Redistribute	Redistributes routes of other routing processes.

Platform N/A
Description

2.20 enable mib-binding

Use this command to bind the Management Information Base (MIB) with the specified OSPFv2 process. Use the **no** form of this command to restore the default setting.

- enable mib-binding**
- no enable mib-binding**

Parameter Description

Parameter	Description
N/A	N/A

Defaults The MIB is bound with the OSPFv2 process with the smallest ID by default.

Command

Mode Routing process configuration mode

Usage Guide

OSPFv2 MIB has no OSPFv2 process information, so the user operates a sole OSPFv2 process by SNMP. By default, OSPFv2 MIB is bound with the OSPFv2 process with the smallest ID. User operations take effect for this process.

To operate the specified OSPF process over Simple Network Management Protocol(SNMP), use this command to bind the MIB to SNMP.

Configuration Examples

The following example operates OSPFv2 process 100 over SNMP:

```
Orion_B54Q(config)# routerospf100
Orion_B54Q(config-router)# enable mib-binding
```

Related

Command	Description
---------	-------------

Commands	
show ip ospf	Displays the OSPF global configuration information.
enable traps	Configures the OSPF TRAP function.

Platform N/A

Description

2.21 enable traps

The OSPFv2 process supports 16 kinds of TRAP packets, which are classified into four categories. Use this command to enable sending the specified TRAP messages. Use the **no** form of this command to restore the default setting.

enable traps [**error** [**IfAuthFailure** | **IfConfigError** | **IfRxBadPacket** | **VirtIfAuthFailure** | **VirtIfConfigError** | **VirtIfRxBadPacket**] | **Isa** [**LsdbApproachOverflow** | **LsdbOverflow** | **MaxAgeLsa** | **OriginateLsa**] | **retransmit** [**IfTxRetransmit** | **VirtIfTxRetransmit**] | **state-change** [**IfStateChange** | **NbrRestartHelperStatusChange** | **NbrStateChange** | **NssaTranslatorStatusChange** | **RestartStatusChange** | **VirtIfStateChange** | **VirtNbrRestartHelperStatusChange** | **VirtNbrStateChange**]]

no enable traps [**error** [**IfAuthFailure** | **IfConfigError** | **IfRxBadPacket** | **VirtIfAuthFailure** | **VirtIfConfigError** | **VirtIfRxBadPacket**] | **Isa** [**LsdbApproachOverflow** | **LsdbOverflow** | **MaxAgeLsa** | **OriginateLsa**] | **retransmit** [**IfTxRetransmit** | **VirtIfTxRetransmit**] | **state-change** [**IfStateChange** | **NbrRestartHelperStatusChange** | **NbrStateChange** | **NssaTranslatorStatusChange** | **RestartStatusChange** | **VirtIfStateChange** | **VirtNbrRestartHelperStatusChange** | **VirtNbrStateChange**]]

Parameter Description

Parameter	Description	
Error	Configures all traps switches related to errors. Use this parameter to set the following specified error traps switches.	
	Ifauthfailure	Interface authentication error
	Ifconfigerror	Interface parameter configuration error
	Ifrxbadpacket	Error packets received on the interface
	Virtifauthfailure	Authentication error on the virtual interface
	Virtifconfigerror	Parameter configuration error on the virtual interface
Isa	Configures all traps switches related to the LSA. Use this parameter to set the following specified LSA traps switches.	
	Lsdbapproachoverflow	External LSA count has reached the 90% of the upper limit.

Lsdboverflow	External LSA count has reached the upper limit.
Maxagelsa	LSA reaching the aging time
Originatelsa	Generates new LSA

Configures all traps switches related to the retransmission. Use this parameter to set the following specified retransmit traps switches.

Retransmit

lftxretransmit	Packet retransmission on the interface
virtiftxretransmit	Packet retransmission on the virtual interface

Configures all traps switches related to the state change. Use this parameter to set the following specified state-change switches.

state-change

lfstatechange	Interface state change
NbrRestartHelper	State change during the neighbor GR process
StatusChange	Neighbor state change
Nbrstatechange	State change of the NSSA translator
NssaTranslatorStatusChange	State change of the GR Restarter on the device
RestartStatusChange	State change on the virtual interface
Virtifstatechange	Status change of the virtual neighbor GR process
VirtNbrRestartHelper	State change on the virtual neighbor
Virtnbrstatechange	

Defaults All TRAP switches are disabled by default.

Command

Mode Routing process configuration mode

Usage Guide The **snmp-server enable traps ospf** command must be configured before you configure this command, for it is limited by the **snmp-server** command. This command is not limited by the binding of process and MIB, allowing to enable the TRAP switch for different processes simultaneously.

Configuration Examples The following example enables all TRAP switches of OSPFv2 process 100.

```
Orion_B54Q(config)# routerospf100
Orion_B54Q(config-router)# enable traps
```

Related Commands

Command	Description
---------	-------------

show ip ospf	Displays the OSPF global configuration information.
enable mib-binding	Binds the OSPFv2 process with MIB.
snmp-server enable traps ospf	Enables the OSPF TRAP notification function.

Platform N/A
Description

2.22 fast-reroute

Use this command to enable the OSPF FRR (Fast Reroute) function for the device. Use the **no** form of this command to restore the default setting.

fast-reroute { lfa [downstream-paths] | route-map *route-map-name* }
no fast-reroute { lfa [downstream-paths] | route-map }

Parameter Description	Parameter	Description
	Lfa	Enables the LFA (loop-free alternate) path computation.
	downstream-paths	Enables the downstream path computation.
	route-map <i>route-map-name</i>	Specifies the backup path through the route map.

Defaults The FRR function is disabled by default.

Command

Mode Routing process configuration mode

Usage Guide

Configuring the **lfa** parameter will enable loop-free backup path computation. In this case, the path protection mode for an interface can be specified via the interface mode command.

Configuring the **downstream-paths** parameter will enable downstream path computation.

Configuring the **route-map** parameter can specify backup paths for successfully matched routes via a route map.

It is recommended to use the BFD function with OSPF FRR. In this manner, the device can detect link faults more rapidly to reduce forwarding interruption time. For interface up/down scenarios, to reduce forwarding interruption time of OSPF FRR, you can configure **carrier-delay 0** for fastest switchover.

Note: OSPF FRR has the following restrictions:

- Each route can only generate one backup next hop.
- The backup next hop cannot be generated for ECMP.

Configuration Examples

The following example enables FRR for OSPF instance 1 and associates route map *fast reroute*.

```

Orion_B54Q(config)# route-map fast-reroute
Orion_B54Q(config-route-map)# match ip address 1
Orion_B54Q(config-route-map)# set fast-reroute backup-nexthop
GigabitEthernet 0/1 192.168.1.2
Orion_B54Q(config)# router ospf 1
    
```



```
Orion_B54Q(config-router)# fast-reroute route-map fast-reroute
```

Related Commands

Command	Description
graceful-restart helper	Enables the OSPF graceful-restart helper.

Platform Description

N/A

2.23 graceful-restart

Use this command to enable the graceful restart (GR) of OSPF on the device. Use the **graceful-restart grace-period** command to configure the grace period parameter and enable the OSPF GR function. Use the **no** form of this command to disable this function.

graceful-restart [**graceful-period** *grace-period*]
no graceful-restart [*graceful-period*]

Parameter Description

Parameter	Description
grace-period	(optional)Explicitly configures grace-period.
<i>grace-period</i>	User-set GR interval in the range from1 to 1800 seconds. It is the longest time between the OSPF invalidation and the OSPF graceful restart. The default value is 120 seconds.

Defaults This function is enabled by default.

Command

Mode Routing process configuration mode

Usage Guide

GR is configured based on the OSPF instance. Different instances could be configured with different parameters according to the actual situation.

The graceful restart interval is the longest time between the OSPF restart and the graceful restart. In this period, you can perform link status reconstruction to restore the OSPF status to the original. With the interval times out, the OSPF will exit GR and perform common OSPF operations.

The GR interval is 120 seconds set with the graceful-restart command, and the graceful-restart grace-period command allows you to change the interval explicitly.

GR is unavailable when the Fast Hello function is enabled.

Configuration Examples

The following example enables GR for the OSPF instance 1 and sets the restart interval for GR.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# graceful-restart
Orion_B54Q(config-router)# graceful-restart grace-period 60
```

Related Commands

Command	Description
graceful-restart helper	Enables the OSPF graceful-restart helper.

Platform N/A
Description

2.24 graceful-restart helper

Use this command to enable the graceful restart helper function. Use the **no** form of this command to restore the default setting.

graceful-restart helper disable

no graceful-restart helper disable

graceful-restart helper { strict-lsa-checking | internal-lsa-checking}

no graceful-restart helper {strict-lsa-checking | internal-lsa-checking}

Parameter Description	Parameter	Description
	Disable	Disables the device to assist other devices in performing GR.
	strict-lsa-checking	Checks the change of the LSA of types 1-5 and 7 to determine whether the network changes. If yes, the GR helper will be disabled.
	internal-lsa-checking	Checks the change of the LSA of types 1–3 to judge the network whether changes. If so, the GR helper will be disabled.

Defaults The GR helper is enabled by default.
 The router enabled with the GR helper does not check the LSA change by default.

Command

Mode Routing process configuration mode

Usage Guide Use this command to enable the GR helper. When one neighbor device performs graceful restart, the Grace-LSA is advertised to all neighbors. If the device enabled with the GR helper receives the Grace-LSA, it will become the GR Helper to help the neighbors perform GR. The **disable** option means that it is not allowed to perform the GR helper function for any device in GR.

The GR helper does not check the network change by default. The convergence is not performed again until the GR is implemented even if the network changes. Use the **strict-lsa-checking** **or internal-lsa-checking** command to enable quick check for the changed network during the GR. The former checks any LSA (types 1-5,7) that stands for the network information, the latter checks the LSA that stands for the AS inner-area route. In the large scale network, it is not recommended to enable the LSA check option because the local network changes trigger the ending of the GR, decreasing the convergence speed of the entire network.

Configuration Examples The following example disables the GF helper and modifies the policy of checking network changes.

```
Orion_B54Q(config)# router ospf1
Orion_B54Q(config-router)# graceful-restart helper disable
Orion_B54Q(config-router)# no graceful-restart helper disable
Orion_B54Q(config-router)# graceful-restart helper
strict-lsa-checking
```

Related Commands

Command	Description
graceful-restart	Enables GR on the device.

Platform N/A
Description

2.25 ip ospf authentication

Use this command to configure the authentication type. Use the **no** form of this command to restore the default setting.

ip ospf authentication [message-digest | null]

no ip ospf authentication

Parameter Description

Parameter	Description
message-digest	Enables MD5 authentication on the interface.
Null	Enables no authentication.

Defaults No authentication mode is configured and that of the local area is used on the interface by default.

Command

Mode Interface configuration mode

Usage Guide

Plaintext authentication is applicable when **no** option is used with the command. Note that the no form of this command restores the default value. Whether authentication is used actually depends on authentication mode configured for the local area of the interface. If authentication mode is configured as **null**, no authentication is enabled. When both the interface and its area are configured with authentication, the one for the interface takes precedence.

Configuration Examples

The following example configures MD5 authentication for OSPF on fastEthernet 0/1.

```
Orion_B54Q (config)#interface fastEthernet0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ipaddress172.16.1.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf authentication
message-digest
```

Related Commands

Command	Description
area authentication	Enables authentication and defines authentication mode in the OSPF area.
ip ospf authentication-key	Configures the plain text authentication key.
ip ospf message-digest-key	Configures the MD5 authentication key.

Platform N/A

Description

2.26 ip ospf authentication-key

Use this command to configure the OSPF plain text authentication key in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf authentication-key [0 | 7] key

no ip ospf authentication-key

Parameter Description

Parameter	Description
0	Displays the key in plain text.
7	Displays the key in cipher text.
Key	Key containing at most eight characters.

Defaults N/A

Command

Mode Interface configuration mode

Usage Guide

The **ip ospf authentication-key** command configures the key that will be inserted in all OSPF packet headers. As a result, if the keys are inconsistent, the OSPF neighbor relationship cannot be established between two devices directly connected, and thus route information exchange is impossible.

The keys may vary by interface, but the devices that are connected to the same physical network segment must use the same key.

To enable the OSPF area authentication, execute the area authentication command in routing process configuration mode.

The authentication can be enabled separately on an interface by executing the ip ospf authentication command in interface configuration mode. When both the interface and the area are configured with authentication, the one for the interface takes precedence.

Configuration Examples

The following example configures the OSPF authentication key ospfauth for fast Ethernet 0/1.

```
Orion_B54Q (config)#interfacefastEthernet0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ipaddress172.16.1.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf authentication-key
ospfauth
```

Related Commands

Command	Description
area authentication	Enables OSPF area authentication and defines authentication mode
ip ospf authentication	Enables authentication on the interface and defines authentication mode

Platform N/A
Description

2.27 ip ospf bfd

Use this command to enable or disable the BFD on the specified OSPF interface. Use the **no** form of this command to restore the default setting.

ip ospf bfd [disable]

no ip ospf bfd [disable]

Parameter Description	Parameter	Description
	Disable	Disables BFD on the specified OSPF interface.

Defaults BFD is not configured by default, and the BFD configuration in OSPF process configuration mode shall prevail.

Command

Mode Interface configuration mode

Usage Guide The **ip ospf bfd** in interface configuration mode command takes precedence over the **bfd all-interfaces** command in routing process configuration mode.

You can use this command to enable the BFD on the specified interface according to the actual environment. You can also use the **bfd all-interfaces** command in OSPF process configuration mode to enable BFD on all OSPF interfaces and the **ip ospf bfd disable** command to disable BFD on the specified interface.

Configuration Examples N/A

Related Commands	Command	Description
	router ospf	Creates the OSPF routing process and enters routing process configuration mode.
	bfd all-interfaces	Enables the BFD on all OSPF interfaces.

Platform N/A
Description

2.28 ip ospf cost

Use this command to configure the cost (OSPF metric) of the OSPF interface for sending a packet in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf cost cost

no ip ospf cost

Parameter Description	Parameter	Description
	<i>Cost</i>	OSPF interface cost in the range from 0 to 65535

Defaults The default interface cost is calculated as follows:
Reference bandwidth/Bandwidth
The reference bandwidth is 100 Mbps by default.

Command

Mode Interface configuration mode

Usage Guide By default, the OSPF interface cost is 100Mbps/Bandwidth, where Bandwidth is the interface bandwidth configured with the bandwidth command in interface configuration mode.

The default costs of different types of lines are as follows:

- 64K serial line: 1562
- E1 line: 48
- 10M Ethernet: 10
- 100M Ethernet: 1

The OSPF cost configured with the **ip ospf cost** command will overwrite the default configuration.

Configuration Examples The following example configures the OSPF cost of fastEthernet 0/1 to 100.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf cost 100
```

Related Commands

Command	Description
Bandwidth	Specifies the interface bandwidth. This setting does not affect the data transmission rate.
show ip ospf	Displays the OSPF global configuration information

Platform N/A

Description

2.29 ip ospf database-filter all out

Use this command to stop advertising LSAs of an interface, that is, the LSA update packets are not sent on the interface. Use the **no** form of the command to restore the default setting.

ip ospf database-filter all out

no ip ospf database-filter

Parameter	Parameter	Description
-----------	-----------	-------------

Description		
	N/A	N/A

Defaults This function is disabled and all LSA update packets can be sent on the interface by default.

Command

Mode Interface configuration mode

Usage Guide To stop sending LSA update packets on the interface, enable this function on the interface. Then, the device maintains the neighboring connections and accepts LSAs from neighbors, but stops sending LSAs to neighbors.

Configuration Examples The following example stops sending LSA update packets of fastEthernet 0/1.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf database-filter all out
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

2.30 ip ospf dead-interval

Use this command to configure the interval for determining the death of an interface neighbor in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf dead-interval *seconds*

no ip ospf dead-interval

Parameter Description	Parameter	Description
	<i>Seconds</i>	Defines the interval for determining the neighbor death in seconds. The range is from 0 to 2,147,483,647.

Defaults The value of dead-interval is 4 times the interval configured with the **ip ospf hello-interval** command by default.

Command

Mode Interface configuration mode

Usage Guide You can use the **show ip ospf interface** command to display dead-interval configured for an interface.

Configuration The following example configures the interval for determining the death of the OSPF neighbor on

n Examples fastEthernet 0/1 to30seconds.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf dead-interval30
```

Related Commands	Command	Description
	ip ospf hello-interval	Specifies the interval at which the OSPF sends Hello packets
	show ip ospf interface	Displays OSPF interface information.

Platform N/A
Description

2.31 ip ospf disable all

Use this command to prevent the specified interface from generating OSPF packets. Use the **no** form of this command to restore the default setting.

ip ospf disable all
no ip ospf disable all

Parameter Description	Parameter	Description
	N/A	N/A

Defaults OSPF packets are generated on the specified interface by default.

Command Mode

Interface configuration mode

Usage Guide The interface configured with this command will ignore whether the network areas are matched. After this command is configured, an interface will not generate OSPF packets even if the interface belongs to the network; therefore, the interface does not receive or send any OSPF packets or participate in OSPF calculation.

Configuration Examples The following example prevents the specified interface from generating OSPF packets.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf disable all
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

2.32 ip ospf fast-reroute protection

Use this command to specify the loop-free alternate (LFA) protection mode for an interface. Use the **no** form of this command to restore the default setting.

ip ospf fast-reroute protection { node | link-node | disable }
no ip ospf fast-reroute protection

Parameter Description	Parameter	Description
	Node	Enables LFA node protection.
	link-node	Enables LFA link node protection.
	Disable	Disables LFA protection.

Defaults LFA node protection is enabled by default.

Command

Mode Interface configuration mode

Usage Guide Enabling the **fast-reroute lfa** command in OSPF process configuration mode will enable OSPF fast reroute and generate a backup route for the master route according to the specified LFA protection mode in interface configuration mode. By default, link protection is enabled on each OSPF interface. In this protection mode, the failure of a master link does not affect forwarding on the backup route. Use the **node** parameter to enable node protection for an interface, that is, the neighbor node of a master link does not affect forwarding on the backup route. Similarly, use the **link-node** parameter to protect the link and neighbor link of a master route at the same time. Use the **disable** parameter to disable the LFA protection function for an interface, that is, a backup entry is not generated for the routes with this interface as the next hop.

Configuration Examples The following example sets OSPF LFA fast reroute to link and node protection:

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf fast-reroute protection
link-node
```

Related Commands	Command	Description
	fast-reroute	Enables OSPF fast reroute.

Platform N/A
Description

2.33 ip ospf fast-reroute no-eligible-backup

Use this command in interface configuration mode to exclude an OSPF interface as a backup interface in OSPF fast reroute calculation. Use the **no** form of this command to restore the default setting.

ip ospf fast-reroute no-eligible-backup
no ip ospf fast-reroute no-eligible-backup

Parameter Description	Parameter	Description
	N/A	N/A

Defaults An OSPF interface can serve as a backup interface by default.

Command

Mode Interface configuration mode

Usage Guide If an interface has small superfluous bandwidth or may fail with the master interface at the same time, this interface is not suitable to act as a backup interface. In this case, this command is used.

Configuration Examples The following example excludes FastEthernet 0/1 as a backup interface in OSPF fast reroute calculation.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf fast-reroute no-eligible-backup
```

Related Commands	Command	Description
	fast-reroute	Enables OSPF fast reroute.

Platform Description N/A

2.34 ip ospf hello-interval

Use this command to set the interval for sending Hello packets in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf hello-interval seconds
no ip ospf hello-interval

Parameter Description	Parameter	Description
	<i>Seconds</i>	Interval for sending Hello packets in seconds. The range is from 1 to

	65535.
--	--------

Defaults The defaults are as follows:
 10seconds for Ethernet
 10secondsfor PPP or HDLC encapsulated interfaces
 10seconds for frame relay PTP interfaces
 30seconds for non-frame relay PTP sub-interface and X.25 interfaces

Command

Mode Interface configuration mode

Usage Guide The interval of sending the Hello packets is included in the Hello packet. A shorter interval means that OSPF detects the topological change faster, which will increase network traffic. The Hello packet sending intervals for all the devices in the same network segment must be the same. To manually modify the interval to determine neighbor death, ensure that the Hello packet sending interval cannot be greater than dead-interval of the neighbor.

Configuratio n Examples The following example configures the interval of sending the Hello packets on fastEthernet 0/1 to15.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address172.16.10.1
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf hello-interval15
```

Related Commands

Command	Description
ip ospf dead-interval	Sets the interval for determining the death of the OSPF neighbor.

Platform N/A

Description

2.35 ip ospf message-digest-key

Use this command to configure the MD5 authentication key in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf message-digest-key *key-id* **md5** [**0** | **7**] *key*
no ip ospf message-digest-key *key-id*

Parameter Description

Parameter	Description
<i>Key</i>	Key of up to 16 characters
0	Displays the key in plain text.
7	Displays the key in cipher text.
<i>key-id</i>	Key identifier in the range from1 to 255

Defaults No MD5 key is configured by default.

Command

Mode Interface configuration mode

Usage Guide The **ip ospf message-digest-key** command configures the key that will be inserted in all OSPF packet headers. As a result, if the keys are inconsistent, the OSPF neighboring relationship cannot be established between two devices directly connected, and thus route information exchange is impossible.

The keys can be different for different interfaces, but the devices that are connected to the same physical network segment must be configured with the same key. For neighbors, the same key identifier must correspond to the same key.

To enable OSPF area authentication, execute the **area authentication** command in routing process configuration mode. The authentication can be enabled separately on an interface by executing the **ip ospf authentication** command in interface configuration mode. When both the interface and the area are configured with authentication, the one for the interface takes precedence.

The NOS software supports smooth modification of MD5 authentication keys, which shall be added before deleted. When an MD5 authentication key of the device is added, the device will regard other devices have not had new keys and thus send multiple OSPF packets by using different keys, till it confirms that the neighbors have been configured with new keys. When all devices have been configured with new keys, it is possible to delete the old key.

Configuration Examples The following example adds a new OSPF authentication key "hello5" with key ID 5 for fastEthernet 0/1.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip address 172.16.24.2
255.255.255.0
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf authentication message-
digest
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf message-digest-key 10 md5
hello10
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf message-digest-key 5md5
hello5
```

When all neighbors are added with new keys, the old keys shall be deleted for all devices.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# no ip ospf message-digest-key10md5
hello10
```

Related Commands

Command	Description
area authentication	Enables OSPF area authentication and defines authentication mode.
ip ospf authentication	Enables authentication on the interface and defines authentication mode.

Platform N/A
Description

2.36 ip ospf mtu-ignore

Use this command to disable the MTU check when an interface receives the database description packet. Use the **no** form of this command to restore the default setting.

ip ospf mtu-ignore
no ip ospf mtu-ignore

Parameter Description	Parameter	Description
	N/A	N/A

Defaults MTU check is disabled by default.

Command

Mode Interface configuration mode

Usage Guide After receiving the database description packet, the device will check whether the MTU of the neighbor interface is the same as its own MTU. If the received database description packet indicates an MTU greater than the interface’s MTU, the neighboring relationship cannot be established. This can be fixed by disabling the MTU check.

Configuration Examples The following example disables the MTU check function on fastEthernet 0/1.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf mtu-ignore
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

2.37 ip ospf network

Use this command to configure the OSPF network type in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf network { broadcast | non-broadcast | point-to-multipoint [non-broadcast] | point-to-point}
no ip ospf network

Parameter Description	Parameter	Description
-----------------------	-----------	-------------

Broadcast	Sets the OSPF network type as the broadcast type.
non-broadcast	Sets the OSPF network type as the non-broadcast multi-path access type, i.e. NBMA network.
point-to-multipoint [non-broadcast]	Sets the OSPF network type as the point-to-multipoint type. The value is the point-to-multipoint broadcast type by default. The non-broadcast option means the point-to-multipoint non-broadcast type.
point-to-point	Sets the OSPF network type as the point-to-point type.

Defaults

The default configurations are as follows:

PTP network type: Point-to-Point Protocol(PPP), Serial Line Internet Protocol(SLIP), frame relay point-to-point (PTP) sub-interface, X.25 PTP sub-interface encapsulation

NBMA network type: frame relay (except for PTP sub-interface), X.25 encapsulation (except for PTP sub-interface)

Broadcast network type: Ethernet encapsulation

By default, the network type is the point-to-multipoint network type.

Command**Mode**

Interface configuration mode

Usage Guide

Networks are divided into three types according to the transmission feature of media:

- Broadcast network (Ethernet, token ring and Fiber Distributed-Data Interface (FDDI))
- Non-broadcast network (frame relay and X.25)
- PTP network (High-Level Data Link Control (HDLC), PPP and SLIP)
- The non-broadcast network is further divided into two sub-types by the OSPF operation mode:
- Non-broadcast multi-path access (NBMA) type. NBMA requires all interconnected devices can directly communicate to each other, and only full mesh type connection can meet this requirement. There is no problem in using the Switching Virtual Circuit (SVC)(such as X.25) connections, but it is difficult in case of networking with Permanent Virtual Circuit (PVC) (such as frame relay). The OSPF on the NBMA network operates similarly to that on the broadcast network, where the Designated Device shall be elected to advertise the link state of the NBMA network.
- Point-to-multipoint network type. If the network topology is not a full mesh type non-broadcast network, the OSPF requires the network type to be configured as the point-to-multipoint network type. In the point-to-multipoint network type, OSPF regards all inter-device connections as PTP links and does not participate in the election of the designated device. The point-to-multipoint network type is further divided into the broadcast type and the non-broadcast type. For the non-broadcast type, it is required to manually configure the static neighbor.
- Whatever the default network type of the interface, you must set it to the broadcast network type. For example, the non-broadcast multi-path access network (frame relay and X.25) can be configured as broadcast network, so that the configuration of neighbors can be omitted during the OSPF routing process configuration. The X.25 map and frame-relay map commands may

enable the X.25 and frame relay networks with broadcasting capability, so that the OSPF can regard such networks as X.25 and frame relay as broadcast network.

- The interface of the point-to-multipoint network can be configured with one or more neighbors. When the OSPF is configured as the point-to-multipoint network type, multiple host routes may be generated. In contrast to the broadcast network type, the point-to-multipoint network type features the following benefits:
 - Easy configuration without need to configure neighbors or election of the designated device
 - Small cost, without needing the fully meshed topology

For the dial-up network, frame relay and X.25 network, to manually configure the IP address mapping table, the keyword "broadcast" must be specified to support broadcast.

Configuration Examples

The following example configures the frame relay interface network as the broadcast type, which is applicable to the full mesh type frame relay connections.

```
Orion_B54Q(config)# interface Serial 1/0
Orion_B54Q(config-if-Serial 1/0)# ip address 172.16.24.4
255.255.255.0
Orion_B54Q(config-if-Serial 1/0)# encapsulation frame-relay
Orion_B54Q(config-if-Serial 1/0)# ip ospf network broadcast
```

The following example configures the frame relay interface network as the point-to-multipoint type, which is applicable to the non-full-mesh type frame relay connections.

```
Orion_B54Q(config)# interface Serial 1/0
Orion_B54Q(config-if-Serial 1/0)# ip address 172.16.24.4
255.255.255.0
Orion_B54Q(config-if-Serial 1/0)# encapsulation frame-relay
Orion_B54Q(config-if-Serial 1/0)# ip ospf network point-to-multipoint
```

The following example configures the frame relay interface network as the broadcast type, with the designated device/backup designated device (DR/BDR) specified, which is applicable to the full or partial mesh type frame relay connections. The following configuration needs to be done on all branch node devices and non-designated devices (limited to become the DR/BDR).

```
Orion_B54Q(config)# interface Serial 1/0
Orion_B54Q(config-if-Serial 1/0)# ip address 172.16.24.4
255.255.255.0
Orion_B54Q(config-if-Serial 1/0)# encapsulation frame-relay
Orion_B54Q(config-if-Serial 1/0)# ip ospf network broadcast
Orion_B54Q(config-if-Serial 1/0)# ip ospf priority 0
```

Related Commands

Command	Description
dialer map ip	Defines the mapping between IP address and dialing number.
frame-relay map	Defines the mapping between IP address and frame DLCI.

neighbor(OSPF)	Defines the IP address of neighbor applicable to NBMA network type and point-to-multipoint non-broadcast type only.
X25 map	Defines the mapping between IP address and X.25 network address.

Platform N/A

Description

2.38 ip ospf priority

Use this command to configure the OSPF priority in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf priority *priority*

no ip ospf priority

Parameter	Parameter	Description
Description	<i>priority</i>	Sets the OSPF priority of the interface in the range from 0 to 255.

Defaults The default is 1.

Command

Mode Interface configuration mode

Usage Guide The interface priority is included in the Hello packet. When DR/BDR election occurs in the OSPF broadcast type network, the device with higher priority will become the DR or BDR. If the devices have the same priority, the one with higher ID will become the DR or BDR. The device with priority 0 cannot become DR or BDR. This command is valid only for OSPF broadcast and non-broadcast network types.

Configuration Examples The following example configures the priority of fastethernet 0/1 as 0.

```
Switch(config)#interface fastethernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ipospfpriority0
```

Related Commands	Command	Description
	ip ospf network	Configures the network type of the interface.

Platform N/A

Description

2.39 ip ospf retransmit-interval

Use this command to define the interval for sending the link state update (LSU) packet on the

interface in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf retransmit-interval *seconds*

ip ospf retransmit-interval

Parameter Description

Parameter	Description
<i>Seconds</i>	Interval for sending the LSU packets in seconds. The range is from 0 to 65535. This interval must be greater than the round trip delay of packets between two neighbors.

Defaults The default is 5.

Command

Mode Interface configuration mode

Usage Guide

After the device sends an LSU packet, the LSU packet stays in the transmission buffer queue. If no confirmation from the neighbor is obtained in the interval defined with the **ip ospf retransmit-interval** command, the LSU will be sent once again.

In serial lines or virtual links, the retransmission interval shall be slightly larger. The LSU packet retransmission interval of virtual links is defined with the area virtual-link command followed with the keyword retransmit-interval.

Configuration Examples

The following example configures the LSU packet retransmission interval on fastEthernet 0/1 as 10 seconds.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf retransmit-interval 10
```

Related Commands

Command	Description
area virtual-link	Defines an OSPF virtual link.

Platform Description N/A

2.40 ip ospf source-check-ignore

Use this command to disable the source address check in the point-to-point link. Use the **no** form of this command to restore the default setting

ip ospf source-check-ignore

no ip ospf source-check-ignore

Parameter Description

Parameter	Description
N/A	N/A

Defaults This function is enabled by default.

Command

Mode Interface configuration mode

Usage Guide For OSPF, the source address of the received packet is required to be in the same network segment with the receiving interface. However, in a point-to-point link, the addresses of two ends of the link are individually set, and they are not required to be in the same network segment. The peer address is informed during the process of point-to-point link negotiation; therefore, OSPF will check whether the source address of the packet is the informed one. If no, the OSPF regards this packet as illegal and drops it. In some applications, the addresses informed during the negotiation are shielded. You need to disable the source address check to ensure the normal establishment of OSPF neighbors. The source address check shall be never enabled, especially for the unnumbered interfaces.

Configuration Examples The following example disables the source address check function in the point-to-point link.

Configuration Examples

```
Orion_B54Q(config)# interface serial 1/0
Orion_B54Q(config-if)# ip ospf source-check-ignore
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

2.41 ip ospf transmit-delay

Use this command to define the LSU packet transmission delay in interface configuration mode. Use the **no** form of this command to restore the default setting.

ip ospf transmit delay seconds

no ip ospf transmit delay

Parameter Description

Parameter	Description
<i>Seconds</i>	LSU packet transmission delay in seconds in the range from 0 to 65535.

Defaults The default is 1.

Command

Mode Interface configuration mode

Usage Guide Before the LSU packet is transmitted, the Age field in all the LSAs of the packet will be increased by the value defined with the **ip ospf transmit-delay** command in interface configuration mode. The configuration of this parameter shall consider the transmission and line transmission delay of the interface. For low-rate lines, the transmission delay of the interface shall be slightly larger. The LSU

packet transmission delay of the virtual link is defined with the **area virtual-link** command followed with the keyword **retransmit-interval**.

The NOS software will resend or request resending the LSA with Age up to 3600. If no update is obtained in time, the aged LSA will be cleared from the link state database.

Configuration Examples The following example configures the transmission delay of fastEthernet 0/1 as 10.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if-FastEthernet 0/1)# ip ospf transmit-delay 10
```

Related Commands	Command	Description
		area virtual-link

Platform N/A
Description

2.42 ispf enable

Use this command to enable the ISPF function. Use the **no** form of this command to disable the ISPF function.

ispf enable
no ispf enable

Parameter Description	Parameter	Description
		N/A

Defaults ISPF is disabled by default.

Command Mode Routing process configuration mode

Usage Guide OSPF adopts the SPF algorithm to calculate the network topology within an area. SPF algorithm is run for each area independently, Incremental SPF algorithm (ISPF) is an area-based algorithm, If the topology changes, the ISPF algorithm will calculate only the affected notes of the topology rather than calculating the entire tree, which speeds up the OSPF route convergence and saves CPU resources. Because the ISPF algorithm is not shared among routers, each router within the same network can have a unique ISPF algorithm. To ensure a faster OSPF convergence, the ISPF function should be enabled on every router within the network. Enabling ISPF function only affects the choice of topology calculating algorithm for OSPF. So you can configure the delay time for the ISPF with the **timers spf** command and the **timers throttle spf** command as well.

Configuration Examples The following example enables the ISPF function.

```
Orion_B54Q(config)# router ospf 1
```

```
Orion_B54Q(config-router)# ispf enable
```

The following example enables the ISPF function on the specified VRF.

```
Orion_B54Q(config)# router ospf 1 vrf vpn1
```

```
Orion_B54Q(config-router)# ispf enable
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

2.43 log-adj-changes

Use this command to enable the logging of the neighbor state changes. Use the **no** form of the command to disable this function.

log-adj-changes [detail]

no log-adj-changes [detail]

Parameter Description

Parameter	Description
Detail	Records the detail of changes.

Defaults

This function is enabled by default. Without the detail parameter, the system records the logs that the neighbor enters or exits the full state.

Command

Mode

Routing process configuration mode

Usage Guide

N/A

Configuration Examples

The following example logs the neighbor state changes.

```
Orion_B54Q(config)# router ospf 1
```

```
Orion_B54Q(config-router)# log-adj-changes detail
```

Related Commands

Command	Description
show ip ospf	Displays the OSPF global configuration information.

Platform

N/A

Description

2.44 max-concurrent-dd

Use this command to specify the maximum number of DD packets that can be processed (initiated or accepted) at the same time. Use the **no** form of this command to restore the default setting.

max-concurrent-dd *number*

no max-concurrent-dd

Parameter Description	Parameter	Description
	<i>Number</i>	Maximum number of DD packets in the range from 1 to 65535

Defaults The default is 5.

Command

Mode Routing process configuration mode

Usage Guide When a router is exchanging data with multiple neighbors, its performance will be affected. This command is configured to limit the maximum number of DD packets that each OSPF instance can have at the same time.

Configuration Examples The following example sets the maximum number of DD packets to 4. After the configuration, the device can initiate to interact with four neighbors and can concurrently accept the interaction. That is, the device can interact with a maximum of eight neighbors.

```
Orion_B54Q(config)# routerospf10
Orion_B54Q(config-router)# max-concurrent-dd4
```

Related Commands	Command	Description
	router ospf max-concurrent-dd	Sets the maximum number of neighbors allowed in concurrent interaction for all OSPF routing processes.

Platform N/A

Description

2.45 max-metric

Use this command to set the maximum metric of the router-Isa, so that this routing device will not firstly be used as the transmission node by other devices in SPF computing. Use the **no** form of this command to restore the default setting.

max-metric router-Isa [**external-Isa** [*max-metric-value*]][**include-stub**][**on-startup** [*seconds*]][**summary-Isa** [*max-metric-value*]]

no max-metric router-Isa [**external-Isa** [*max-metric-value*]][**include-stub**][**on-startup** [*seconds*]][**summary-Isa** [*max-metric-value*]]

Parameter Description	Parameter	Description
	router-lsa	Configures the maximum metric (0xFFFF) of non-stub links in the Router LSA.
	external-lsa	Uses the maximum metric instead of the external-lsa metric (including the Type-5 and Type-7).
	<i>max-metric-value</i>	Maximum metric of the LAS. The range is 1 to 16777215. The default value is 16711680,
	include-stub	Configures the maximum metric of the stub links in the Router LSA.
	on-startup	Advertises the maximum metric when the routing device starts up.
	<i>Seconds</i>	Interval of advertising the maximum metric. The range is 5 to 86400. The default value is 600 seconds.
	summary-lsa	Uses the maximum metric to replace the summary LSA metric. (including Type-3 and Type-4)

Defaults The normal metric LSAs are used by default.

Command

Mode Routing process configuration mode

Usage Guide

With the **max-metric router-lsa** command enabled, the maximum metric of non-stub links in the Router LSA generated by the routing device is set. The link's normal metric is restored after canceling this configuration or reaching the timer.

By default, with this command enabled, the normal metric of the stub links is still advertised, which is the output interface cost. If the **include-stub** parameter is configured, the maximum metric of the stub links will be advertised.

When the device acts as an ABR, if no interval flow transmission is expected, use the **summary-lsa** parameter to set the summary LSA as the maximum metric.


When the device acts as an ASBR device, if no external flow transmission is expected, use the **external lsa** parameter to set the external LSA as the maximum metric.

The **max-metric router-lsa** command is usually used in the following scenes:

The device is restarted, which generally makes the IGP protocol converge faster, so that other devices attempt forwarding the dataflow through the new started-up device. If the current device remains establishing a BGP routing table, the packets sent to these networks will be discarded due to some BGP routings have not been learned. In this case, use the **on-startup** parameter to set certain delay, so that this device can serve as a transmission node after restarting.

The device is added into the network without being used for dataflow transmission. If the backup path exists, the current device is not used for the dataflow transmission. Otherwise, this device is still used to transmit the dataflow.

Remove the device from the network gracefully. With this command enabled, the current device advertises the maximum metric to all devices, as that the other devices in this network can choose the backup path to for the dataflow transmission before the current device is removed.

 For the OSPF implementation in the earlier versions (RFC 1247 or earlier versions), the links with the maximum metric (0xFFFF) in the LSA will not participate in the SPF calculation, that is,

no dataflow will be sent to the router that have generated these LSAs.

Configuration Examples The following example configures the LSA maximum metric as 100 seconds after starting the device.

```
Orion_B54Q(config)# router ospf 20
Orion_B54Q(config-router)# max-metric router-lsa on-startup 100
```

Related Commands	Command	Description
		show ip ospf

Platform N/A

Description

2.46 neighbor

Use this command to define the OSPF neighbor in routing process configuration mode. Use the **no** form of this command to restore the default setting.

neighbor *ip-address* [**poll-interval** *seconds*] [**priority** *priority*] [**cost** *cost*]]

no neighbor *ip-address* [[**poll-interval**] [**priority**] | [**cost**]]

Parameter Description	Parameter	Description
		<i>ip address</i>
	poll-interval <i>seconds</i>	(Optional) Specifies the interval of polling neighbors in seconds. The range is from 0 to 2147483647. Only the non-broadcast (NBMA) network type supports this option.
	priority <i>priority</i>	(Optional) Configures the priority of non-broadcast network neighbors. The range is from 0 to 255. Only the non-broadcast (NBMA) network type supports this option.
	cost <i>cost</i>	(Optional) Configures the cost to each neighbor in point-to-multipoint network, not defined by default, where the cost configured on the interface will be used. The range is from 0 to 65535. Only the point-to-multipoint [non-broadcast] network type supports this option.

Defaults No neighbor is defined by default.
 The default neighbor polling interval is 120 seconds.
 The default NBMA neighbor priority is 0.

Command

Mode Routing process configuration mode

Usage Guide The NOS software must explicitly configure the neighbor information for every non-broadcast network neighbor. The IP address of a neighbor must be the master IP address of that neighbor

interface.

In the NBMA network, if the neighbor device becomes inactive, in other words, if the Hello packet is not received within the device dead-interval, the OSPF will send more Hello packets to the neighbor. The interval at which the Hello packets are sent is called the polling interval. When the OSPF starts to work for the first time, it sends Hello packets only to the neighbor whose priority is not 0, so that the neighbor whose priority is set as 0 will not participate in the DR/BDR election. When the DR/BDR is generated, the DR/BDR sends the Hello packets to all neighbors to establish the neighbor relationship.

Since the point-to-multipoint non-broadcast network has no broadcast capability, neighbors cannot be found dynamically. So, it is required to use this command to manually configure neighbor. In addition, it is possible to configure the cost to each neighbor through the cost option for the point-to-multipoint network type.

Configuration Examples

The following example declares an OSPF non-broadcast network neighbor, with the IP address 172.16.24.2, priority 1 and polling interval 150 seconds.

```
Orion_B54Q(config)# routerospf 20
Orion_B54Q(config-router)# network 172.16.24.0 0.0.0.255 area 0
Orion_B54Q(config-router)# neighbor 172.16.24.2 priority 1 poll-interval 150
```

Related Commands

Command	Description
ip ospf priority	Sets the interface priority.
ip ospf network	Sets the network type

Platform N/A
Description

2.47 network area

Use this command to define which interfaces run OSPF and the OSPF areas they belong to in routing process configuration mode. Use the **no** form of this command to restore the default setting.

network *ip-address wildcard area area-id*
no network *ip-address wildcard area area-id*

Parameter Description

Parameter	Description
<i>ip-address</i>	IP address of the interface
<i>Wildcard</i>	Defines the comparison bits in the IP address, with 0 for exact match and 1 for no comparison
<i>area-id</i>	OSPF area identifier. An OSPF area is always associated with an address range. For easy of management, a subnet can be used as the OSPF area identifier.

Defaults No OSPF area is configured by default.

Command

Mode Routing process configuration mode

Usage Guide The ip-address and wildcard parameters allow associating multiple interfaces with one OSPF area. To run OSPF on an interface, it is required to include the primary IP address and secondary IP address of the interface in the IP address range defined by the network area command. If only the secondary IP address is included, OSPF cannot be enabled on the interface. You can determine the OSPF process that the interface takes part in by the means of the best match if the IP address of the interface matches the IP address ranges defined by the network command in multiple OSPF processes.

Configuration Examples The following example defines:
 Three areas: 0, 1 and 172.16.16.0
 The interfaces whose IP addresses fall into the 192.168.12.0/24 range to area 1
 The interfaces whose IP addresses fall into the 172.16.16.0/20 range to area 2
 The remaining interface being assigned to area 0.

```
Orion_B54Q(config)# routerospf 20
Orion_B54Q(config-router)# network172.16.16.0
0.0.15.255 area172.16.16.0
Orion_B54Q(config-router)# network192.168.12.0
0.0.0.255 area 1
Orion_B54Q(config-router)# network0.0.0.0 255.255.255.255 area0
```

Related Commands

Command	Description
router ospf	Creates the OSPF routing process.

Platform Description N/A

2.48 nsr

Use this command to enable the nonstop routing (NSR) function for the OSPF instance. Use the **no** form of this command to disable the NSR function.

Nsr
no nsr

Parameter Description

Parameter	Description
N/A	N/A

Defaults NSR is disabled by default.

Command Routing process configuration mode

Mode

Usage Guide NSR enables the device to recover link state and regenerate routes without the assistance from neighbors during active/standby switchover of distributed devices or VSU system. The backup information includes adjacencies and OSPF state.

You need to enable either NSR or GR in the same OSPF process. That is, the NSR feature will be disabled after the GR feature is enabled. Similarly, the GR feature will be disabled after NSR is enabled, and the GR Helper capability is still supported.

The active/standby switchover of distributed devices or VSU system takes a period of time. If the OSPF dead interval is less than the switchover period, OSPF neighbors will be disconnected and the services will be interrupted. It is recommended to configure the OSPF dead interval longer than its default value. It is not recommended to enable the Fast Hello feature after NSR is enabled, because OSPF dead interval is less than 1 second when the Fast Hello feature is enabled and the OSPF neighbors are disconnected and NSR becomes ineffective.

Configuration Examples The following example enables NSR.

```
Orion_B54Q(config)#router ospf 1
Orion_B54Q(config-router)# nsr
```

Related Commands

Command	Description
router ospf	Creates the OSPF routing process.

Platform N/A
Description

2.49 overflow database

Use this command to configure the maximum number of LSAs supported by the current OSPF instance. Use the **no** form of this command to restore the default setting.

overflow database *number* [**hard** | **soft**]

no overflow database

Parameter Description

Parameter	Description
<i>Number</i>	Maximum number of LSAs. The range is from 1 to 4294967294.
hard soft	hard: shuts down the OSPF instance when the number of LSAs exceeds that number. soft: issues an alarm when the number of LSAs exceeds that number.

Defaults The maximum number of LSAs supported by the current OSPF instance is not restricted by default.

Command Routing process configuration mode

Mode

Usage Guide To shut down the OSPF instance when the number of LSAs exceeds that number, use the hard parameter; otherwise, use the soft parameter.

Configuration Examples The following example configures that OSPF instance 10 will be shut down when there are more than 10 LSAs.

```
Orion_B54Q# config terminal
Orion_B54Q(config)# router ospf 10
Orion_B54Q(config-router)# overflow database 10 hard
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

2.50 overflow database external

Use this command to configure the maximum number of external LSAs and the waiting time from the overflow state to the normal state. Use the **no** form of this command to restore the default setting.

overflow database external *max-db-size* *wait-time*
no overflow database external

Parameter Description


Parameter	Description
<i>max-db-size</i>	Maximum number of external LSAs (the value shall be the same for all routing devices in the same AS). The range is from 0 to 2147483647.
<i>wait-time</i>	Waiting time of the routing device from the overflow status to normal status. The range is from 0 to 2147483647.

Defaults The maximum number of external-LSAs is not restricted by default.
If the maximum number of external-LSAs is restricted, the normal status cannot be restored when the maximum number is exceeded.

Command

Mode Routing process configuration mode

Usage Guide When the number of external-LSAs exceeds the value of max-db size, the device enters the overflow state. Then no more external-LSA will be loaded and the external-LSAs generated locally will be cleared. After wait-time expires, the device restores to the normal state and external-LSAs are reloaded.

 When using this function, ensure that all routers of the OSPF backbone area and common

areas use the same max-db size value. Otherwise, the following situations occur:

- ▲ The link status is inconsistent on the entire network and neighbors fail to achieve the Full state.
- ▲ Incorrect routes occur, including loops.
- ▲ AS-External-LSAs may be frequently retransmitted.

Configuration Examples

The following example configures that the maximum number of external LSAs is 10, and it turns to the overflow status upon timeout, and the time interval attempting to restore from the overflow state to the normal state is 3 seconds.

```
Orion_B54Q# configterminal
Orion_B54Q(config)# routerospf10
Orion_B54Q(config-router)# overflow database external10 3
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

2.51 overflow memory-lack

Use this command to allow OSPF to enter the OVERFLOW state when the memory lacks. Use the **no** form of this command to disable this function.

overflow memory-lack

no overflow memory-lack

Parameter Description

Parameter	Description
N/A	N/A

Defaults

This function is enabled by default

Command

Mode

Routing process configuration mode

Usage Guide

The action of OSPF entering the OVERFLOW state is to discard the newly-learned external route and effectively prevent the memory from increasing.

It is possible that enabling this function causes the route loop in the whole network. To reduce that possibility, OSPF will generate a default route directing to the NULL port and this default route will exist in the OVERFLOW state.

Use the **clear ip ospf process** command to reset the OSPF and remove the OSPF OVERFLOW state.

Use the no form of this command to prevent the OSPF to enter the OVERFLOW state when the memory is insufficient, which may result in the constantly consumption of the memory resources. If

the memory is exhausted to some degree, the OSPF instance will stop and all learned routes will be removed.

Configuration Examples The following example prevents the OSPF from entering the OVERFLOW state when the memory is insufficient.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# no overflow memory-lack
```

Related Commands

Command	Description
clear ip ospf process	Resets the OSPF instances.
show ip protocols ospf	Displays the OSPF information.

Platform N/A

Description

2.52 passive-interface

Use this command to configure the specified network interface or all interface as the passive interfaces. Use the **no** form of this command to restore the default setting.

passive-interface { **default** | *interface-type interface-number* | *interface-type interface-number ip-address* }

no passive-interface { **default** | *interface-type interface-number* | *interface-type interface-number ip-address* }

Parameter Description

Parameter	Description
<i>interface-type interface-number</i>	Interface to be set as a passive interface
Default	Sets all the interfaces as passive interfaces
<i>interface-type interface-number ip-address</i>	Sets the address of the specified interface as a passive address.

Defaults No interface is configured as a passive interface by default. All interfaces are allowed to receive or send OSPF packets.

Command

Mode Routing process configuration mode

Usage Guide

To prevent other devices in the network from dynamically learning the routing information of the device, set the specified network interface of this device as a passive interface or the IP address of the specified network interface as a passive address

Configuration Examples

The following example configures fastEthernet 0/1 as a passive interface and the IP address of the interface 1.1.1.1 as the passive address.

```
Orion_B54Q(config)# routerospf 30
```

```
Orion_B54Q(config-router)# passive-interface fastEthernet 0/1
Orion_B54Q(config-router)# passive-interface fastEthernet 0/1 1.1.1.1
```

Related Commands

Command	Description
show ip ospf interface	Displays the configuration information of the interface.

Platform N/A
Description



2.53 redistribute

Use this command to redistribute the external routing information. Use the **no** form of this command to restore the default setting.

redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static** } [{ **level-1** | **level-1-2** | **level-2** }] [**match** { **internal** | **external** [1|2] | **nssa-external** [1|2] }] [**metric** *metric-value*] [**metric-type** { 1|2 }] [**route-map** *route-map-name*] [**subnets**] [**tag** *tag-value*]
no redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static** } [{ **level-1** | **level-1-2** | **level-2** }] [**match** { **internal** | **external** [1|2] | **nssa-external** [1|2] }] [**metric** *metric-value*] [**metric-type** { 1|2 }] [**route-map** *route-map-name*] [**subnets**] [**tag** *tag-value*]

Parameter Description

Parameter	Description
Bgp	Redistribution from bgp
Connected	Redistribution from direct routes
isis [<i>area-tag</i>]	Redistribution from an IS-IS instance specified in area-tag
ospf <i>process-id</i>	Redistribution from an ospf instance specified in process-id in the range from 1 to 65,535
Rip	Redistribution from rip
Static	Redistribution from static routes
level-1 level-1-2 level-2	Configures IS-IS route redistribution. The parameter specifies a level, and routes of this level will be redistributed. Only level-2 IS-IS routes can be redistributed by default.
Match	Filters specified routes for configuring OSPF route redistribution. By default, all the OSPF routes are redistributed.
metric <i>metric-value</i>	Specifies the metric of an OSPF external LSA in the range from 0 to 16777214.
metric-type {1 2}	Sets the external routing type as E-1 or E-2.
route-map <i>route-map-name</i>	Redistribution filter rule
Subnets	Redistributes the routes of non standard networks.
tag <i>tag-value</i>	Sets the tag value of the routes redistributed to the OSPF in the range from 0 to 4294967295.

Defaults	<p>Redistribution configuration is not supported by default.</p> <p>If you configure OSPF redistribution, all subtype routes of the instance are redistributed.</p> <p>If you configure ISIS redistribution, all level-2 subtype routes of the instance are redistributed.</p> <p>In other cases, all routings of this type are redistributed.</p> <p>The default metric of the redistribution BGP route is 1. The default metric of LSAs generated by routes of other types is 20.</p> <p>The default value of metric-type is E-2.</p> <p>No route-map is associated by default.</p>
Command	
Mode	Route configuration mode
Usage Guide	<p>After the command is configured, the router will become an ASBR, and the related routing information is imported into the OSPF domain and broadcasted to other OSPF routers through type-5 LSAs.</p> <p>When you configure is route redistribution without the level parameter, level-2 routes can be redistributed by default. In initial redistribution configuration that carries the level parameter, routes of the specified level can be redistributed. When you save the configuration containing both level 1 and level 2, they are merged into level-1-2 for convenience. For details, see the configuration examples.</p> <p>When you configure OSPF router distribution without the match parameter, the OSPF routes of all sub types are redistributed by default. Then the first configured match parameter is used as the original one. Only the routes matching the specific type can be redistributed. Use the no form of this command to restore the default configuration.</p> <p>When you filter routes for redistribution by following the route-map rule, the match rule of the route-map rule is specific for the original redistribution parameters. The route-map rule works only when the redistributed OSPF routes follow the match rule.</p> <hr/> <p> The range of set metric is from 0 to 16777214 for the associated route-map. If the value exceeds the range, introducing a route fails.</p> <p> The following are the rules for configuring the no form of the redistribute command:1. If the no form specifies some parameters, restore their default values.2. If the no form contains no parameter, delete the whole command. If the following configuration exists: redistribute isis 112 level-2 You can use the no redistribute isis 112 level-2command to modify the configuration. According to preceding rules, this command restores the level-2 parameter to the default value, namely level-2. Therefore, the configuration remains the same after the no form of the preceding command is executed. redistribute isis 112 level-2 To delete the whole command, use the following command: no redistribute isis 112</p> <hr/>
Configuration Examples	<p>The following example redistributes routes of ospf2 and isis isis-001 to the OSPF area.</p> <pre>Orion_B54Q(config)# router ospf1 Orion_B54Q(config-router)# redistribute ospf 2 subnets Orion_B54Q(config-router)# redistribute ospf2match external 1 internal</pre>

```
Orion_B54Q(config-router)# redistribute isisis-001
Orion_B54Q(config-router)# redistribute isisis-001 level-1
```

The following example displays the output of the **show run** command.

```
router ospf 1
redistribute ospf 2 match external 1 internal subnets
redistribute isis isis-001 level-1-2
```

Related Commands

Command	Description
summary-address	Configures the aggregate route for the external route of the OSPF route area.
default-metric	Sets the default metric of the OSPF redistribution route.

Platform N/A

Description

2.54 router ospf

Use this command to create the OSPF routing process in global configuration mode. Use the **no** form of this command to restore the default setting.

router ospf

router ospf *process-id* [**vrf** *vrf-name*]

no router ospf *process-id*

Parameter Description

Parameter	Description
<i>process-id</i>	ID of an OSPF process. If the process ID is not configured, process 1 is configured.
<i>vrf-name</i>	VRF of the configured OSPF process for products that support the VRF.

Defaults No OSPF routing process exists by default.

Command

Mode Global configuration mode

Usage Guide

Based on the original implementation, the NOS10.1 adds the routing process ID to multi-instance OSPF. Different OSPF instances are mutually independent and can be approximately considered as two routing protocols that run independently.

Configuration Examples

The following example creates the OSPF routing process 10 within the specified vrf: vpn_1.

```
Orion_B54Q(config)# router ospf10 vrf: vpn_1
```

Related

Command	Description
---------	-------------

Commands		
	show ip protocols	Displays the routing protocol information.
	show ip ospf	Displays the OSPF information.

Platform N/A
Description

2.55 router ospf max-concurrent-dd

Use this command to specify the maximum number of DD packets that can be processed (initiated or accepted) at the same time. Use the **no** form of this command to restore the default setting.

router ospf max-concurrent-dd *number*
no router ospf max-concurrent-dd

Parameter Description	Parameter	Description
	<i>Number</i>	Maximum number of DD packets in the range from 1 to 65535.

Defaults The default is 10.

Command Mode Global configuration mode

Usage Guide When a routing device is exchanging data with multiple neighbors, its performance will be affected. This command is configured to limit the maximum number of DD packets that each OSPF instance can have (initiated or accepted) at the same time.

Configuration Examples The following example sets the maximum number of DD packets to 4. After the configuration, the device can initiate to interact with four neighbors and can concurrently accept the interaction. That is, the device can interact with a maximum of eight neighbors.

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router ospfmax-concurrent-dd4
```

Related Commands	Command	Description
	max-concurrent-dd	Sets the maximum number of the neighbors that the OSPF routing process can concurrently interact with.

Platform N/A
Description

2.56 router-id

Use this command to set the router ID. Use the **no** form of this command to restore the default

setting.
router-id *router-id*
no router-id

Parameter Description	Parameter	Description
	<i>router-id</i>	Router ID in IP address form

Defaults The OSPF routing process will select the maximal interface IP address as the router ID by default. If the loopback interface of an IP address is not configured, the OSPF routing process will select the maximum IP address among all its physical interfaces as the router ID.

Command

Mode Routing process configuration mode

Usage Guide You can configure any IP address as the router ID. However, the router ID should be unique. Note that once the router ID changes, the OSPF protocol will do a lot of processing. Therefore, it is not recommended to change the router ID. The device can be changed only when no LSA is generated.

Configuration Examples The following example modifies the router ID to 0.0.0.36.

```
Orion_B54Q(config)# router ospf 20
Orion_B54Q(config-router)# router-id 0.0.0.36
```

Related Commands	Command	Description
	show ip protocols	Displays the routing protocol information.

Platform N/A
Description

2.57 show ip ospf

Use this command to display the OSPF information.

show ip ospf [*process-id*]

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF process ID

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command displays the information of the OSPF routing process.

Configuration The following example displays the output of the **show ip ospf** command.

n Examples

```
Orion_B54Q# show ip ospf
Routing Process "ospf 1" with ID 1.1.1.1
Domain ID type 0x0105, value 0x010101010101
Process uptime is 4 minutes
Process bound to VRF default
Memory Overflow is enabled.
Router is not in overflow state now.
Conforms to RFC2328, and RFC1583Compatibility flag isenabled
Supports only single TOS(TOS0) routes
Enable two-way-maintain
Supports opaque LSA
Supports Graceful Restart
This router is an ASBR (injecting external routing information)
Originating router-LSAs with maximum metric
Condition:on startup for 100 seconds, State:inactive
Advertise stub links with maximum metric in router-LSAs
Advertise summary-LSAs with metric 16711680
Advertise external-LSAs with metric 16711680
Unset reason:timer expired, Originated for 100 seconds
Unset time:00:02:02.080, Time elapsed: 00:23:54.656
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Initial LSA throttle delay 0 msec
Minimum hold time for LSA throttle 5000 msec
Maximum wait time for LSA throttle 5000 msec
Lsa Transmit Pacing timer 40 msec, 10 LS-Upd
Minimum LSA arrival 1000 msec
Pacing lsa-group:240 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 4. Checksum 0x0278E0
Number of opaque AS LSA 0. Checksum 0x000000
Number of non-default external LSA 4
External LSA database is unlimited.
Number of LSA originated 6
Number of LSA received 2
Log Neighbor Adjacency Changes :Enabled
Graceful-restart disabled
Graceful-restart helper support enabled
Number of areas attached to this router: 1
BFD enabled
Area 0 (BACKBONE)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 1
Area has no authentication
```

```

SPF algorithm last executed 00:01:26.640 ago
SPF algorithm executed 4 times
Number of LSA 3. Checksum 0x0204bf
Area 1 (NSSA)
Number of interfaces in this area is 1(1)
Number of fully adjacent neighbors in this area is 0
Number of fully adjacent virtual neighbors through this area is 0
Area has no authentication
SPF algorithm last executed 02:09:23.040 ago
SPF algorithm executed 4 times
Number of LSA 6. Checksum 0x028638
NSSA Translator State is disabled, Stability Interval expired in 00:00:03
    
```

Field	Description
Router ID	ID of a router.
Process uptime	Effective time of the current OSPF process (the process does not take effect when device-id is 0.0.0.0)
Bou to VRF	VRF of the current OSPF
Conforms to RFC2328	Same as the RFC2328
RFC1583Compatibilit flag	Whether the RFC1583 or RFC2328 is adopted for the calculation of external routes. This policy is used in the selection of best ASBR and in the route comparison.
Support Tos	Supports Only TOS0.
Supports opaque LSA	Supports opaque-LSA.
Graceful-restart	GR Restart capability described in the RFC3623 Graceful Restart
Graceful-restart helper	GR Help capability described in the RFC3623 Graceful Restart
Router Type	OSPF device type, including normal, ABR, and ASBR
SPF Delay	Delay before the SPF calculation is invoked after the topology change is received
SPF-holdtime	Minimum holdtime between two SPF calculations
LsaGroupPacing	Parameter used for LSA pacing, checksum calculation, and aging interval
Incomming current DD	Number of neighbors under interaction. The incoming

Field	Description
exchange neighbors	neighbors are those entering the exstart status for the first time.
Outgoing current DD exchange neighbors	Number of neighbors under interaction. The outgoing neighbors are those exiting from the higher status to the exstart status for re-interaction.
Number of external LSA	Number of external LSAs stored in the database
External LSA Checksum Sum	Checksum sum of external LSAs stored in the database
Number of opaque LSA	Number of external LSAs stored in the database
Opaque LSA Checksum Sum	Checksum sum of external LSAs stored in the database
Number of non-default external LSA	Number of external LSAs with non-default routes
External LSA database limit	Limit of external LSA number
Exit database overflow state interval	Time of exiting the overflow status
Database overflow state	Whether the current OSPF process is in the overflow status
Number of LSA originated	Number of LSAs generated
Number of LSA received	Number of LSAs received
Log Neighbor Adjency Changes	Whether the record switch for neighbor status change is enabled
Number of areas attached to this router	Total number of areas on the devices
Area type	Area type, including normal, stub, and nssa
Number of interfaces in this area	Number of interfaces in this area
Number of fully adjacent neighbors in this area	Number of Full neighbors of the area
Number of fully adjacent virtual neighbors through this area	Number of Full neighbors with virtual connections in the area. It is effective only in the non-backbone default-type areas.
Area authentication	Authentication mode of the area
SPF algorithm last	Time from the previous SPF calculation to the current time

Field	Description
executed	
SPF algorithm executed times	Times of SPF calculations
Number of LSA	Total number of LSAs in this area
Checksum Sum	Checksum sum of the LSAs in the area
NSSATranslatorState	Whether to convert the NSSA LSA to External LSA. It is effective on the ABR OSPF process in the NSSA.
BFD enabled	Enables BFD for OSPF.

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

2.58 show ip ospf border-routers

Use this command to display the OSPF internal routing table on the ABR/ASBR.

show ip ospf [*process-id*] border-mrouters

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF process ID

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command displays the OSPF internal routes from the local routing device to the ABR or ASBR. The OSPF internal routing table is different from the one displayed with the show ip route command. The OSPF internal routing table has the destination address of the router ID instead of the destination network.

Configuration Examples The following example displays the output of the **show ip ospf border-mrouters** command.

```
Orion_B54Q# show ip ospf border-routers
OSPF internal Routing Table
```

```
Codes:i - Intra-area route, I - Inter-area route
i 1.1.1.1 [2] via 10.0.0.1, FastEthernet 0/1, ABR, ASBR, Area 0.0.0.1
select
```

The following table describes fields in the output.

Field	Description
Codes	Route type code, where “i” means intra-area routes, while “I” means inter-area routes.
I	Intra-area routes
1.1.1.1	Displays the OSPF ID of the border device.
[2]	Displays the cost to the border device.
via 10.0.0.1	Displays the next-hop gateway to the border device.
FastEthernet 0/1	Displays the interface to the border device.
ABR, ASBR	Displays the type of the border device, including ABR, ASBR, or both.
Area 0.0.0.1	Displays the area that learns the route.
Select	Indicates the currently selected optimal path when there are multiple paths to the ASBR.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

2.59 show ip ospf database

Use this command to display the OSPF link state database information. Use the **no** form of this command to restore the default setting.

Different formats of the command will display different LSA information.

show ip ospf [process-id area-id] database [adv-router ip-address] [{ asbr-summary | external | network | nssa-external | opaque-area | opaque-as | opaque-link | router | summary } [link-state-id] [{ adv-router ip-address | self-originate }]] database-summary | max-age | self-originate | detail | brief]

Parameter Description

Parameter	Description
<i>area-id</i>	(Optional) Displays the area ID.
adv-device	(Optional) Displays the LSA information generated by the specified advertising device.
<i>link-state-id</i>	(Optional) Displays the LSA information of the specified OSPF link state identifier.

self-originate	(Optional) Displays the LSA information generated by the device itself.
Max-age	(Optional) Displays the LSAs aged.
router	(Optional) Displays the OSPF device LSA information.
network	(Optional) Displays the OSPF network LSA information.
summary	(Optional) Displays the OSPF summary LSA information.
asbr-summary	(Optional) Displays the ASBR summary LSA information.
external	(Optional) Displays the OSPF external LSA information.
nssa-external	(Optional) Displays the category 7 OSPF external LSA information.
opaque-area	(Optional) Displays type 10 LSAs.
opaque-as	(Optional) Displays type 11 LSAs.
opaque-link	(Optional) Displays type 9 LSAs.
database-summary	(Optional) Displays the statistics of LSAs of the link state database.
detail	Displays detailed information of LSAs of the OSPF.
brief	Displays the brief information of the LSAs of the specified type.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide When the OSPF link state database is very large, you should display the information on the link state database by item. Proper use of commands may help OSPF troubleshooting.

Configuration Examples The following example displays the output of the **show ip ospf database** command.

```

Orion_B54Q# show ip ospf database
OSPF Device with ID (1.1.1.1) (Process ID 1)
Device Link States (Area 0.0.0.0)
Link ID          ADV Device      Age  Seq#          CkSum  Link count
1.1.1.1          1.1.1.1         2   0x80000011  0x6f39  2
3.3.3.3          3.3.3.3        120 0x80000002  0x26ac  1
Network Link States (Area 0.0.0.0)
Link ID          ADV Device      Age  Seq#          CkSum
192.88.88.27    1.1.1.1         120 0x80000001  0x5366
Summary Link States (Area 0.0.0.0)
Link ID          ADV Device      Age  Seq#          CkSum  Route
10.0.0.0         1.1.1.1         2   0x80000003  0x350d  10.0.0.0/24
100.0.0.0        1.1.1.1         2   0x8000000c  0x1ecb  100.0.0.0/16
Device Link States (Area 0.0.0.1 [NSSA])
Link ID          ADV Device      Age  Seq#          CkSum  Link count
1.1.1.1          1.1.1.1         2   0x80000001  0x91a2  1
Summary Link States (Area 0.0.0.1 [NSSA])
Link ID          ADV Device      Age  Seq#          CkSum  Route
100.0.0.0        1.1.1.1         2   0x80000001  0x52a4  100.0.0.0/16
    
```



```

192.88.88.0      1.1.1.1      2      0x80000001 0xbb2d 192.88.88.0/24
NSSA-external Link States (Area 0.0.0.1 [NSSA])
Link ID          ADV Device    Age  Seq#          CkSum  Route
Tag
20.0.0.0        1.1.1.1      1    0x80000001 0x033c E2 20.0.0.0/24
0
100.0.0.0       1.1.1.1      1    0x80000001 0x9469 E2 100.0.0.0/28
0
AS External Link States
Link ID          ADV Device    Age  Seq#          CkSum  Route
Tag
20.0.0.0        1.1.1.1      380  0x8000000a 0x7627 E2 20.0.0.0/24
0
100.0.0.0       1.1.1.1      620  0x8000000a 0x0854 E2 100.0.0.0/28
0
    
```

The following table describes the fields in the output of the **show ip ospf database** command.

Field	Description
OSPF Device with ID	Displays the Router ID.
Device Link States	Displays the device LSA information.
Net Link States	Displays the network LSA information.
Summary Net Link States	Displays the summary network LSA information.
NSSA-external Link States	Displays the type 7 autonomous external LSA information.
AS External Link States	Displays the type 5 autonomous external LSA information.
Link ID	Displays the Link ID.
ADV Device	Displays the ID of the device that advertises the LSAs.
Age	Displays the keepalive period of the LSA.
Seq#	Displays the sequence number of the LSA, which is used to check aged or duplicate LSAs.
Cksum	Displays the checksum of LSAs.
Link-Count	Displays the number of links in the device LSA information.
Route	Displays the device information included in the LSA.
Tag	Displays the tag of the LSA.

The following example displays the output the **show ip ospf database asbr-summary** command.

```

Orion_B54Q# show ip ospf database asbr-summary
      OSPF Device with ID (1.1.1.35) (Process ID 1)
          ASBR-Summary Link States (Area 0.0.0.1)
LS age: 47
    
```

```
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: ASBR-summary-LSA
Link State ID: 3.3.3.3 (AS Boundary Device address)
Advertising Device: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0xbe8c
Length: 28
Network Mask: /0
    TOS: 0 Metric: 1
```

The following table describes the fields in the output of the **show ip ospf database asbr-summary** command.

Field	Description
OSPF Device with ID	Displays the router ID.
AS Summary Link States	Displays the summary LSA information in the AS.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
AdvertisingRouter	Displays the device advertising the LSA.
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of the LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the route corresponding to the LSA.
TOS	TOS value, which can be only 0 now.
Metric	Displays the metric of the route corresponding to the LSA.

The following example displays the output of the **show ip ospf database external** command.

```
Orion_B54Q# show ip ospf database external
    OSPF Device with ID (1.1.1.35) (Process ID 1)
        AS External Link States
LS age: 752
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Device: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
    Metric Type: 2 (Larger than any link state path)
```

```
TOS: 0
Metric: 20
Forward Address: 0.0.0.0
External Route Tag: 0
```

The following table describes the fields in the output of the **show ip ospf database external** command.

Field	Description
OSPF Device with ID	Displays the router ID.
Type-5 AS External Link States	Displays autonomous external LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Router	Displays the device advertising the LSA
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of the LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the route corresponding to the LSA.
Metric Type	Indicates the external link type.
TOS	TOS value, which can be 0 only now.
Metric	Displays the metric of the route corresponding to the LSA.
Forward Address	IP address through which traffic is forwarded to the destination network. If this address is 0.0.0.0, the data traffic will be forwarded to the device that generates the link state.
External Route Tag	External route tag. Each external route has a 32-byte route tag. The OSPF does not use the route tag by itself, but it will be used by other routing processes to redistribute OSPF routes.

The following example displays the output of the **show ip ospf database network** command:

```
Orion_B54Q# show ip ospf database network
OSPF Router with ID (1.1.1.1) (Process ID 1)
Network Link States (Area 0.0.0.0)
LS age: 572
Options:0x2 (*|---|---|E|)
LS Type:network-LSA
Link State ID:192.88.88.27 (address of Designated Router)
Advertising Router:1.1.1.1
LS Seq Number: 8000001
```

```
Checksum:0x5366
Length: 32
Network Mask: /24
Attached Router:1.1.1.1
Attached Router:3.3.3.3
```

The following table describes the fields in the output of the **show ip ospf database network** command.

Field	Description
OSPF Router with ID	Displays the router ID corresponding to the follow-up information and the process ID corresponding to the OSPF.
Network LinStates	Displays the network LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Device	Displays the device advertising the LSA.
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the network corresponding to the LSA.
Attached Router	Displays the device that is connected with the network.

The following example displays the output of the **show ip ospf database device** command:

```
Orion_B54Q# show ip ospf database router
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Link States (Area 0.0.0.0)
LS age: 322
Options:0x2 (*|---|---|E|)
Flags:0x3 :ABR ASBR
LS Type:router-LSA
Link State ID:1.1.1.1
Advertising Router:1.1.1.1
LS Seq Number: 80000012
Checksum:0x6d3a
Length: 48
Number of Links: 2
Link connected to:Stub Network
(Link ID) Network/subnet number: 100.0.1.1
(Link Data) Network Mask: 255.255.255.255
Number of TOS metrics: 0
TOS 0 Metric: 0
```

The following table describes the fields in the output of the **show ip ospf database device** command.

Field	Description
OSPF Device with ID	Displays the router ID.
Device Link States	Displays the device LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
Flag	Flag
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Router	Displays the device advertising the LSA.
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of LSAs.
Length	Displays the length (in bytes) of the LSA.
Number of Links	Displays the number of links associated with the device.
Link connected to	Displays what the link is connected to and the network type.
(Link ID)	Link identifier
(Link Data)	Link data
Number of TOS metrics	TOS value, supporting TOS0 only
TOS 0 Metrics	TOS0 metric

The following example displays the output of the **show ip ospf database summary** command:

```
Orion_B54Q# show ip ospf database summary
    OSPF Device with ID (1.1.1.1) (Process ID 1)
        Summary Link States (Area 0.0.0.0)
LS age: 499
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.0.0.0 (summary Network Number)
Advertising Device: 1.1.1.1
LS Seq Number: 80000004
Checksum: 0x330e
Length: 28
```

```
Network Mask: /24
      TOS: 0  Metric: 11
```

The following table describes the fields in the output of the **show ip ospf database summary** command.

Field	Description
OSPF Router with ID	Displays the router ID.
Summary Net Link States	Displays the summary network LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Router	Displays the device advertising the LSA.
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the route corresponding to the LSA.
TOS	TOS value, supporting only 0 now
Metric	Displays the metric of the route corresponding to the LSA.

The following example displays the output of the **show ip ospf database nssa-external** command:

```
Orion_B54Q# show ip ospf database nssa-external
      OSPF Device with ID (1.1.1.1) (Process ID 1)
NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 1
Options: 0x0 (*|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 20.0.0.0 (External Network Number For NSSA)
Advertising Device: 1.1.1.1
LS Seq Number: 80000001
Checksum: 0x033c
Length: 36
Network Mask: /24
      Metric Type: 2 (Larger than any link state path)
      TOS: 0
```

```
Metric: 20
NSSA: Forward Address: 100.0.2.1
External Route Tag: 0
```

The following table describes the fields in the output of the **show ip ospf database nssa-external** command.

Field	Description
OSPF Router with ID	Displays the router ID.
NSSA-external Link States	Displays the type 7 autonomous external LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Router	Displays the device advertising the LSA.
LS Seq Number	Displays the sequential number of the LSA.
Checksum	Displays the checksum of the LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the route corresponding to the LSA.
Metric Type	Displays the metric type.
TOS	TOS value, which can be 0 only now.
Metric	Displays the metric of the route corresponding to the LSA.
NSSA:Forward Address	IP address through which traffic is forwarded to the destination network. If this address is 0.0.0.0, the data traffic will be forwarded to the device that generates the link state.
External Route Tag	External route tag. Each external route has a 32-byte route tag. The OSPF does not use the route tag by itself, but it will be used in redistributing OSPF routes by other routing process.

The following example displays the output of the **show ip ospf database external** command:

```
Orion_B54Q# show ip ospf database external
    OSPF Device with ID (1.1.1.1) (Process ID 1)
```

```

AS External Link States
LS age: 1290
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external-LSA
Link State ID: 20.0.0.0 (External Network Number)
Advertising Device: 1.1.1.1
LS Seq Number: 8000000a
Checksum: 0x7627
Length: 36
Network Mask: /24
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 20
    Forward Address: 0.0.0.0
    External Route Tag: 0
    
```

The following table describes the fields in the output of the **show ip ospf database external** command.

Field	Description
OSPF Device with ID	Displays the router ID.
Type-7 AS External Link States	Displays the type 7 autonomous external LSA information.
LS age	Displays the keepalive period of the LSA.
Options	Option
LS Type	Displays the type of the LSA.
Link State ID	Displays the link ID of the LSA.
Advertising Router	Displays the device advertising the LSA.
LS Seq Number	Displays the sequence number of the LSA.
Checksum	Displays the checksum of the LSAs.
Length	Displays the length (in bytes) of the LSA.
Network Mask	Displays the network mask of the route corresponding to the LSA.
Metric Type	Displays the metric type.
TOS	TOS value, which can be 0 only now.
Metric	Displays the metric of the route corresponding to the LSA.

Forward Address	IP address through which traffic is forwarded to the destination network. If this address is 0.0.0.0, the data traffic will be forwarded to the device that generates the link state.
External Route Tag	External route tag. Each external route has a 32-byte route tag. The OSPF does not use the route tag by itself, but it will be used in redistributing OSPF routes by other routing process.

The following example displays the output of the **show ip ospf database database-summary** command:

```
Orion_B54Q# show ip ospf database database-summary
OSPF process 1:
Device Link States      : 4
Network Link States    : 2
Summary Link States    : 4
ASBR-Summary Link States : 0
AS External Link States : 4
NSSA-external Link States: 2
```

The following table describes the fields in the output of the command **show ip ospf database database-summary**.

Field	Description
OSPF Process	OSPF process ID
Router Link	Number of device LSAs in the area
Network Link	Number of network LSAs in the area
Summary Link	Number of summary LSAs in the area
ASBR-Summary Link	Number of ASBR summary LSAs in the area
AS External Link	Number of NSSA LSAs in the area
NSSA-external Link	Number of NSSA LSAs in the area

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

2.60 show ip ospf interface

Use this command to display the OSPF-associated interface information.

show ip ospf [process-id] interface [interface-type interface-number | brief]

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF process ID
	<i>interface-type</i>	(Optional) type of the specified interface
	<i>interface-number</i>	(Optional) number of the specified interface
	brief	Displays the summary of the interface.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command displays the OSPF information on the interface.

Configuration Examples The following example displays the output of the **show ip ospf interface fastEthernet 0/1** command:

```
Orion_B54Q# show ip ospf interface fastEthernet0/1
FastEthernet 0/1 is up, line protocol is up
Internet Address 192.88.88.27/24, Ifindex 4, Area 0.0.0.0, MTU 1500
Matching network config: 192.88.88.0/24
Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1,BFD enabled
Designated Router (ID) 1.1.1.1, Interface Address 192.88.88.27
Backup Designated Router (ID) 3.3.3.3, Interface Address 192.88.88.72
Timer intervals configured,Hello 10,Dead 40,Wait 40,Retransmit 5
Hello due in 00:00:03
Neighbor Count is 1, Adjacent neighbor count is 1
Crypt Sequence Number is 70784
Hello received 1786 sent 1787, DD received 13 sent 8
LS-Req received 2 sent 2, LS-Upd received 29 sent 53
LS-Ack received 46 sent 23, Discarded 1
```

The following table describes the fields in the output of the **show ip ospf interface serial 1/0** command.

Field	Description
FastEthernet 0/1 State	State of the network interface; UP means normal working and Down means faults.
Internet Address	Interface IP address
Area	OSPF area of the interface

MTU	Corresponding MTU
Matching network config	Network area configured for the corresponding OSPF
Process ID	Corresponding process ID
Router ID	OSPF router id
Network Type	OSPF network type
Cost	OSPF interface cost
Transmit Delay is	OSPF interface transmit delay
State	DR/BDR state ID
Priority	Priority of the interface
Designated Router(ID)	DR ID of the interface
DR's Interface address	Address of the DR of the interface
Backup designated device(ID)	Router ID of the BRD of the interface
BDR's Interface address	Address of the BDR of the interface
Time intervals configured	Hello, Dead, Wait, and Retransmit intervals of the interface
Hello due in	Time when the previous Hello is sent
Neighbor count	Total number of neighbors
Adjacent neighbor count	Number of Full neighbors
Crypt Sequence Number	The corresponding md5 authentication number of the interface
Hello received send	Statistics on the Hello packets sent and received
DD received send	Statistics on the DD packets sent and received
LS-Req received send	Statistics on the LS request packets sent and received
LS-Upd received send	Statistics on the LS update packets sent and received
LS-Ack received send	Statistics on the LS response packets sent and received
Discard	Statistics on the discarded OSPF packets
BFD enabled	Enables BFD for OSPF.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

2.61 show ip ospf ispf

Use this command to display the ISPF calculation count in the OSPF area.

show ip ospf [*process-id*] **ispf**

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF process ID

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command displays the ISPF calculation count in the OSPF area within the last 30 minutes and total ISPF calculation count by now.

Configuration Examples The following displays the ISPF calculation count in the OSPF area.

```
Orion_B54Q# show ip ospf 1 ispf

OSPF process 1:
Area_id      30min_counts  Total_counts
0             32             1235
1             6              356
```

Field Description:

Field	Description
Area_id	OSPF area ID.
30min_counts	ISPF calculation count in the OSPF area within the last 30 minutes.
Total_counts	Total count of ISPF calculation.

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

2.62 show ip ospf neighbor

Use this command to display the OSPF neighbor list.

show ip ospf [*process-id*] **neighbor** [**statistics**] { [*interface-type interface-number*] | [*neighbor-id*] } [**detail**] }

Parameter Description	Parameter	Description
	detail	(Optional) Displays the neighbor details.
	<i>interface-type interface-number</i>	(Optional) Displays the neighbor information of the specified interface
	<i>neighbor-id</i>	(Optional) Displays the information of the specified neighbor
	statistics	(Optional) Displays the neighbor statistics.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command displays neighbor information usually used to check whether the OSPF is running normally.

Configuration Examples The following example displays the output of the **show ip ospf neighbor** command.

```

Orion_B54Q# show ip ospf neighbor
OSPF process 1, 1 Neighbors, 1 is Full:
Neighbor ID    Pri   State     BFD State   Dead Time   Address
Interface
3.3.3.3        1     Full/BDR  Up          00:00:32   192.88.88.72
FastEthernet 0/1

Orion_B54Q# show ip ospf neighbor detail
Neighbor 3.3.3.3, interface address 192.88.88.72
In the area 0.0.0.0 via interface FastEthernet 0/1
Neighbor priority is 1, State is Full, 11 state changes
DR is 192.88.88.27, BDR is 192.88.88.72
Options is 0x52 (*|O|-|EA|-|-|E|-)
Dead timer due in 00:00:32
Neighbor is up for 05:11:27
Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission off
Thread Poll Timer on
Graceful-restart helper disabled
BFD session state up
    
```

The following table describes the fields in the output of the **show ip ospf neighbor** command.

Field	Description
-------	-------------

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

2.63 show ip ospf route

Use this command to display the OSPF routes.

show ip ospf [process-id] route [count]

Parameter Description	Parameter	Description
		<i>process-id</i>
	count	Statistics of various OSPF routes

Defaults N/A

Command

Mode Privileged mode

Usage Guide This command displays the OSPF routing information. The count option displays the OSPF routing statistics.

Configuration Examples The following example displays the output of the **show ip ospf route** command.

```

OSPF process 1:
Codes: C - connected, D - Discard , 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
E2 100.0.0.0/24 [1/20] via 192.88.88.126, FastEthernet 0/1
C 192.88.88.0/24 [1] is directly connected, FastEthernet 0/1, Area 0.0.0.1
    
```

The following table describes the fields in the output of the **show ip ospf route** command.

Field	Description
codes	Route type and corresponding abbreviation and description
100.0.0.0/24	Route prefix
[1]	Route cost
via	Route next hop and interface

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

2.64 show ip ospf spf

Use this command to display the routing count in the OSPF area.

show ip ospf [process-id] spf

Parameter Description	Parameter	Description
	<i>process-id</i>	OSPF process ID

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command displays the routing counts within the latest 30 minutes in the OSPF area and current routing total counts.

Configuration Examples The following example displays the output of the **show ip ospf [process-id] spf** command:

```
Orion_B54Q# show ip ospf 1 spf

OSPF process 1:
Area_id      30min_counts  Total_counts
0             32             1235
1             6              356
```

The following table describes the fields in the output of the **show ip ospf [process-id] spf** command.

Field	Description
Area_id	OSPF area ID
30min_counts	OSPF routing counts within the latest 30 minutes
Total_counts	Total counts of the OSPF routing till now

Related Commands	Command	Description
	show ip ospf	Displays the OSPF summary.

Platform N/A
Description

2.65 show ip ospf summary-address

Use this command to display the converged route of all redistributed routes.

show ip ospf [*process-id*] summary-address

Parameter Description	Parameter	Description
	<i>process-id</i>	ID of the OSPF process. All OSPF routing processes will be displayed if this parameter is not configured.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command is valid only on the NSSA ABR, and displays only the routes with local aggregation operations.

Configuration Examples The following example displays the output of the **show ip ospf summary-address** command:

```
Orion_B54Q# show ip ospf summary-address
Summary Address Summary Mask Advertise Status Aggregated subnets
-----
202.101.0.0      255.255.0.0      advertise         Inactive 0
```

Field	Description
Summary Address	IP address to be aggregated
Summary Mask	Mask to be aggregated
Advertise	Whether to advertise the aggregated route
Status	Whether the aggregation range takes effect
Aggregated subnets	Number of external routes included in the aggregation range

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

2.66 show ip ospf topology

Use this command to display topology information for OSPF SPF calculation.

show ip ospf [*process-id area-id*] topology [*adv-router ip-address* | *self-originate*]

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
<i>process-id</i>	OSPF process ID.
<i>area-id</i>	Displayed area ID
topology	Displays a specified OSPF process and topology information summary of an area.
adv-router	Displays topology information of a specified device. This specified device must be a directly connected neighbor of the current device.
self-originate	Displays topology information of the current device.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command helps users to understand OSPF SPF calculation topology information and troubleshoot faults caused by topology planning. If the user enables fast reroute calculation, this command displays information related to fast reroute calculation.

Configuration Examples The following example displays the result of the show **ip ospf topology** command:

```

Orion_B54Q# show ip ospf topology
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Topology States (Area 0.0.0.0)
+1.1.1.1
  +2.2.2.2
    +4.4.4.4
  +3.3.3.3
    +4.4.4.4

+2.2.2.2
  +1.1.1.1
    +3.3.3.3
  +4.4.4.4
    +3.3.3.3

+3.3.3.3
  +1.1.1.1
    +2.2.2.2
  +4.4.4.4

+2.2.2.2
  
```

The following example displays the result of the **show ip ospf topology self-originate** command:

```

Orion_B54Q# show ip ospf topology self-originate
OSPF Router with ID (1.1.1.1) (Process ID 1)
Router Topology States (Area 0.0.0.0)
1.1.1.1
  Self to Destination Metric: 0
  
```

```

Parent Node: -
Child Node:2.2.2.2
    Primary next-hop: -
    Backup next-hop: -
    Backup Neighbor: -

2.2.2.2
    Self to Destination Metric: 1
Parent Node: 1.1.1.1
Child Node:-
    Primary next-hop: FastEthernet 0/1 via 10.0.0.1
    Backup next-hop: FastEthernet 0/2 via 10.0.1.1
    Backup Neighbor: 2.2.2.2
Neighbor to Destination Metric: 0
Neighbor to Self Metric: 10
Neighbor to Primary Neighbor: 0
Self to Neighbor Metric: 1
    
```

The description of every field displayed by **show ip ospf topology self-originate** is as follows:

Field	Description
Self to Destination Metric	Metric from the root node to the current destination node
Parent Node	Parent node of the current destination node
Child Node	Child node of the current destination node
Primary next-hop	Primary next hop for reaching the current the destination node
Backup next-hop	Backup next hop for reaching the current the destination node
Backup Neighbor	Backup neighbor for reaching the current the destination node
Neighbor to Destination Metric	Metric from the backup neighbor to the current destination node
Neighbor to Self Metric	Metric from the backup neighbor to the root node
Neighbor to Primary Neighbor	Metric from the backup neighbor to the primary neighbor
Self to Neighbor Metric	Metric from the root node to the backup neighbor

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

2.67 show ip ospf virtual-links

Use this command to display the OSPF virtual link information.

show ip ospf [*process-id*] **virtual-links** [*ip-address*]

Parameter Description	Parameter	Description
	<i>process-id</i>	ID of the OSPF process. All OSPF routing processes will be displayed if this parameter is not configured.
	<i>ip-address</i>	Associated ID of a virtual link neighbor

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide If no virtual link is configured, the command displays the neighbor status and other related information. The show ip ospf neighbor command does not display the neighbor of the virtual link.

Configuration Examples The following is the output of the **show ip ospf virtual-links** command:

```
Orion_B54Q# show ip ospf virtual-links
Virtual Link VLINK0 to device 1.1.1.1 is up
Transit area 0.0.0.1 via interface FastEthernet 0/1
Local address 10.0.0.37/32
Remote address 10.0.0.27/32
Transmit Delay is 1 sec, State Point-To-Point,
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:05
Adjacency state Full
```

The following table describes the fields in the output.

Field	Description
Virtual Link VLINK0 to router	Displays the virtual link neighbors and their status.
Virtual Link State	Displays the virtual link state.
Transit area	Displays the transit area of the virtual link.
via interface	Displays the associated interface of the virtual link.
Local address	Local interface address
Remote Address	Peer interface address
Transmit Delay	Displays the transmit delay of the virtual link.
State	Interface state
Time intervals configured	Hello, Dead, Wait, and Retransmit interval of the interface

Adjacency State	Neighbor state, where FULL means the stable state
-----------------	---

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

2.68 summary-address

Use this command to configure the aggregate route out of the OSPF routing domain. Use the **no** form of this command to restore the remove the aggregate route.

summary-address *ip-address net-mask* [**not-advertise** | **tag value** | **cost cost**]
no summary-address *ip-address net-mask* [**not-advertise** | **tag** | **cost**]

Parameter Description

Parameter	Description
<i>ip address</i>	IP address of the aggregate route
<i>net-mask</i>	Network mask of the aggregate route
not-advertise	Does not advertise the aggregate route. If the parameter is not configured, the aggregate route is advertised.
tag value	Sets the tag value of an aggregate route. The range is from 0 to 4,294,967,295.
cost cost	Cost value of the aggregate route. The range is from 0 to 16,777,214.

Defaults No aggregate route is configured by default.

Command

Mode Routing process configuration mode

Usage Guide

When routes are redistributed by another routing process into the OSPF routing process, every route is advertised to the OSPF-enabled device separately in external LSAs. If the incoming routes are continuous addresses, the autonomous border device can advertise only one aggregate route, reducing the scale of routing table greatly.

Unlike the **area range** command, the area range command aggregates inter-OSPF-area routes, while the summary-address command aggregates external routes of the OSPF routing domain. For the NSSA, the **summary-address** command is valid only on the NSSA ABR now, and aggregates only redistributed routes.

Configuration Examples

The following example generates an external aggregate route 100.100.0.0/16.

```
Orion_B54Q(config)# router ospf20
Orion_B54Q(config-router)# summary-address 100.100.0.0 255.255.0.0
```

```
Orion_B54Q(config-router)# redistribute static subnets
Orion_B54Q(config-router)# network200.2.2.0 0.0.0.255 area 1
Orion_B54Q(config-router)# network172.16.24.0 0.0.0.255area 0
Orion_B54Q(config-router)# arealnssa
```

Related Commands

Command	Description
area-range	Configures route convergence on the OSPF area border device.
redistribute	Redistributes routes of other routing processes.

Platform N/A

Description

2.69 timers lsa arrival

Use this command to configure the time delay for the same LSA received. Use the **no** form of this command to restore the default setting.

timers lsa arrival arrival-time

no timers lsa arrival

Parameter Description

Parameter	Description
<i>arrival-time</i>	Configures the time delay when receiving the same LSA. The range is from 0 to 600000 in the unit of milliseconds.

Defaults The default is 1000.

Command

Mode Routing process configuration mode

Usage Guide No action is done when the same LSA is received within the specified time.

Configuration Examples The following example configures the time delay for the same LSA as 2seconds.

```
Orion_B54Q(config)# routerospf1
Orion_B54Q(config-router)# timers arrival-time 2000
```

Related Commands

Command	Description
show ip ospf	Displays the OSPF information.

Platform N/A

Description

2.70 timers pacing lsa-group

Use this command to configure the LSA grouping and then refresh the whole groups as well as the update interval for the aged link state. Use the **no** form of this command to restore the default setting.

timers pacing lsa-group seconds

no timers pacing lsa-group

Parameter Description	Parameter	Description
	<i>seconds</i>	Parameter used for LSA pacing, checksum calculation, and aging interval. The range is from 10 to 1800 in the unit of seconds.

Defaults The default is 30.

Command

Mode Routing process configuration mode

Usage Guide Each LSA has its own update and aging time (LSA age). If you update and age LSAs separately, many CPU resources will be consumed. To effectively use CPU resources, you can update LSAs of a device in batches.

You can use this command to modify the value of seconds, whose default value is 240 seconds. This parameter needs not to be adjusted often. The optimal group pacing interval is inversely proportional to the number of LSAs that need to be calculated. For example, if you have approximately 10000 LSAs in the database, decreasing the pacing interval would be better. If the switch has a small database (40 to 100 LSAs), increasing the pacing interval to 10 to 20 minutes might be better.

Configuration Examples The following example configures the pacing time as 120 seconds.

```
Orion_B54Q(config)# deviceospf 20
Orion_B54Q (config-router)# timers paing lsa-group 120
```

Related Commands	Command	Description
	show ip ospf	Displays the OSPF information.

Platform N/A

Description

2.71 timers pacing lsa-transmit

Use this command to transmit the LSA grouping updating. Use the **no** form of this command to restore the default setting.

timers pacing lsa-transmit transmit-time transmit-count

no timers pacing lsa-transmit

Parameter Description	Parameter	Description
	<i>transmit-time</i>	Configures the interval of sending the LSA grouping. The range is from 10 to 1000.
	<i>transmit-count</i>	Configures the number of LS-UPD packets per group. The range is from 1 to 200.

Defaults The default configurations are as follows:
 Transmit-time: 40 milliseconds.
 Transmit-count: 10

Command Mode Routing process configuration mode

Usage Guide If there are a large number of LSAs and the load on the system is heavy, you can properly use the **transmit-time** and **transmit-count** to inhibit the flooding LS-UPD packet number in the network. If the CPU and network bandwidth loads are not too much, reduce **transimi-time** and increase **transimit-count** to quicken the environment convergence.

Configuration Examples The following example sets the interval of sending the LS-UPD packets as 50ms, the packets number as 20.

```
Orion_B54Q(config)# routerospf
Orion_B54Q(config-router)# timers pacing lsa-transmit 50 20
```

Related Commands	Command	Description
	show ip ospf	Displays the OSPF process information, including the router ID.

Platform Description N/A

2.72 timers spf

Use this command to configure the delay for SPF calculation after the OSPF receives the topology change as well as the interval between two SPF calculations. Use the **no** form of this command to restore the default setting.

timers spf spf-delay spf-holdtime
no timers spf

Parameter Description	Parameter	Description
	<i>spf-delay</i>	Defines the SPF calculation waiting period in seconds. The range is from 0 to 2147483647. After receiving the topology change, the

	OSPF routing process must wait for the specified period to start the SPF calculation.
<i>spf-holdtime</i>	Defines the interval between two SPF calculations in seconds. The range is from 0 to 2147483647. When the waiting time is up but the interval between two calculations is still elapsing, the SPF calculation cannot start.

Defaults For the NOS not supporting the timers throttle spf command, the default values are as follows:
 spf-delay: 5seconds;
 spf-holdtime: 10 seconds.
 For the NOS supporting the timers throttle spf command, by default, the timers spf command takes no effect. Spf-delay depends on the default configuration of the timers throttle spf command.

Command

Mode Routing process configuration mode

Usage Guide Smaller values of *spf-delay* and *spf-holdtime* mean that OSPF adapts to the topology change faster, and the network convergence period is shorter, but this will occupy more CPU of the router.

⚠ The configurations of the **timers spf command** and the timers throttle spf command may overwrite each other.

Configuration Examples The following example configures the delay and holdover period of the OSPF as 3 and 9 seconds respectively.

```
Orion_B54Q(config)# deviceospf20
Orion_B54Q(config-router)# timersspf 3 9
```

Related Commands

Command	Description
show ip ospf	Displays the configuration information of the ospf.
timers throttle spf	Configures the exponential back off delay for SPF calculation. The command is recommended to replace the timers spf command because it is more powerful.

Platform N/A

Description

2.73 timers throttle lsa all

Use this command to configure the exponential back off algorithm for the LSA. Use the **no** form of this command to restore the default setting.

timers throttle lsa all *delay-time hold-time max-wait-time*
no timers throttle lsa all

Parameter Description

Parameter	Description
<i>delay-time</i>	Configures the time delay of generating the LSA first. The range is from 1 to 600000.
<i>hold-time</i>	Configures the minimum interval of refreshing the LSA between the first time and second time. The range is from 1 to 600000.
<i>max-wait-time</i>	Configures the maximum interval of successive refreshing the LSA., which determines whether the LSA is refreshed successively. The range is from 1 to 600000

Defaults

The default configurations are as follows:

- Delay-time:** 0 millisecond,
- Hold-time:** 5000 milliseconds,
- Max-wait-time:** 5000 milliseconds.


Command

Mode

Routing process configuration mode

Usage Guide

If high convergence performance is required for the link change, the value of delay-time can be relatively small. if you expect to reduce the CPU consumption, increase appropriately several values.

 The value of hold-time cannot be smaller than that of delay-time, and the value of max-wait-time cannot be smaller than that of hold-time.

Configuration Examples

The following example configures the first delay as 10ms, hold-time as 1second and the longest delay as 5seconds.

```
Orion_B54Q(config)# routerospf1
Orion_B54Q(config-router)# timers throttle lsa all 10 1000 5000
```

Related Commands

Command	Description
show ip ospf	Displays the configuration information of the ospf

Platform

N/A

Description

2.74 timers throttle route

Use this command to configure the delay time of route calculation on receiving the ASBR summary LSA and the external summary LSA. Use the **no** form of this command to restore the default setting.

timers throttle route { inter-area ia-delay | ase ase-delay }

no timers throttle route { inter-area | ase }

Parameter Description	Parameter	Description
	inter-area	Calculates the inter area routes.
	<i>ia-delay</i>	Sets the delay time of the inter-area route calculation, in the range from 0 to 600,000 in the unit of milliseconds. On receiving the ASBR summary LSA, the router will not calculate the inter-area routes until the ia-delay time runs out.
	ase	Calculates the external routes.
	<i>ase-delay</i>	Defines the delay time of the external route calculation, in the range from 0 to 600,000 in the unit of milliseconds. On receiving the external summary LSA, the router will not calculate the external routes until the ase-delay time runs out.

Defaults The default values are as follows:
 ia-delay: 0,
 ase-delay: 0,

Command

Mode Routing process configuration mode

Usage Guide The default setting is recommended if the network needs to be fast converged. For the instable network where multiple inter-area and external routes exist, if you want to optimize the route calculation and save the CPU resources, increase the delay time.

Configuration Examples The following example sets the .delay time of the inter-area route calculation to one second.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config-router)# timers throttle route inter-area 1000
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

2.75 timers throttle spf

Use this command to configure the topology change information for OSPF, including the delay for SPF calculation as well as the interval between two SPF calculations in routing process configuration mode. Use the **no** form of this command to restore the default setting.

timers throttle spf spf-delay spf-holdtime spf-max-waittime
no timers throttle spf

Parameter Description	Parameter	Description
-----------------------	-----------	-------------

<i>spf-delay</i>	Defines the SPF calculation waiting period, in the unit of milliseconds, in the range from 1 to 600,000. After receiving the topology change, the OSPF routing process must wait for the specified period to start the SPF calculation.
<i>spf-holdtime</i>	Defines the interval between two SPF calculations in seconds in the range from 1 to 600,000.
<i>spf-max-waittime</i>	Defines the maximum interval between two SPF calculations, in milliseconds in the range from 1 to 60,000.

Defaults

The default configurations are as follows:

- spf-delay: 1000ms;
- spf-holdtime: 5000ms;
- spf-max-waittime: 10000ms.

Command

Mode

Routing process configuration mode

Usage Guide

The *spf-delay* parameter indicates the delay time of the topology change to the SPF calculation. The *spf-holdtime* parameter indicates the minimum interval between two SPF calculations. Then, the interval of the consecutive SPF calculations is at least twice as the last interval until it reaches to *spf-max-waittime*. If the interval between two SPF calculations has exceeded the required value, the SPF calculation will restart from *spf-holdtime*.
 Smaller *spf-delay* and *spf-holdtime* values can make the topology converge faster. A greater *spf-max-waittime* value can reduce the system resource consumption of SPF calculation. Those configurations can be flexibly adjusted according to the actual stability of the network topology. Compared with the *timers spf* command, this command is more flexible. It speeds up the SPF calculation convergence, and reduces the system resource consumption of SPF calculation due to the topology change. To this end, the *timers throttle spf* command is recommended.

- i The value of *spf-holdtime* cannot be smaller than the value of *spf-delay*, or the value of *spf-holdtime* will be set to be equal to the value of *spf-delay*;
 The value of *spf-max-waittime* cannot be smaller than the value of *spf-holdtime*, or the value of *spf-max-waittime* will be set to be equal to the value of *spf-holdtime* automatically;
 The configurations of the *timers spf* command and the *timers throttle spf* command may overwrite each other.
 If both the *timers spf* command and the *timers throttle spf* command are not configured, the default value of the *timers throttle spf* command is used.

Configuration Examples

The following example configures the delay and holdtime and the maximum time interval of the OSPF as 5ms, 1000ms and 90000ms respectively. If the topology changes consecutively, the SPF calculation intervals are: 5ms, 1second, 3 seconds, 7 seconds, 15 seconds, 31 seconds, 63 seconds, 89 seconds, 179 seconds, 179+90seconds...

```
Orion_B54Q(config)# routerospf20
Orion_B54Q(config-router)# timersspf 5 1000 90000
```

Related Commands

Command	Description
show ip ospf	Displays the configuration information of OSPF
timers spf	Configures the SPF calculation delay. This command is supported in versions earlier than NOS 10.4. It is recommended to replace the timers spf command with the timers throttle spf command.

Platform N/A
Description

2.76 two-way-maintain

Use this command to enable the OSPF two-way-maintain function. Use the **no** form of this command to disable this function.

two-way-maintain
no two-way-maintain

Parameter Description

Parameter	Description
N/A	N/A

Defaults This function is enabled by default.

Command

Mode Routing process configuration mode

Usage Guide

In the large-scale network, partial packets delay or dropped may exist due to much CPU and memory are occupied caused by lots of packet transmission. If the Hello packets are handled over dead-interval, the corresponding adjacency will be disconnected. In this case, you can enable the two-way-maintain function for the packets such as DD, LSU, LSR and LSAck packets from a neighbor in the network (except for the Hello packets), avoiding the neighbor invalidation caused by delayed or dropped Hello packets.

Configuration Examples

The following example disables the OSPF two-way-maintain function.

```
Orion_B54Q(config)# routerospf1
Orion_B54Q(config-router)# notwo-way-maintain
```

Related Commands

Command	Description
show ip ospf	Displays the configuration information of the OSPF

Platform N/A
Description

3 OSPFv3 Commands

3.1 area authentication

Use this command to configure OSPFv3 area authentication. Use the **no** form of this command to restore the default setting.

area *area-id* **authentication ipsec spi** *spi* [**md5** | **sha1**] [**0** | **7**] *key*
no area *area-id* **authentication**

Parameter Description	Parameter	Description
	<i>area-id</i>	Specifies an area ID. It can be an integer or the prefix of an IPv4 address.
	<i>spi</i>	Specifies a security parameter index, in the range from 256 to 4294967295.
	md5	Specifies a message digest 5 (MD5) authentication mode.
	sha1	Specifies a secure hash algorithm 1 (SHA1) authentication mode.
	0	Indicates that a key is displayed in a plain-text format.
	7	Indicates that a key is displayed in a cipher-text format.
	<i>key</i>	Specifies an authentication key.

Defaults Authentication is not performed by default.

Command Mode Routing process configuration mode

Usage Guide NOS supports three authentication modes:

- null authentication mode, which is configured when authentication is not needed
- MD5 authentication mode
- SHA1 authentication mode

If OSPFv3 area authentication is configured, the configuration takes effect on all interfaces (except for those of virtual links) in the area. Interface authentication configuration, however, takes precedence over area authentication configuration.

Configuration Examples The following example specifies MD5 authentication for area 1 where OSPFv3 routing processes reside, and sets the authentication password to aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa.

```
Orion_B54Q(config-router)# area 1 authentication ipsec spi 300 md5
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Related Commands	Command	Description
	ipv6 ospf authentication	Specifies interface authentication.

area virtual-link authentication	Specifies virtual link authentication.
---	--

Platform N/A

Description

3.2 area default-cost

Use this command to set the cost of the default route for the ABR in the stub or NSSA area. Use the **no** form of this command to restore the default setting.

area *area-id* **default-cost** *cost*

no area *area-id* **authentication**

Parameter Description	Parameter	Description
	<i>area-id</i>	Area ID of the stub or NSSA area. It can be an integer or an IPv4 prefix.
	<i>cost</i>	Cost of the default route of the stub or NSSA area in the range from 0 to 16777215.

Defaults The default cost is 1.

Command Mode Routing process configuration mode.

Usage Guide This command can only work in the ABR connected to the stub area.

Configuration Examples The following example sets the cost of the default route of stub area 50 to 100.

```
ipv6 router ospf 1
area 50 stub
area 50 default-cost 100
```

Related Commands	Command	Description
	area stub	Sets a stub area.

Platform N/A

Description

3.3 area encryption

Use this command to enable encryption authentication for an OSPFv3 area. Use the **no** form of this command to restore the default setting.

area *area-id* **encryption ipsec spi** *spi* **esp null** [**md5** | **sha1**] [**0** | **7**] *key*

no area *area-id* **encryption**

Parameter Description	Parameter	Description
	<i>area-id</i>	Specifies an area ID. It can be an integer or the prefix of an IPv4 address.
	<i>spi</i>	Specifies a security parameter index, in the range from 256 to 4294967295.
	null	Specifies the null encryption mode.
	md5	Specifies the MD5 authentication mode.
	sha1	Specifies the SHA1 authentication mode.
	0	Indicates that a key is displayed in the plain-text format.
	7	Indicates that a key is displayed in the cipher-text format.
	<i>Key</i>	Specifies an authentication key.

Defaults Encryption authentication is not performed by default.

Command Mode Routing process configuration mode

Usage Guide NOS supports the null encryption mode and two authentication modes: MD5 and SHA1. If encryption authentication is configured for an OSPFv3 area, the configuration takes effect on all interfaces (except for those of virtual links) in the area. Encryption authentication configuration on interfaces, however, takes precedence over that of the OSPFv3 area.

Configuration Examples The following example specifies null encryption and MD5 authentication for area 1 where OSPFv3 routing processes reside, and sets the authentication password to aaaaaaaaaaaaaaaaaaaaaaaaaaaaaa.

```
Orion_B54Q(config-router)# area 1 encryption ipsec spi 300 esp null md5
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Related Commands	Command	Description
	ipv6 ospf encryption	Specifies interface encryption authentication.
	area virtual-link encryption	Specifies virtual link encryption authentication.

Platform Description N/A

3.4 area-range

Use this command to set the range of the converged inter-area addresses. Use the **no** form of this command to restore the default setting.

area area-id range ipv6-prefix/prefix-length [advertise|not-advertise]
no area area-id range ipv6-prefix/prefix-length

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
<i>area-id</i>	ID of the area in which the addresses are converged. It can be an integer or an IPv4 prefix.
<i>ipv6-prefix/prefix-length</i>	Range of the converged addresses.
advertise	Advertises the range of converged addresses.
not-advertise	The range of the converged addresses is not advertised. By default, the function is enabled.

Defaults No converged inter-area address range is defined by default.

Command Mode Routing process configuration mode

Usage Guide This command applies only to ABR. Use this command to converge multiple routes of an area into one route and advertise it to other areas. This command applies only to ABR. Use this command to converge multiple routes of an area into one route and advertise it to other areas. The routing information combination only takes place on the area border. The specific routing information is seen on the intra-area routers, but only one converged route can be seen on the devices in other areas. By configuring the two options of advertise and not-advertise, you can decide whether to advertise the convergence range to enable blocking and filtering. By default, the range is advertised to the outside. The option cost can be used to set the metric value of convergence routing. A number of route convergence commands can be defined. In this way, the number of the routes in the OSPF AS is reduced. Particularly for a large network, the forwarding performance will be improved. When a number of routes are converged, and the containment relationship exists between items, the area range converged is determined by the longest match principle.

Configuration Examples The following example converges the routes in area 1.

```
ipv6 router ospf 1
area 1 range 2001:abcd:1:2::/64
```

Related Commands	Command	Description
	summary-prefix	Sets the range of the external routes to be converged.

Platform N/A
Description

3.5 area stub

Use this command to create a stub area or set its attributes. Use the **no** form of this command to restore the default setting.

area *area-id* **stub** [**no-summary**]
no area *area-id* **stub** [**no-summary**]

Parameter Description

Parameter	Description
<i>area-id</i>	ID of the stub area. It can be an integer or an IPv6 prefix.
no-summary	This option applies only to the ABR in the stub area, indicating that the ABR only advertises the type 3 LSA indicating the default route to the stub area, not other type 3 LSAs.

Defaults No stub area is defined by default.

Command

Mode Routing process configuration mode

Usage Guide If an area is at the end of an entire network, it can be designed as the stub area, in which all the routers must execute the area stub command. If the area is designed as the stub area, it cannot learn the AS external routing information (type 5 LSAs). In practical application, the external routing information takes a large proportion of the link state database, so the devices in the stub area can only learn very little routing information, thus reducing the system resources required for the running of the OSPFv3 protocol.

By default, a type 3 LSA advertisement indicating default routing on the ABR in the stub area is generated, then the devices in the stub area can get to the outside of the AS.

If a totally stub area needs to be configured, just select the keyword **no-summary** when executing the **area stub** command on the ABR.

Configuration Examples The following example enables the ABR in stub area 10 to advertise the default route to the stub area.

```
ipv6 router ospf 1
area 10 stub
area 10 stub no-summary
```

Related Commands

Command	Description
area default-cost	Sets the cost of the default route in the stub area.

Platform N/A
Description

3.6 area virtual-link

Use this command to create a virtual link or set its parameters. Use the **no** form of this command to restore the default setting.

area area-id virtual-link router-id [hello-interval seconds] [dead-interval seconds] [retransmit-interval seconds] [transmit-delay seconds] [instance instance-id] [authentication ipsec spi

```
spi [ md5 | sha1 ] [ 0 | 7 ] key ] [ encryption ipsec spi spi esp null [ md5 | sha1 ] [ 0 | 7 ] key ]
no area area-id virtual-link router-id [ hello-interval ] [ dead-interval ] [ retransmit-interval ] [
transmit-delay ] [ instance ] [ authentication ] [ encryption ]
```

Parameter
Description

Parameter	Description
<i>area-id</i>	ID of the area in which the virtual link is located. It can be an integer or an IPv6 prefix.
<i>Router-id</i>	Neighbor router ID of the virtual link.
hello-interval <i>seconds</i>	Sets the interval to send the hello message on the local virtual link interface in the range from 1 to 65535 in the unit of seconds.
dead-interval <i>seconds</i>	Interval for the local interface of the virtual link to wait before considering that the neighbor fails. It is in the range from 1 to 65535 in the unit of seconds.
retransmit-interval <i>seconds</i>	Interval for retransmitting LSA on the local interface of the virtual link . The range is from 1 to 65535 in the unit of seconds.
transmit-delay <i>seconds</i>	Delay on the local interface of the virtual link in sending LSA. The range is from 1 to 65535 in the unit of seconds.
instnace <i>instance-id</i>	Specifies the instance corresponding to the virtual link. No virtual link can be established between different instances. Range: 0.-255
authentication ipsec spi <i>spi</i> [md5 sha1] [0 7] <i>key</i>	Specifies OSPFv3 authentication. <ul style="list-style-type: none"> Authentication configuration on two neighboring devices must be consistent. The service password-encryption command enables a key to be displayed in the cipher-text format. <i>spi</i> specifies a security parameter index, in the range from 256 to 4294967295. md5 specifies the MD5 authentication mode. sha1 specifies the SHA1 authentication mode. 0 indicates that a key is displayed in the plain-text format. 7 indicates that a key is displayed in the cipher-text format. <i>key</i> specifies an authentication key.
encryption ipsec spi <i>spi</i> esp null [md5 sha1] [0 7] <i>key</i>	Specifies OSPFv3 encryption authentication. <ul style="list-style-type: none"> Authentication configuration on two neighboring devices must be consistent. The service password-encryption command enables a key to be displayed in the cipher-text format. <i>spi</i> specifies a security parameter index, in the range from 256 to 4294967295. null specifies the null encryption mode. md5 specifies the MD5 authentication mode. sha1 specifies the SHA1 authentication mode. 0 indicates that a key is displayed in the plain-text format.

	7 indicates that a key is displayed in the cipher-text format. <i>key</i> specifies an authentication key.
authentication ipsec spi <i>spi</i> [md5 sha1] [0 7] <i>key</i>	Specifies OSPFv3 authentication. <ul style="list-style-type: none"> Authentication configuration on two neighboring devices must be consistent. The service password-encryption command enables a key to be displayed in the cipher-text format. <i>spi</i> specifies a security parameter index, in the range from 256 to 4294967295. md5 specifies the MD5 authentication mode. sha1 specifies the SHA1 authentication mode. 0 indicates that a key is displayed in the plain-text format. 7 indicates that a key is displayed in the cipher-text format. <i>key</i> specifies an authentication key.

Defaults

No virtual link is defined by default
 hello-interval: 10 seconds; dead-interval: four times of the hello-interval; retransmit-interval: five seconds; transmit-interval: one second.
 Authentication and encryption are not performed by default.

Command Mode

Routing process configuration mode

Usage Guide

In the OSPFv3 AS, all the areas must be connected with the backbone area to ensure that they can learn the routes of the whole OSPFv3 AS. If an area cannot be directly connected with the backbone area, it can connect it through a virtual link.

- ⚠ The virtual link shall not be in the stub or NSSA area.
- ⚠ configuration, **dead-interval** and **instance** shall be configured consistently on both sides of the virtual link neighbors, otherwise neighboring relationship cannot be set up between the virtual neighbors.

Configuration Examples

The following example configures a virtual link.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# area 1 virtual-link 192.1.1.1
```

Related Commands

Command	Description
show ipv6 ospf	Displays the OSPFv3 routing process information.
show ipv6 ospf neighbor	Displays the OSPFv3 neighbor information.
show ipv6 ospf virtual-links	Displays the OSPFv3 virtual link information.

Platform Description

N/A

3.7 auto-cost

The metric of the OSPFv3 protocol is the interface-based bandwidth. Use this command to enable the bandwidth-based interface metric calculation or modify the reference bandwidth. Use the **no** form of this command to restore the default setting.

auto-cost reference-bandwidth *ref-bw*

no auto-cost reference-bandwidth

Parameter Description	Parameter	Description
	reference-bandwidth <i>ref-bw</i>	Reference bandwidth in the range from 1 to 4294967 Mbps.

Defaults The interface metric is calculated based on the reference bandwidth, which is 100Mbps.

Command Mode Routing process configuration mode

Usage Guide Use **no auto-cost reference-bandwidth** to restore it to the default reference bandwidth. You can use **ipv6 ospf cost** in the interface configuration mode to set the cost of the specified interface, and it takes precedence over the metric calculated based on the reference bandwidth.

Configuration Examples The following example changes the reference bandwidth to 10M.

```
ipv6 router ospf 1
auto-cost reference-bandwidth 5
```

Related Commands	Command	Description
	ipv6 ospf cost	Sets the cost of an interface.
	show ipv6 ospf	Displays the OSPFv3 routing process information.

Platform Description N/A

3.8 bdf all-interfaces

Use this command to enable the BDF on all OSPFv3 interfaces. Use this command to enable the BDF on all OSPFv3 interfaces in the routing configuration mode. Use the **no** form of this command to restore the default setting.

bdf all-interfaces

no bdf all-interfaces

Parameter Description	Parameter	Description
-----------------------	-----------	-------------

N/A	N/A
-----	-----

Defaults This function is disabled by default.

Command

Mode Routing process configuration mode.

Usage Guide The OSPFv3 protocol dynamically discovers the neighbors through the Hello packets. With the BFD function enabled, BFD sessions will be established for the neighbors that match the FULL rules and the status of the neighbors will be detected through the BFD mechanism. Once the BFD neighbor fails, the OSPFv3 will perform the network convergence immediately.

You can also use the interface configuration mode command **ipv6 ospf bfd [disable]** to enable or disable the BFD function on the specified interface, which takes precedence over the command **bfd all-interfaces** in the routing process configuration mode.

Configuration Examples N/A

Related Commands

Command	Description
ipv6 router ospf <i>process-id</i>	Enables the OSPFv3 routing process and enter into the routing process configuration mode.
ipv6 ospf bfd [disable]	Enables or disable the BFD on the specified OSPFv3 interfaces.

Platform Description N/A

3.9 clear ipv6 ospf process

Use this command to clear and restart the OSPF process.

clear ipv6 ospf { process | process-id }

Parameter Description

Parameter	Description
<i>process-id</i>	OSPF process ID, in the range from 1 to 65535

Defaults N/A

Command Mode

Privileged EXEC mode

Usage Guide In normal case, it is not necessary to use this command.

Use the parameter *process-id* to clear only one specific OSPFv3 instance. If no *process-id* is specified, all the OSPFv3 instances will be cleared.

Configuration The following example restarts the OSPF process.

n Examples

```
enable
clear ipv6 ospf process
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

3.10 default-information originate

Use this command to generate a default route to the OSPFv3 routing domain in the routing process mode. Use the **no** form of this command to restore the default setting.

default-information originate [**always**] [**metric** *metric*] [**metric-type** *type*] [**route-map** *map-name*]

no default-information originate [**always**] [**metric**] [**metric-type**] [**route-map** *map-name*]

Parameter Description

Parameter	Description
always	(Optional) It makes OSPFv3 generate the default route unconditionally, no matter whether the default route exists locally or not.
metric <i>metric</i>	(Optional) Initial metric value of the default route, in the range from 0 to 16777214
metric-type <i>type</i>	(Optional) Type of the default route. There are two type of OSPF external routes: type 1, different metrics seen on different routers; type 2, the same metric seen on different routers.
route-map <i>map-name</i>	Associated route-map name, no associated route-map by default

Defaults

No default route is created;
 The initial metric value is 1;
 The default route type is type 2.

Command Mode

Routing process configuration mode

Usage Guide

When the **redistribute** or default-information command is executed, the OSPFv3-enabled router automatically turns into the autonomous system border router (ASBR). But the ASBR cannot generate the default route automatically or advertise it to all the routers in the OSPFv3 routing domain. The ASBR generates default routes by default. It is required to configure with the routing process configuration command **default-information originate**.

If the **always** parameter is used, the OSPF routing process advertises an external default route to the neighbors, no matter whether the default route in the core routing table exists or not. However, the local router does not display the default route. To make sure whether the default route is generated,

execute **show ipv6 ospf database** to observe the OSPF link state database. The execution of the **show ipv6 route** command on the OSPF neighbor will display the default route.

The metric of the external default route can be defined only with the **default-information originate** command and cannot be set with the **default-metric** command.

There are two types of OSPFv3 external routes: type 1 external routes have changeable routing metrics, while type 2 external routes have constant routing metrics. For two parallel routes with the same route metric to the same destination network, type 1 takes precedence over type 2. As a result, the **show ipv6 route** command displays only the type 1 route.

This command generates a default route of Type-5 LSA, which will not be flooded to the NSSA area. To generate a default route in the NSSA area, use the **area nssa default-information-originate** command.

The routers in the stub area cannot generate external default routes.

Configuration Examples The following example generates a default route.

```
default-information originate always
```

Related Commands

Command	Description
redistribute	Redistribute routes.
show ipv6 ospf	Displays the OSPFv3 routing process information.
show ipv6 ospf database	Displays the OSPFv3 link state database information.

Platform N/A
Description

3.11 default-metric

Use this command to set the default metric for the routes to be redistributed. Use the **no** form of this command to restore the default setting

```
default-metric metric-value
no default-metric
```

Parameter Description

Parameter	Description
<i>metric-value</i>	Default metric for the routes to be redistributed. Its range is from 1 to 16777214.

Defaults The default is 20.

Command

Mode The default route type is type 2.

Usage Guide This command can be used together with **redistribute** to set the default metric for the routes to be

redistributed. But this command does not apply to two types of routes:

- The **default route generated** with default-information originate;
- The redistributed direct route, for which 20 is always the default metric value.

Configuration Examples The following example sets the default metric for the routes to be redistributed to 10.

```
default-metric 10
```

Related Commands

Command	Description
redistribute	Redistributes the routes.
show ipv6 ospf	Displays the OSPFv3 routing process information.

Platform N/A

Description

3.12 distance

Use this command to set the management distance corresponding to different types of OSPFv3 routes. Use the **no** form of this command to restore the default setting.

distance { *distance* | **ospf** { **intra-area** *distance* | **inter-area** *distance* | **external** *distance* } }

no distance [**ospf**]

Parameter Description

Parameter	Description
<i>distance</i>	Sets the management distance of the route, in the range from 1 to 255.
intra-area <i>distance</i>	Sets the management distance of the intra-area route, in the range from 1 to 255.
inter-area <i>distance</i>	Sets the management distance of the inter-area route, in the range from 1 to 255.
external <i>distance</i>	Sets the management distance of the external route, in the range from 1 to 255.

Defaults

The default value is 110.
 Management distance of the intra-area route :110,
 Management distance of the inter-area route :110
 Management distance of the external-area route: 110.

Command Mode

Routing process configuration mode.

Usage Guide

This command is used to specify different management distances for different types of OSPFv3 routes. The management distance of the route is used for the comparison of routing priority, the

smaller the management distance is, the higher the routing priority.

▲ The priority of the route generated by different OSPFv3 processes must be compared using the management distance.

▲ Setting the management distance as 255 indicates the routing entry is unreliable and will not be used for the packet forwarding.

Configuration Examples the following example sets the OSPFv3 external route management distance to 160.

```
Orion_B54Q(config)# ipv6 router ospf 20
Orion_B54Q(config-router)# distance ospf external 160
```

Related Commands

Command	Description
ipv6 router ospf	Enables the OSPFv3 routing process .

Platform N/A
Description

3.13 distribute-list in

Use this command to filter routes that are computed based on Link State Advertisement (LSA). Use the **no** form of this command to restore the default setting.

distribute-list { *name* | **prefix-list** *prefix-list-name* } **in** [*interface-type interface-number*]

no distribute-list { *name* | **prefix-list** *prefix-list-name* } **in** [*interface-type interface-number*]

Parameter Description

Parameter	Description
<i>name</i>	Specifies an ACL filtering rule.
prefix-list <i>prefix-list-name</i>	Specifies a prefix list filtering rule.
<i>interface-type interface-number</i>	Specifies an interface on which LSA-based routes are filtered.

Defaults Routes are not filtered by default.

Command Mode Routing process configuration mode

Usage Guide Filter the routes computed based on LSA. Only the routes meeting filtering conditions can be forwarded. Route filtering does not affect the link state database and the routing tables of the neighbors. The ACL and prefix list filtering rules cannot be set at the same time. You can set only the ACL filtering rule or the prefix list filtering rule for a specific interface. The routing filtering rules affect only forwarding of local routes but not route computation based on LSA. When route filtering is configured on an ABR, LSA can still compute routes and generate and send inter-area LSAs with prefixes to other areas. This will cause blackhole routes. To prevent the generation of blackhole routes, you can run the **area range** command with the **not-advertise**

keyword.

Configuration Examples The following example filters routes that are computed based on Link State Advertisement (LSA).

```
Orion_B54Q(config)# ipv6 prefix-list aaa seq 10 permit 2001::/64
Orion_B54Q(config)# ipv6 router ospf 25
Orion_B54Q(config-router)# redistribute rip metric 100
Orion_B54Q(config-router)# distribute-list prefix-list aaa in ethernet 0/1
```

Related Commands

Command	Description
area range	Configures route aggregation in an area.

Platform N/A

Description

3.14 distribute-list out

Use this command to filter routes that are re-distributed. This command has the similar function as the **redistribute** command. Use the **no** form of this command to restore the default setting.

distribute-list { *name* | **prefix-list** *prefix-list-name* } **out** [**bgp** | **connected** | **isis** [*area-tag*]] | **ospf** *process-id* | **rip** | **static**]

no distribute-list { *name* | **prefix-list** *prefix-list-name* } **out** [**bgp** | **connected** | **isis** [*area-tag*]] | **ospf** *process-id* | **rip** | **static**]

Parameter Description

Parameter	Description
<i>name</i>	Specifies the ACL filtering rule.
prefix-list <i>prefix-list-name</i>	Specifies the prefix list filtering rule.
bgp connected isis [<i>area-tag</i>] ospf <i>process-id</i> rip static	Specifies the source from which the routes are filtered.

Defaults Routes are not filtered by default.

Command Mode Routing process configuration mode

Usage Guide The **distribute-list out** command has the similar function as the **redistribute route-map** command. It can be used to filter the routes that are re-distributed based on other protocols into an OSPFv3 area. It does not directly re-distribute routes but works with the **redistribute** command to re-distribute routes. The ACL and prefix list filtering rules cannot be configured at the same time. You can set only the ACL filtering rule or the prefix list filtering rule to filter the routes from a specific source.

Configuration Examples The following example filters static routes that are re-distributed.

```
Orion_B54Q(config)# ipv6 router ospf 1
```

```
Orion_B54Q(config-router)# redistribute static subnets
Orion_B54Q(config-router)# distribute-list prefix-list jjj out static
```

Related Commands

Command	Description
redistribute	Re-distributes routes that are carried by other routing processes.

Platform N/A
Description

3.15 enable mib-binding

Use this command to bind MIB to a specific OSPFv3 process. Use the **no** form of this command to restore the default setting.

- enable mib-binding**
- no enable mib-binding**

Parameter Description

Parameter	Description
N/A	N/A

Defaults MIB is bound to an OSPFv3 process with the smallest process number by default.

Command Mode Routing process configuration mode

Usage Guide OSFPv3 MIB has no configuration information about OSFPv3 processes. You can operate only one OSFPv3 process through SNMP. OSFPv3 MIB is bound to the OSFPv3 process with the smallest process number by default. Users' operations take effect on this process.
 To operate a specific OSFPv3 process through SNMP, you can bind OSFPv3 MIB to the process.

Configuration Examples The following example enables users to operate the OSPFv3 process with the process number of 100 through SNMP.

```
Orion_B54Q(config)# ipv6 router ospf 100
Orion_B54Q(config-router)# enable mib-binding
```

Related Commands

Command	Description
show ipv6 ospf	Displays global OSPFv3 configuration information.
enable traps	Enables the OSPFv3 trap function.

Platform N/A
Description

3.16 enable traps

OSPFv3 processes support eight types of trap information, which are classified into two categories. Use this command to send specific trap information. Use the **no** form of this command to restore the default setting.

```
enable traps [ error [ IfConfigError | IfRxBadPacket | VirtIfConfigError | VirtIfRxBadPacket ] |
state-change [ IfStateChange | NbrStateChange | NssaTranslatorStatusChange |
VirtIfStateChange | VirtNbrStateChange ] ]
no enable traps [ error [ IfConfigError | IfRxBadPacket | VirtIfConfigError | VirtIfRxBadPacket ] |
state-change [ IfStateChange | NbrStateChange | NssaTranslatorStatusChange |
VirtIfStateChange | VirtNbrStateChange ] ]
```

Parameter
Description

Parameter	Description
Error	<p>Configures all error-related trap types. This keyword can also specify the following types of error traps:</p> <ul style="list-style-type: none"> IfConfigError Specifies an interface parameter error; IfRxBadPacket Specifies incorrect packets received by an interface; VirtIfConfigError Specifies a parameter error on a virtual interface; VirtIfRxBadPacket Specifies incorrect packets received by a virtual interface.
state-change	<p>Configures all traps related to state change. This keyword can also specify the following traps related to state change:</p> <ul style="list-style-type: none"> IfStateChange Specifies state change of an interface; NbrStateChange Specifies state change of a neighbor; NssaTranslatorStatusChange Specifies status change of the NSSA translator. VirtIfStateChange Specifies state change of a virtual interface; VirtNbrStateChange Specifies state change of a virtual neighbor.
md5	Specifies a message digest 5 (MD5) authentication mode.
sha1	Specifies a secure hash algorithm 1 (SHA1) authentication mode.
0	Indicates that a key is displayed in a plain-text format.
7	Indicates that a key is displayed in a cipher-text format.
<i>key</i>	Specifies an authentication key.

Defaults All traps are disabled by default.

Command Mode Routing process configuration mode

Usage Guide Before configuring this command, you must run the **snmp-server enable traps ospf** command; otherwise, OSPFv3 trap information cannot be sent correctly. This is because the function of this command is restricted by the **snmp-server** command.
 You can synchronously enable the trap function of different processes even if MIB is not bound to these processes.

Configuration Examples The following example enables all traps of OSPFv3 process 100.

```
Orion_B54Q(config)#ipv6 router ospf 100
Orion_B54Q(config-router)# enable traps
```

Related Commands

Command	Description
show ipv6 ospf	Displays global OSPFv3 configuration information.
enable mib-binding	Binds MIB to an OSPFv3 process.
snmp-server enable traps ospf	Enables OSPFv3 to send trap information.

Platform N/A

Description

3.17 graceful-restart

Use this command to enable the OSPFv3 graceful restart (GR) function and to set the GR period. Use the **no** form of this command to restore the default setting.

graceful-restart [**grace-period** *grace-period* | **inconsistent-lsa-checking**]
no graceful-restart [*graceful-period*]

Parameter Description

Parameter	Description
grace-period <i>grace-period</i>	Configures the GR period. The GR period is the longest interval that lasts from the moment when OSPFv3 fails to the moment when OSPFv3 gracefully restarts. The GR period is in the range from 1 to 1800 in the unit of seconds. The default is 120.
inconsistent-lsa-checking	Configures the topology change detection. Once the topology change is detected, the device will exit GR and finish the convergence, This function is enabled by default after GR is enabled.

Defaults This function is enabled by default.

Command

Mode Routing process configuration mode

Usage Guide

GR is configured based on the OSPFv3 instance. Different instances could be configured with different parameters.

Use this command to configure the GR period. The GR period is the longest interval that lasts from the moment when OSPFv3 fails to the moment that OSPFv3 gracefully restarts. In this period, the device will perform link reconstruction to restore OSPFv3. When the GR period expires, OSPFv3 exits GR and finishes regular operation.

To enable the GR function and set the GR period to the 120 seconds, use the **graceful-restart** command. To modify the GR period, use the **graceful-restart grace-period** command. Topology stability is indispensable for uninterrupted forwarding. If topology changes, OSPFv3 finishes convergence instead of continuing GR to avoid long time interruption

- 1) Disabling the topology change detection: If the topology cannot converge in time in the hot backup process, the long term forwarding interruption may occur.
- 2) Enabling the topology change detection: Forwarding interruption may occur but the interruption time is much shorter than the time it takes to disable topology detection.

It is not recommended to disable the topology change detection. In some scenario where long term forwarding interruption does not occur, disabling the topology change detection minimizes the forwarding interruption time.

The GR function is unavailable when the Fast Hello function is enabled.

Configuration Examples

The following example enables GR for OSPFv3 instance 1 and sets the GR period to 60 seconds.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# graceful-restart
Orion_B54Q(config-router)# graceful-restart grace-period 60
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

3.18 graceful-restart helper

Use this command to enable the OSPFv3 graceful restart helper function. Use the **no** form of this command to disable this function.

graceful-restart helper disable
no graceful-restart helper disable

Use this command configure the topology change detection method of OSPFv3 GR helper. Use the **no** form of this command to cancel the configuration.

graceful-restart helper { strict-lsa-checking | internal-lsa-checking}
no graceful-restart helper {strict-lsa-checking | internal-lsa-checking}

Parameter Description	Parameter	Description
	disable	Disables the device to assist other devices in performing GR.
	strict-lsa-checking	Checks the change of the LSA of types 1-5 and 7 to judge whether the network topology changes. If the topology changes, the GR helper function will be disabled.
	internal-lsa-checking	Checks the change of the LSA of types 1–3 to judge whether the network topology changes. If the topology changes, the GR helper function will be disabled.

Defaults The GR helper is enabled by default.
 The device where the GR helper is enabled does not check the LSA change by default.

Command Mode Routing process configuration mode

Usage Guide Use this command to enable the GR helper function. When one neighbor device performs graceful restart, the Grace-LSA is advertised to all neighbors. If the device enabled with the GR helper receives the Grace-LSA, it will become the GR Helper to help the neighbors perform GR. The **disable** option means that it is not allowed to perform the GR helper function for any device in GR. The GR helper does not perform the network change detection by default. The convergence is not performed again until the GR is implemented even if the network changes. Use the **strict-lsa-checking** or **internal-lsa-checking** command to enable the device to detect the change of network topology during the GR. The former checks any LSA (types 1-5,7) that stands for the network information, the latter checks the LSA that stands for the AS inner-area route. In the large scale network, it is not recommended to enable the LSA check option because the partial network changes trigger the ending of the GR, decreasing the convergence speed of the entire network.

Configuration Examples The following example disables the GF helper function of the OSPFv3 instance 1 and modifies the topology change detection policy.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# graceful-restart helper disable
Orion_B54Q(config-router)# no graceful-restart helper disable
Orion_B54Q(config-router)# graceful-restart helper strict-lsa-checking
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

3.19 ipv6 ospf area

Use this command to enable the interface to participate in the OSPFv3 routing process. Use the **no**

form of this command to restore the default setting.

ipv6 ospf *process-id* **area** *area-id* [**instance** *instance-id*]

no ipv6 ospf *process-id* **area** [**instance** *instance-id*]

Parameter Description

Parameter	Description
<i>process-id</i>	OSPF process ID.
area <i>area-id</i>	OSPFv3 area in which the interface participates. It can be an integer or an IPv4 prefix.
instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface.

Defaults This function is disabled by default.

Command Mode Interface configuration mode.

Usage Guide You can use this command to enable the OSPFv3 on an interface, and then configure the OSPFv3 process with **ipv6 router ospf**. it will be automatically started after this command is used., it will be automatically started after this command is used.

Use **no ipv6 ospf area** to disable the specified interface to participate in the OSPFv3 routing process.

Use **no ipv6 router ospf** to disable all the interfaces to participate in the OSPFv3 routing process.

The neighbor relationship can only be established between the routers with the same instance ID.

After this command is configured, all the prefix information on the interface will be used in the operation of the OSPFv3.

Configuration Examples The following example starts the OSPFv3 process on int fastethernet 0/0 for the specified area of the specified instance.

```
int fastethernet 0/0
ipv6 ospf 1 area 2 instance 2
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
passive-interface	Setsthe a passive interface.
show ipv6 ospf interface	Displays the OSPFv3 interface information.

Platform Description N/A

3.20 ipv6 ospf authentication

Use this command to configure OSPFv3 interface authentication. Use the **no** form of this command to restore the default setting.

ipv6 ospf authentication [**null** | **ipsec spi** *spi* [**md5** | **sha1**] [**0** | **7**] *key*]

no ipv6 ospf authentication

Parameter Description	Parameter	Description
	null	Indicates that authentication is not performed.
	<i>spi</i>	Specifies a security parameter index, in the range from 256 to 4294967295.
	md5	Specifies the MD5 authentication mode.
	sha1	Specifies the SHA1 authentication mode.
	0	Indicates that a key is displayed in the plain-text format.
	7	Indicates that a key is displayed in the cipher-text format.
	<i>key</i>	Specifies an authentication key.

Defaults Authentication is not performed by default.

Command Mode Interface configuration mode

Usage Guide NOS supports three authentication modes:

- null authentication mode, which is configured when authentication is not needed
- MD5 authentication mode
- SHA1 authentication mode

❗ OSPFv3 authentication parameters configured on interconnected interfaces must be consistent.

Configuration Examples The following example specifies MD5 authentication in OSPFv3 interface configuration mode and sets the authentication password to aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa.

```
Orion_B54Q(config-if)# ipv6 ospf authentication ipsec spi 300 md5
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Related Commands	Command	Description
	ipv6 ospf authentication	Specifies interface authentication.
	area virtual-link authentication	Specifies virtual link authentication.

Platform Description N/A

3.21 ipv6 ospf bfd

Use this command to enable or disable the BFD on the specified OSPFv3-enabled interface. Use the **no** form of this command to restore the default setting.

ipv6 ospf bfd [dsable] [instance *instance-id*]

no ipv6 ospf bfd [instance *instance-id*]

Parameter Description	Parameter	Description
	disable	Disables the BFD function on the specified OSPF interface.
	instance <i>instance-id</i>	Configures the specified OSPFv3 instance on the interface, in the range from 0 to 255.

Defaults No configuration is made by default. The BFD configuration in the OSPFv3 process configuration mode will apply.

Command

Mode Interface configuration mode.

Usage Guide The command `ipv6 ospf bfd` in the interface configuration mode takes precedence over the **bfd all-interfaces** command in the routing process configuration mode. You can use this command to enable the BFD on the specified interface according to the actual environment, also can use the command **bfd all-interfaces** in the OSPFv3 process configuration mode to enable the BFD function on all OSPFv3 interfaces and use the command `ip v6 ospf bfd disable` to disable the BFD on the specified interface.

Configuration Examples N/A

Related Commands	Command	Description
	ipv6 router ospf <i>process-id</i>	Starts the OSPFv3 routing process and enter into the routing process configuration mode.
	bfd all-interfaces	Enables the BFD on all OSPFv3 interfaces.

Platform Description N/A

3.22 ipv6 ospf cost

Use this command to set the cost of the interface. Use the **no** form of this command to restore the default setting

ipv6 ospf cost *cost* [instance *instance-id*]
no ipv6 ospf cost [instance *instance-id*]

Parameter Description	Parameter	Description
	<i>Cost</i>	Cost of interface, in the range from 0 to 65535.
	instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface, in the range from 0 to 255.

Defaults The default interface cost is the reference bandwidth/Bandwidth (100Mbps by default).

Command Mode Interface configuration mode.

Usage Guide By default, the cost of the OSPFv3 interface is 100Mbps/Bandwidth, in which the Bandwidth is the bandwidth of the interface and configured with the command **bandwidth** in the interface configuration mode.

The default costs of OSPFv3 interfaces for several typical lines are:

- 64K serial line: 1562;
- E1 line: 48
- 10M Ethernet: 10
- 100M Ethernet: 1

The OSPFv3 cost configured with the command **ipv6 ospf cost** will overwrite the default configuration.

Configuration Examples The following example sets the cost of the interface to 1:

```
ipv6 ospf cost 1
```

Related Commands

Command	Description
show ipv6 ospf interface	Displays the OSPFv3 interface information.
ipv6 ospf area	Sets the interface to participate in the OSPFv3 routing process.

Platform N/A

Description

3.23 ipv6 ospf dead-interval

Use this command to set a dead interval of neighbors on an interface. If no hello packet is received from a neighbor within the interval, the neighboring relationship is considered to fail. Use the **no** form of this command to restore the default setting

ipv6 ospf dead-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf dead-interval [**instance** *instance-id*]

Parameter Description

Parameter	Description
<i>seconds</i>	Dead interval of neighbors. Its range is from 1 to 65535 in the unit of seconds.
instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface, in the range from 0 to 255.

Defaults If the fast hello function is not enabled, the dead interval of neighbors is four times longer than the

hello interval.

▲ If the hello interval is changed, the dead interval of neighbors varies automatically.

Command Mode Interface configuration mode

Usage Guide The dead interval of neighbors must be longer than the hello interval.

Configuration Examples The following example sets the dead interval of neighbors to 60 seconds on an interface.

```
ipv6 ospf dead-interval 60
```

Related Commands

Command	Description
ipv6 ospf hello-interval	Sets the interval for sending the Hello message on an interface.
show ipv6 ospf interface	Displays the OSPFv3 interface information.
ipv6 ospf area	Sets the interface to participate in the OSPFv3 routing process

Platform N/A

Description

3.24 ipv6 ospf encryption

Use this command to enable OSPFv3 encryption authentication on an interface. Use the **no** form of this command to restore the default setting.

ipv6 ospf encryption [null | ipsec spi spi esp null [md5 | sha1] [0 | 7] key]

no ipv6 ospf encryption

Parameter Description

Parameter	Description
null	Indicates that encryption authentication is not performed.
<i>spi</i>	Specifies a security parameter index, in the range from 256 to 4294967295.
null	Specifies the null encryption mode.
md5	Specifies the MD5 authentication mode.
sha1	Specifies the SHA1 authentication mode.
0	Indicates that a key is displayed in the plain-text format.
7	Indicates that a key is displayed in the cipher-text format.
<i>key</i>	Specifies an authentication key.

Defaults Encryption authentication is not performed by default.

Command Mode Interface configuration mode

Usage Guide NOS supports the null encryption mode and two authentication modes: MD5 and SHA1.

Info OSPFv3 encryption authentication parameters configured on interconnected interfaces must be consistent.

Configuration Examples The following example specifies null encryption and MD5 authentication in OSPFv3 interface configuration mode and sets the authentication password to aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa.

```
Orion_B54Q(config-if)# ipv6 ospf encryption ipsec spi 300 esp null md5
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa
```

Command	Description
area encryption	Specifies area encryption authentication.
area virtual-link encryption	Specifies virtual link encryption authentication.

Platform Description N/A

3.25 ipv6 ospf hello-interval

Use this command to set the interval for the interface to send the Hello message. Use the **no** form of this command to restore the default setting

ipv6 ospf hello-interval seconds [instance instance-id]
no ipv6 ospf hello-interval [instance instance-id]

Parameter Description	Parameter	Description
	<i>seconds</i>	Interval for sending the Hello message. Its range is from 1 to 65535 in the unit of seconds.
	instance instance-id	Configures the specific OSPFv3 instance on the interface.

Defaults The broadcast network and point-to-point network :10 seconds. The point-to-multipoint network and NBMA network :30 seconds.

Command Mode Interface configuration mode.

Usage Guide The same hello sending intervals must be set for the neighbors, otherwise the normal adjacency cannot be established.

Info The dead-interval minimal hello-multiplier and hello-interval parameters for Fast Hello cannot be configured simultaneously.

Configuration Examples The following example sets the interval for the interface to send the Hello message to 20 seconds.

```
ipv6 ospf hello-interval 20
```

Related Commands

Command	Description
ipv6 ospf dead-interval	Sets the interval for the interface to consider that the neighbor fails.
show ipv6 ospf interface	Displays the OSPFv3 interface information.
ipv6 ospf area	Sets the interface to participate in the OSPFv3 routing process.

Platform N/A

Description

3.26 ipv6 ospf mtu-ignore

Use this command to ignore the MTU check when an interface receives the database description message. Use the **no** form of this command to restore the default setting.

```
ipv6 ospf mtu-ignore [ instance instance-id ]
```

```
no ipv6 ospf mtu-ignore [ instance instance-id ]
```

Parameter Description

Parameter	Description
instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface, in the range from 0 to 255.

Defaults The MTU check is enabled by default.

Command

Mode Interface configuration mode.

Usage Guide After receiving the database description message, the OSPFv3 device will check whether the MTU of neighbor interface is the same as its own MTU. If the received database description message indicates an MTU greater than its own interface's MTU, the neighbor relationship cannot be established. This can be fixed by disabling the MTU check.

Configuration Examples The following example disables the MTU check function on the ethernet 1/0.

```
Orion_B54Q(config)# interface ethernet 1/0
```

```
Orion_B54Q(config-if)# ipv6 ospf mtu-ignore
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
ipv6 mtu	Sets the value of IPv6 MTU of the interface.

Platform N/A
Description

3.27 ipv6 ospf neighbor

Use this command to configure the OSPFv3 neighbor manually. Use the **no** form of this command to restore the default setting.

ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** <0-2147483647> | **priority** <0-255>]] [**instance** *instance-id*]

no ipv6 ospf neighbor *ipv6-address* [[**cost** <1-65535>] [**poll-interval** < 0-2147483647 > | **priority** < 0-255 >]] [**instance** *instance-id*]

Parameter Description	Parameter	Description
	cost <i>cost</i>	(Optional) Configures the cost to each neighbor in point-to-multipoint network. It is not defined by default, where the cost configured on the interface will be used. It ranges from 1 to 65535. Only the networks of the point-to-multipoint type support this option.
	poll-interval <i>seconds</i>	(Optional) Interval for polling the neighbors (in seconds), which ranges from 1 to 2147483647. Only the networks of the non-broadcast (NBMA) type support this option.
	priority <i>priority</i>	(Optional) Configures the priority value of non-broadcast network neighbors, which ranges from 0 to 255. Only the non-broadcast (NBMA) type network supports this option.
	instance <i>instance-id</i>	(Optional) Configures the specific OSPFv3 instance on the interface, which ranges from 0 to 255.

Defaults No neighbor is defined;
 Neighbor polling interval: 120 seconds;
 Priority value of non-broadcast network neighbor: 0.

Command Mode Interface configuration mode.

Usage Guide You can set relevant parameters for the neighbors depending on the actual network type.

Configuration Examples The following example shows how to configure the OSPFv3 neighbor as follows: IPv6 address: 2001:DB8:4::1, priority value: 1, polling interval: 150 seconds.

```
Orion_B54Q(config)# interface fastEthernet 0/1
Orion_B54Q(config-if)# ipv6 ospf neighbor 2001:DB8:4::1 priority 1 poll-interval 150
```

Related Commands	Command	Description
------------------	---------	-------------

ipv6 ospf priority	Sets the priority value of an interface.
ipv6 ospf network	Sets the network type of an interface.

Platform N/A
Description

3.28 ipv6 ospf network

Use this command to set the network type of the interface. Use the **no** form of this command to restore the default setting.

ipv6 ospf network { **broadcast** | **non-broadcast** | **point-to-point** | **point-to-multipoint** [**non-broadcast**] } [**instance** *instance-id*]

no ipv6 ospf network [**broadcast** | **non-broadcast** | **point-to-point** | **point-to-multipoint** [**non-broadcast**]] [**instance** *instance-id*]

Parameter Description	Parameter	Description
	broadcast	Specifies the broadcast network type.
	non-broadcast	Specifies the non-broadcast network type.
	point-to-point	Specifies the point-to-point network type.
	point-to-multipoint	Specifies the point-to-multipoint network type.
	point-to-multipoint non-broadcast	Specifies the point-to-multipoint non-broadcast network type.
	instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface with the valid id range from 0 to 255.

Defaults Point-to-point network type: PPP, SLIP, frame relay point-to-point sub-interface and X.25 point-to-point sub-interface encapsulation.
 NBMA network type: frame relay(except for the point-to-point sub-interface) and X.25 encapsulation (except for the point-to-point sub-interface)
 Broadcast network type: Ethernet encapsulation.
 The point-to-multipoint network type is not the default type.

Command Mode Interface configuration mode.

Usage Guide You can set the network type of the interface according to the actual link type applied and the topology.

Configuration Examples The following example sets the network type of the interface that participates in the OSPFv3 to point-to-point.

```
ipv6 ospf network point-to-point
```

Related Commands	Command	Description
------------------	---------	-------------

ipv6 ospf priority	Sets the interface priority.
show ipv6 ospf interface	Displays the OSPFv3 interface information.
ipv6 ospf area	Sets the interface to participate in the OSPFv3 routing process.

Platform N/A

Description

3.29 ipv6 ospf priority

Use this command to set the interface priority. Use the **no** form of this command to restore the default setting.

ipv6 ospf priority *number-value* [**instance** *instance-id*]

no ipv6 ospf priority [**instance** *instance-id*]

Parameter Description	Parameter	Description
	<i>number-value</i>	The priority of the interface. Its range is from 0 to 255.
	instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface. Its range is from 0 to 255.

Defaults The default priority is 1.

Command Mode Interface configuration mode.

Usage Guide In the broadcast network type, it is necessary to elect the DR/BDR. In electing the DR/BDR, the device of a higher priority is preferred. If several devices are of the same priority, the one with the largest router-ID is preferred.
The device with the priority level of 0 does not participate in the election of DR/BDR.

Configuration Examples The following example disables the interface from being elected as the DR/BDR.

```
ipv6 ospf priority 0
```

Related Commands	Command	Description
	ipv6 ospf network	Sets the network type of an interface.
	router-id	Sets the ID of a router.
	show ipv6 ospf interface	Displays the OSPFv3 interface information.
	instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface.

Platform N/A

Description

3.30 ipv6 ospf retransmit-interval

Use this command to set the interval for the interface to retransmit the LSA. Use the **no** form of this command to restore the default setting.

ipv6 ospf retransmit-interval *seconds* [**instance** *instance-id*]

no ipv6 ospf retransmit-interval [**instance** *instance-id*]

Parameter Description

Parameter	Description
<i>seconds</i>	Interval for retransmitting the LSA. Its range is from 1 to 65535 in the unit of seconds.
instance <i>instance-id</i>	Configures the specific OSPFv3 instance on the interface.

Defaults The default is five seconds.

Command

Mode Interface configuration mode.

Usage Guide

To ensure the reliability of the routing information transmission, the LSA sent to the neighbor shall be acknowledged by the neighbor. You can use this command to set the interval for the acknowledgement by the neighbor. If no acknowledgement is received within the specified period, the LSA information will be retransmitted.

Configuration Examples

The following example sets the interval for retransmitting the LSA to 10 seconds.

```
ipv6 ospf retransmit-interval 10
```

Related Commands

Command	Description
show ipv6 ospf interface	Displays the OSPFv3 interface information.
ipv6 ospf area	Sets the interface to participate in the OSPFv3 routing process.

Platform N/A

Description

3.31 ipv6 ospf transmit-delay

Use this command to set the delay on the interface in sending the LSA. Use the **no** form of this command to restore the default setting.

ipv6 ospf transmit-delay *seconds* [**instance** *instance-id*]

no ipv6 ospf transmit-delay [**instance** *instance-id*]

Parameter Description

Parameter	Description
<i>seconds</i>	The delay in sending LSA.

	Its range is from 1 to 65535 in the unit of seconds.
instance <i>instance-id</i>	Configures the ID of a specific OSPFv3 instance on the interface, in the range from 0 to 255.

Defaults The default is one.

Command Interface configuration mode.

Mode

Usage Guide Use this command to set the delay on the interface in transmitting the LSA.

Configuration Examples The following example sets the delay on the interface in transmitting the LSA.

```
ipv6 ospf transmit-delay 2
```

Related Commands

Command	Description
show ipv6 ospf interface	Displays the OSPFv3 interface information.

Platform N/A

Description

3.32 ipv6 router ospf

Use this command to start the OSPFv3 routing process. Use the **no** form of this command to restore the default setting.

ipv6 router ospf

ipv6 router ospf *process-id* [**vrf** *vrf-name*]

no ipv6 router ospf *process-id*

Parameter Description

Parameter	Description
<i>process-id</i>	OSPFv3 process ID number. Without the process number configured, it indicates that process 1 is started.
<i>vrf-name</i>	Specifies the VRF that OSPFv3 process belongs to.

Defaults No OSPFv3 routing process is started.

Command

Mode Global configuration mode.

Usage Guide After the OSPFv3 process is started, the routing process configuration mode is entered. At present, our products support up to 32 OSPFv3 processes.

Configuration Examples The following example starts OSPFv3 process in the specified VRF VPN1.

```
Orion_B54Q(config)# ipv6 router ospf 1 vrf vpn_1
```

Related

Command	Description
---------	-------------

Commands	
ipv6 ospf area	Configures an interface to participate in the OSPFv3 routing process.
show ipv6 ospf	Displays the OSPFv3 routing process information.

Platform N/A

Description

3.33 ipv6 router ospf max-concurrent-dd

Use this command to set the maximum concurrent interacting neighbors allowed in all OSPFv3 routing processes. Use the **no** form of this command to restore the default setting.

ipv6 router ospf max-concurrent-dd *number*

no ipv6 router ospf max-concurrent-dd

Parameter Description	Parameter	Description
	<i>number</i>	Maximum concurrent interacting neighbors, in the range from 1 to 65535.

Defaults The default is 5.

Command Mode Global configuration mode

Usage Guide When a router is exchanging data with multiple neighbors at the same time which affects its performance, by configuring this command, the maximum concurrent interacting neighbors allowed in all OSPFv3 routing processes can be restricted.

Configuration Examples The following example sets the maximum concurrent interacting neighbors allowed in all OSPFv3 routing processes to 4. The result is that in the interaction between a large number of neighbors, interactions with up to 4 neighbors are allowed to be initiated on this device concurrently, and interactions initiated by up to 4 neighbors are allowed to be received concurrently. That is, interaction with up to 8 neighbors is allowed on this device.

```
Orion_B54Q#conf terminal
Orion_B54Q(config)#ipv6 router ospf max-concurrent-dd 4
```

Related Commands	Command	Description
	max-concurrent-dd	Sets the maximum concurrent interacting neighbors in the OSPFv3 processes

Platform N/A

Description

3.34 log-adj-changes

Use this command to enable the logging of adjacency changes. Use the **no** form of this command to restore the default setting.

log-adj-changes [detail]
no log-adj-changes [detail]

Parameter Description	Parameter	Description
	detail	Displays details of adjacency changes

Defaults By default, the adjacency state log on the entry of or exit from the FULL state is output.

Command Mode Routing process configuration mode

Usage Guide N/A

Configuration Examples The following example turns on the log of adjacency state change.

```
Orion_B54Q(config)# router ospf 1
Orion_B54Q(config)# log-adj-changes detail
```

Related Commands	Command	Description
	show ipv6 ospf	Displays the OSPF global configuration information

Platform Description N/A

3.35 max-concurrent-dd

Use this command to set the maximum number of DD packets that can be processed concurrently in the OSPFv3 routing process. Use the **no** form of this command to restore the default setting.

max-concurrent-dd number
no max-concurrent-dd

Parameter Description	Parameter	Description
	<i>number</i>	Maximum number of DD packets that can be processed concurrently, in the range from 1 to 65535.

Defaults The default is 5.

Command Mode Routing process configuration mode.

Usage Guide When a router is exchanging data with multiple neighbors at the same time which affects its performance, by configuring this command, the maximum concurrent interacting neighbors allowed in each OSPFv3 instance can be restricted.

Configuration Examples The following example sets the maximum concurrent interacting neighbors allowed in the current OSPFv3 routing process to 4. The result is that in the interaction between a large number of neighbors, interactions with up to 4 neighbors are allowed to be initiated on this device concurrently, and interactions initiated by up to 4 neighbors are allowed to be received concurrently. That is, interaction with up to 8 neighbors is allowed on this device.

```
router ipv6 ospf 1
max-concurrent-dd 4
```

Related Commands	Command	Description
		ipv6 router ospf max-concurrent-dd

Platform N/A
Description

3.36 passive-interface

Use this command to set the passive interface. Use the **no** form of this command to restore the default setting.

```
passive-interface { default | interface-type interface-number }
no passive-interface { default | interface-type interface-number }
```

Parameter Description	Parameter	Description	
		default	Sets all the interfaces to passive ones.
		<i>interface-type interface-number</i>	Sets the specified interface to a passive one.

Defaults No passive interface is set by default.

Command Mode Routing process configuration mode

Usage Guide After an interface is set to a passive one, it no longer receives or sends the hello message. This command applies to the interfaces participating in the OSPFv3 but not to the virtual links.

Configuration Examples The following example enables only the VLAN1 interface to participate in the OSPFv3 process.

```
passive-interface default
no passive-interface vlan 1
```

Related Commands

Command	Description
ipv6 ospf area	Configures an interface to participate in the OSPFv3 routing process.
show ipv6 ospf	Displays the OSPFv3 routing process information.
show ipv6 ospf neighbor	Displays the OSPFv3 neighbor information.

Platform N/A

Description

3.37 redistribute

Use this command to start the route redistribution in order to import the routing information of other routing protocols to the OSPFv3 routing process. Use the **no** form of this command to restore the default setting.

redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static** } [{ **level-1** | **level-1-2** | **level-2** } | **match** { **internal** | **external** [1|2] | **metric** *metric-value* | **metric-type** { 1|2 } | **route-map** *route-map-name* | **tag** *tag-value*]

no redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **rip** | **static** } [{ **level-1** | **level-1-2** | **level-2** } | **match** { **internal** | **external** [1|2] | **metric** | **metric-type** { 1|2 } | **route-map** *route-map-name* | **tag** *tag-value*]

Parameter Description

Parameter	Description
bgp	The bgp protocol is redistributed.
connected	The directly connected route is redistributed.
isis [<i>area-tag</i>]	The isis is redistributed. The area-tag specifies a particular isis instance.
ospf <i>process-id</i>	The ospf is redistributed. The process-id specifies a particular ospf instance within the range of 1-65535.
rip	The rip is redistributed.
static	The static route is redistributed.
level-1 level-1-2 level-2	It is used in the IS-IS route redistribution only and redistributes the routes at a specified level. .
match	It is used in the OSPFv3 route redistribution only and filters specific routes for redistribution; internal: inter-area and intra-area routes. external [1 2]: E1, E2 or all external routes. Nssa-external [1 2]: N1, N2 or all external routes of the NSSA area. All sub-type OSPFv3 routes are redistributed by default.

metric <i>metric-value</i>	Specifies the metric for the OSPFv3 external 2 LSA with <i>metric-value</i> . Its range is 0 to 16777214.
metric-type { 1 2 }	Set the metric type for the external route to E-1 or E-2.
route-map <i>map-map-name</i>	Specifies the routing policy for route redistribution. The name of map-tag can be composed of up to 32 characters. No route-map is associated by default.
tag <i>tag-value</i>	Specifies the tag value redistributed to the OSPFv3 inner route, in the range of 0 to 4294967295.

Defaults

The function is disabled by default;

Metric-type: 2;

Level-2 routes are redistributed in the ISIS redistribution

OSPFv3 routes of all sub-types are redistributed in the OSPFv3 redistribution

No route-map is associated

Command**Mode**

Routing process configuration mode

Usage Guide

When a device supports multiple routing protocols, the coordination between these protocols becomes an important task. The device can run the protocols at the same time, so it should redistribute the protocols. This is applicable to all IP routing protocols.

The parameters level-1, level-2 or level-1-2 can be configured in the redistribution of the ISIS routes to indicate the level of the routes in the redistribution. By default, the level-2 ISIS routes are redistributed

When redistributing OSPFv3 routes, you can configure *match* to redistribute the routes of the corresponding sub-type among the redistributed OSPFv3 routes. All types of OSPFv3 routes are redistributed by default.

The *match* parameter of route-map is specific to the source of routes. The parameters *tag*, *metric* and *metric-type* of the set rule of route-map take precedence over the ones configured for the redistribute command.

 The metric value of the route-map associated should be in the range of 0 to 16777214. If the metric value is not in this range, the route cannot be introduced.

The rules for the **no** form of the **redistribute** command are as follows:

If some parameters are specified in the no command, restore their default settings;

If no parameters are specified in the **no** command, delete the whole command.

For example, if the configuration is made below:

Now modify the configuration with the command no redistribute isis 112 level-2

According to the above rules, the command only restores level-2 to default and level-2 is default per se, so after the above no command is executed, the configuration remains as redistribute isis 112 level-2

To delete the whole command, use the command below

Configuratio

The following example redistributes the direct route and associates route-map test :

n Examples

```
ipv6 router ospf 1
 redistribute connect metric 10 route-map test
```

The associated route-map is configured as follows:

```
route-map test permit 10
 match metric 20
 set metric 30
```

The effect of the above configuration is to set the metric value which is 20 of the redistributed routes to 30, and that of other routes to 10

Related Commands

Command	Description
default-information originate	Sets the default route to be redistributed.
default-metric	Sets the default metric for the route to be redistributed.
summary-prefix	Sets the converged address range of the external route.
show ipv6 ospf	Displays the OSPFv3 routing process information.
show ipv6 ospf database	Displays the OSPFv3 link state database information.

Platform N/A

Description

3.38 router-id

Use this command to set the router ID (device ID). Use the **no** form of this command to restore the default setting.

```
router-id router-id
no router-id
```

Parameter Description

Parameter	Description
<i>router-id</i>	ID of the device in the IPv4 address format.

Defaults

The OSPFv3 routing process, the largest IPv4 address of all loopback interfaces is elected as the router ID; If there is no loopback interface with an IPv4 address, the OSPFv3 process will elect the largest IPv4 of all other interfaces as the router ID

Command Mode

Routing process configuration mode

Usage Guide

Each device that runs the OSPFv3 process shall be identified with a router ID. Router ID is in the format of IPv4 address.
Any IPv4 address can be set as the router ID, but the router ID of every routers in the AS must be

unique. If multiple OSPFv3 processes are running on the same device, the router ID of every process must be unique. Note that the change of the router ID results in considerable processing work in the protocol. Therefore, it is not recommended to change any router ID without proper reason. A prompt will be given to ask whether you are sure to modify the router ID. It is recommended that you specify a router ID once an OSPFv3 process starts before configuring other parameters for the process

Configuration Examples The following example sets the ID of the device that participates in the OSPFv3 process to 1.1.1.1.

```
router-id 1.1.1.1
```

Related Commands

Command	Description
ipv6 ospf priority	Sets the interface priority.
show ipv6 ospf	Displays the OSPFv3 routing process information.

Platform N/A
Description

3.39 summary-prefix

Use this command to configure the converged route outside the OSPFv3 routing domain in the routing process configuration mode. Use the **no** form of this command to restore the default setting.
summary-prefix *ipv6-prefix/prefix-length* [**not-advertise** | **tag** < 0-4294967295 >]
no summary-prefix *ipv6-prefix/prefix-length* [**not-advertise** | **tag** < 0-4294967295 >]

Parameter Description

Parameter	Description
<i>ipv6-prefix/prefix-length</i>	Address range of the converged route
not-advertise	Does not advertise the converged route to neighbors. Absence of this parameter means to advertise.
tag <0-4294967295>	Tag value redistributed to the OSPFv3 inner route, in the range from 0 to 4294967295.

Defaults No converged route is configured by default.

Command Mode Routing process configuration mode.

Usage Guide When routes are redistributed by another routing process into the OSPFv3 routing process, every route is advertised to the OSPFv3-enabled device separately in the form of external link state. If the incoming routes are continuous addresses, the autonomous system border device can advertise only one converged route, thus reducing the scale of routing table greatly. It is different from the **area range** command. The area range involves the convergence of routes between OSPFv3 areas, while the **summary-prefix** involves the convergence of external routes of

the OSPFv3 routing domain.

Configuring the **summary-prefix** command on the ASBR can perform convergence for only redistributed routes; while configuring this command on the NSSA ABR translator can perform convergence for the redistributed routes and the Type-5 routes translated from Type-7.

Configuration Examples The following example configures the external route within the 2001:DB8::/64 to the converged route 2001:DB8::/64 to advertise it.

```
summary-prefix 2001 :DB8 : : /64
```

Related Commands	Command	Description
	area-range	Configures route convergence between the OSPFv3 areas.
	redistribute	Redistributes the routes in other routing process.

Platform N/A
Description

3.40 show ipv6 ospf

Use this command to display the information of the OSPFv3 process.

show ipv6 ospf [*process-id*]

Parameter Description	Parameter	Description
		<i>process- id</i>

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the information about the OSPFv3 process.

```
Orion_B54Q# show ipv6 ospf
Routing Process "OSPFv3 (1)" with ID 1.1.1.1
Process uptime is 24 minutes
Enable two-way-maintain
SPF schedule delay 5 secs, Hold time between SPFs 10 secs
Initial LSA throttle delay 0 msec
Minimum hold time for LSA throttle 5000 msec
Maximum wait time for LSA throttle 5000 msec
Lsa Transmit Pacing timer 40 msec, 1 LS-Upd
LSA interval 5 secs, Minimum LSA arrival 1000 msec
```

```
Pacing lsa-group: 30 secs
Number of incoming current DD exchange neighbors 0/5
Number of outgoing current DD exchange neighbors 0/5
Number of external LSA 0. Checksum Sum 0x0000
Number of AS-Scoped Unknown LSA 0
Number of LSA originated 11
Number of LSA received 4
Log Neighbor Adjacency Changes : Enabled
Number of areas in this router is 2
Area BACKBONE(0)
Number of interfaces in this area is 1(1)
SPF algorithm executed 4 times
Number of LSA 3. Checksum Sum 0x1DDF1
Number of Unknown LSA 0
  Area 0.0.0.1 (NSSA)
    Number of interfaces in this area is 1(1)
    SPF algorithm executed 5 times
    Number of LSA 7. Checksum Sum 0x445FE
    Number of Unknown LSA 0
NSSA Translator State is elected
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
default-information originate	Sets the default route to be redistributed.
default-metric	Sets the default metric for the route to be redistributed.
<i>router-id</i>	Sets the OSPFv3 routing process ID
timers spf	Sets the delay and the minimum and maximum intervals for the OSPFv3 to perform SPF calculation after receiving the topology change information.

Platform N/A
Description

3.41 show ipv6 ospf database

Use this command to display the database information of the OSPFv3 process

show ipv6 ospf [process- id] database [lsa-type [adv-router router-id]]

Parameter Description

Parameter	Description
-----------	-------------

<i>process- id</i>	OSPF process ID number
<i>lsa-type</i>	The LSA types are as follows: NSSA-external-LSA, AS-external-LSAs, Link-LSAs, Inter-Area-Prefix-LSAs, Inter-Area-Router-LSAs, Intra-Area-Prefix-LSAs, Network-LSAs, Router-LSAs If this parameter is not specified, all LSA information will be displayed.
adv-router <i>router-id</i>	Displays the LSA information generated by the specified router.

Defaults N/A

Command Privileged EXEC mode.

Mode

Usage Guide N/A

Configuration Examples The following example displays the information about the OSPFv3 process database.

```

Orion_B54Q# show ipv6 ospf database
OSPFv3 Router with ID (1.1.1.1) (Process 1)
Link-LSA (Interface FastEthernet 1/0)
Link State ID   ADV Router     Age  Seq#           CkSum  Prefix
0.0.0.2         1.1.1.1       197  0x80000001    0x7cd8  0
0.0.0.5         2.2.2.2       206  0x80000001    0x8c86  0
Link-LSA (Interface Loopback 1)
Link State ID   ADV Router     Age  Seq#           CkSum  Prefix
0.0.64.1        1.1.1.1       82   0x80000001    0xb760  0
Router-LSA (Area 0.0.0.0)
Link State ID   ADV Router     Age  Seq#           CkSum  Link
0.0.0.0         1.1.1.1       17   0x80000006    0x62a1  1
0.0.0.0         2.2.2.2       156  0x80000003    0x8653  1
Network-LSA (Area 0.0.0.0)
Link State ID   ADV Router     Age  Seq#           CkSum
0.0.0.5         2.2.2.2       157  0x80000001    0xf8f6
Router-LSA (Area 0.0.0.1)
Link State ID   ADV Router     Age  Seq#           CkSum  Link
0.0.0.0         1.1.1.1       17   0x80000002    0x0529  0
Inter-Area-Prefix-LSA (Area 0.0.0.1)
Link State ID   ADV Router     Age  Seq#           CkSum
0.0.0.1         1.1.1.1       77   0x80000002    0x83b4
AS-external-LSA
Link State ID   ADV Router     Age  Seq#           CkSum
0.0.0.1         1.1.1.1       1    0x80000001    0x6035  E2
    
```

Related Commands

Command	Description
---------	-------------

ipv6 router ospf	Starts the OSPFv3 routing process.
-------------------------	------------------------------------

Platform N/A
Description

3.42 show ipv6 ospf interface

Use this command to display the OSPFv3 interface information.

show ipv6 ospf [*process- id*] **interface** [*interface-type interface-number* | **brief**]

Parameter Description	Parameter	Description
	<i>interface-type interface-number</i>	Specifies the interface type and interface number.
	<i>process- id</i>	OSPFv3 process ID
	brief	Displays the interface summary.

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

Configuration Examples The following example displays the information about the OSPFv3 interface.

```
Orion_B54Q# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
```

If the BFD has been enabled for the neighbor on the interface, the content of “BFD enabled” is also displayed. For example:

```

Orion_B54Q# show ipv6 ospf interface
FastEthernet 1/0 is up, line protocol is up
Interface ID 2
IPv6 Prefixes
fe80::2d0:22ff:fe22:2223/64 (Link-Local Address)
OSPFv3 Process (1), Area 0.0.0.0, Instance ID 0
Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1, BFD enabled
Designated Router (ID) 2.2.2.2
Interface Address fe80::c800:eff:fe84:1c
Backup Designated Router (ID) 1.1.1.1
Interface Address fe80::2d0:22ff:fe22:2223
Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5
Hello due in 00:00:02
Neighbor Count is 1, Adjacent neighbor count is 1
Hello received 26 sent 26, DD received 5 sent 4
LS-Req received 1 sent 1, LS-Upd received 3 sent 6
LS-Ack received 6 sent 2, Discarded 0
    
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
ipv6 ospf area	Enables the interface to participate in the OSPFv3 process.

Platform N/A
Description

3.43 show ipv6 ospf neighbor

Use this command to display the neighbor information of the OSPFv3 process.

```

show ipv6 ospf [ process- id ] neighbor [ interface-type interface-number [ detail ] | neighbor-id | detail ]
    
```

Parameter Description

Parameter	Description
<i>process- id</i>	OSPFv3 process ID number
detail	Displays details about the neighbor.
<i>interface-type interface-number</i>	Interface type and interface number
<i>neighbor-id</i>	Neighbor's router ID

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The following command displays the brief information about the OSPFv3 neighbor.

```
Orion_B54Q# show ipv6 ospf neighbor
OSPFv3 Process (1), Neighbors, 1 is Full:
Neighbor ID      Pri   State           Dead Time   Interface
Instance ID
2.2.2.2          1    Full/DR         00:00:33   FastEthernet 1/0    0
```

The following command displays the details of OSPFv3 neighbors:

```
Orion_B54Q# show ipv6 ospf neighbor detail
Neighbor 2.2.2.2, interface address fe80::c800:eff:fe84:1c
  In the area 0.0.0.0 via interface FastEthernet 1/0
  Neighbor priority is 1, State is Full, 6 state changes
  DR is 2.2.2.2 BDR is 1.1.1.1
  Options is 0x000013 (-|R|-|-|E|V6)
  Dead timer due in 00:00:36
  Database Summary List 0
  Link State Request List 0
Link State Retransmission List 0
```

If the BFD has been enabled for the forwarding path of the neighbor , the content of “BFD session state up” is added to the information displayed. For example:

```
Orion_B54Q# show ipv6 ospf neighbor detail
Neighbor 2.2.2.2, interface address fe80::c800:eff:fe84:1c
  In the area 0.0.0.0 via interface FastEthernet 1/0
  Neighbor priority is 1, State is Full, 6 state changes
  DR is 2.2.2.2 BDR is 1.1.1.1
  Options is 0x000013 (-|R|-|-|E|V6)
  Dead timer due in 00:00:36
  Database Summary List 0
  Link State Request List 0
Link State Retransmission List 0
  BFD session state up
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
ipv6 ospf area	Enables the interface to participate in the OSPFv3 process.
area virtual-link	Configures the OSPFv3 virtual link.
show ipv6 ospf interface	Displays the OSPFv3 interface information.

Platform N/A

Description

3.44 show ipv6 ospf restart

Use this command to display the OSPFv3 graceful restart configuration.

show ipv6 ospf [*process- id*] restart

Parameter Description	Parameter	Description
	<i>process- id</i>	OSPFv3 process ID number.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the restarter status.

```
Orion_B54Q# show ipv6 ospf restart
Routing Process is ospf 1
Graceful-restart enabled
Restart grace period 120 secs
Current Restart status is plannedRestart
Current Restart remaining time 50 secs
Graceful-restart helper support enabled
```

The following example displays the helper status.

```
Orion_B54Q# show ipv6 ospf restart
Routing Process is ospf 1
Neighbor 10.1.1.2, interface addr 10.1.1.2
In the area 0.0.0.0 via interface GigabitEthernet 6/0/0
Graceful-restart helper enabled
Current helper status is helping
Current helper remaining time 50 secs
```

Related Commands	Command	Description
	ipv6 router ospf	Starts the OSPFv3 routing process.

Platform Description N/A

3.45 show ipv6 ospf route

Use this command to display the OSPFv3 route information.

show ipv6 ospf [process- id] route [count]

Parameter Description	Parameter	Description
	<i>process- id</i>	OSPFv3 process ID number.
	count	Total number of OSPFv3 routes

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the information about OSPFv3 routes.

```
Orion_B54Q# show ipv6 ospf route
OSPFv3 Process (1)
Codes: C - connected, D - Discard, 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
Metric  Next-hop
E2 2001:DB8:1::/64  1/20    via fe80::c800:eff:fe84:1c, FastEthernet 1/0
O  2001:DB8:2::/64  11     via fe80::c800:eff:fe84:1c, FastEthernet
1/0, Area 0.0.0.0
```

Related Commands	Command	Description
	ipv6 router ospf	Starts the OSPFv3 routing process.

Platform Description N/A

3.46 show ipv6 ospf summary-prefix

Use this command to display the external route convergence information of OSPFv3

show ipv6 ospf [process- id] summary-prefix

Parameter Description	Parameter	Description
	<i>process- id</i>	OSPFv3 process ID number

Defaults N/A

Command Privileged EXEC mode.

Mode

Usage Guide N/A

Configuration Examples The following example displays the external route convergence information of OSPFv3.

```
Orion_B54Q# show ipv6 ospf summary-prefix
OSPFv3 Process 1, Summary-prefix:
2001:db8::/64, Metric 16777215, Type0, Tag0, Match count0, advertise
```

Related Commands	Command	Description
	ipv6 router ospf	Starts the OSPFv3 routing process.
	summary-prefix	Configures the converge route outside the OSPFv3 routing domain.

Platform N/A

Description

3.47 show ipv6 ospf topology

Use this command to display the topology information about each area of OSPFv3.

show ipv6 ospf [process- id] topology [area area-id]

Parameter Description	Parameter	Description
	<i>process- id</i>	OSPFv3 process ID number
	<i>area-id</i>	Area ID

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The following command displays the topology information about each area of OSPFv3.

```
Orion_B54Q# show ipv6 ospf topology
OSPFv3 Process (1)
OSPFv3 paths to Area (0.0.0.0) routers
Router ID      Bits  Metric  Next-Hop
Interface
1.1.1.1        EB  --
2.2.2.2        E   1       2.2.2.2
FastEthernet 1/0
```

```
OSPFv3 paths to Area (0.0.0.1) routers
Router ID      Bits  Metric  Next-Hop
Interface
1.1.1.1       B    --
```

1

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
area range	Configures the address range of the OSPF area.

Platform N/A

Description

3.48 show ipv6 ospf virtual-links

Use this command to display the virtual link information of the OSPFv3 process

show ipv6 ospf [process- id] virtual-links

Parameter Description

Parameter	Description
<i>process- id</i>	OSPFv3 process ID number

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

Configuration Examples The following command displays the information about the OSPFv3 virtual link.

```
Orion_B54Q# show ipv6 ospf virtual-links
Virtual Link VLINK1 to router 2.2.2.2 is down
  Transit area 0.0.0.1 via interface FastEthernet 1/0, instance ID 0
  Local address *
  Remote address 3333::1/128
  Transmit Delay is 1 sec, State Down,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in inactive
  Adjacency state Down
```

Related Commands

Command	Description
ipv6 router ospf	Starts the OSPFv3 routing process.
area virtual-link	Configures the OSPFv3 virtual link.

show ipv6 ospf neighbor	Displays the OSPFv3 neighbor information.
--------------------------------	---

Platform N/A

Description

3.49 timers lsa arrival

Use this command to configure a delay for receiving repeated LSAs. Use the **no** form of this command to restore the default setting.

timers lsa arrival arrival-time

no timers lsa arrival

Parameter Description	Parameter	Description
	<i>arrival-time</i>	Specifies the delay for receiving repeated LSAs. The range is from 0 to 600000 in the unit of milliseconds.

Defaults The default is 1000.

Command Mode Routing process configuration mode

Usage Guide Configure the device not to process repeated LSAs received within the specific delay.

Configuration Examples The following example sets the delay for receiving repeated LSAs to 2 seconds.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# timers lsa arrival 2000
```

Related Commands	Command	Description
	show ipv6 ospf	Displays OSPFv3 process information, including identifiers of routing devices.

Platform N/A

Description

3.50 timers pacing lsa-group

Use this command to set an LSA group pace interval. Use the **no** form of this command to restore the default setting.

timers pacing lsa-group seconds

no timers pacing lsa-group

Parameter Description	Parameter	Description
-----------------------	-----------	-------------

seconds	Specifies the LSA group pace interval. The range is from 10 to 1800 in the unit of seconds. The default value is 30.
---------	--

Defaults The default is 30.

Command Mode Routing process configuration mode

Usage Guide Each LSA has its own lifetime, that is, LSA aging time. An LSA existing for 1800s will be refreshed so that the living time of the LSA will not exceed its aging time. This ensures that normal LSAs are not cleared due to timeout of aging time. If update and aging operations of each LSA are separately computed, a large number of CPU resources will be consumed.

To effectively utilize CPU resources, configure the device to group LSAs for uniform refreshment. The time for refreshing a group of LSAs is called an LSA group pace interval. Grouping refreshment is to put the LSAs to be refreshed within an LSA group pace interval into a group and refresh them uniformly.

When the number of LSAs is fixed, a longer LSA group pace interval will allow the CPU to process more LSAs when the timer expires for one time. To keep the stability of the CPU, you are recommended not to set an over long LSA group pace interval. This prevents the CPU from processing excessive LSAs when the timer expires each time. If the CPU processes a large number of LSAs each time, it is recommended to shorten the LSA group pace interval. For example, if the database has 10000 LSAs, you need to reduce the LSA group pace interval. If it has only 40 to 100 LSAs, you can adjust the group pace interval to 10 through 20 minutes.

Configuration Examples The following example sets the LSA group pace interval to 120 seconds.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)#timers pacing lsa-group 120
```

Related Commands	Command	Description
	<code>show ipv6 ospf</code>	Displays OSPFv3 configuration information.

Platform N/A
Description

3.51 timers pacing lsa-transmit

Use this command to set an interval for sending LSA groups. Use the **no** form of this command to restore the default setting.

timers pacing lsa-transmit *transmit-time transmit-count*

no timers pacing lsa-transmit

Parameter Description	Parameter	Description
	<i>transmit-time</i>	Specifies the interval for sending LSA groups. The range is from 10

	to 1000 in the unit of milliseconds.
<i>transmit-count</i>	Specifies the number of LS-UPD packets in an LSA group. The range is from 1 to 200.

Defaults The default transmit-time is 40 and the transmit-count is 1.

Command Mode Routing process configuration mode

Usage Guide There are usually a lot of LSAs on a network; therefore, the load of the device is very high. Setting proper **transmit-time** and **transmit-count** values can restrict flooding of LS-UPD packets on the network.
When the CPU load is not high and network bandwidth usage is not large, you can reduce the **transmit-time** value and increase the **transmit-count** value to accelerate route convergence.

Configuration Examples The following example sets the interval for sending LS-UPDs to 50 milliseconds and the specified 20 packets to be sent each time.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# timers pacing lsa-transmit 50 20
```

Related Commands	Command	Description
	show ipv6 ospf	Displays OSPFv3 process information.

Platform Description N/A

3.52 timers spf

Use this command to set the delay and interval for the OSPFv3 to calculate SPF after receiving the topology change. Use the **no** format of this command to restore the default setting.

timers spf delay holdtime
no timers spf

Parameter Description	Parameter	Description
	<i>spf-delay</i>	Defines the waiting time for the SPF calculation, which ranges from 0 to 214748364 seconds. After receiving the topology change information, the OSPF routing process has to waiting for a given period before making the SPF calculation.
	<i>spf-holdtime</i>	Defines the interval between two SPF calculations, which ranges from 0 to 214748364 seconds. If the interval has not passed even if the waiting time has elapsed, no SPF calculation can be made yet.

Defaults There are two default situations: 1. The versions earlier than NOS 10.4 do not support the command **timers throttle spf**. The system default is **timers spf 5 10**. 2. The NOS 10.4 and the later versions

do support the command **timers throttle spf**, where **timer spf** takes no effect by default. The delay for SPF calculation is subject to the default setting of the command **timers throttle spf**. Refer to the description of the command.

Command Mode Routing process configuration mode

Usage Guide The smaller the *spf-delay* and *spf-holdtime*, the shorter time the OSPF takes to adapt to the topology change, but the more CPU time will be used of the router.

▲ The **timer spf** configuration and the **timers throttle spf** configuration will overwrite each other.

Configuration Examples The following example sets the delay and holdtime of the OSPFv3 to 3 seconds and 9 seconds respectively.

```
Orion_B54Q(config)# ipv6 router ospf 20
Orion_B54Q(config-router)# timers spf 3 9
```

Related Commands

Command	Description
clear ipv6 ospf	Restarts part of the function of the OSPFv3.
show ipv6 ospf	Displays the OSPFv3 routing process information.
timers throttle spf	Configures the exponential backoff delay of the SPF calculation

Platform Description N/A

3.53 timers throttle lsa all

Use this command to configure an exponential backoff algorithm for generating LSAs. Use the **no** form of this command to restore the default setting.

timers throttle lsa all *delay-time hold-time max-wait-time*
no timers throttle lsa all

Parameter Description


Parameter	Description
<i>delay-time</i>	Specifies a shortest LSA generation delay, in milliseconds (the first batch of LSAs is usually generated immediately). The range is from 0 to 600000 in the unit of milliseconds.
<i>hold-time</i>	Specifies a shortest interval between the first two times of LSA refreshment, in milliseconds. The range is from 1 to 600000 in the unit of milliseconds
<i>max-wait-time</i>	Specifies a longest interval for consecutive two times of LSA refreshment, in milliseconds. The value is used to determine whether

	LSAs are refreshed consecutively. The range is from 1 to 600000 in the unit of milliseconds.
--	---

Defaults The default *delay-time* is 0, *hold-time* is 5000 and *max-wait-time* is 5000.

Command Mode Routing process configuration mode

Usage Guide If high route convergence capability is needed when links are changed, set a small *delay-time* value. To reduce CPU consumption, you can properly increase the values of the parameters.

 The *hold-time* value cannot be smaller than the *delay-time* value and must be smaller than or equal to the *max-wait-time* value.

Configuration Examples The following example sets *delay-time* to 10 milliseconds, *hold-time* to one second, and *max-wait-time* to five seconds.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# timers throttle lsa all 10 1000 5000
```

Related Commands	Command	Description
		show ipv6 ospf

Platform Description N/A

3.54 timers throttle route

Use this command to configure the delay time of route calculation on receiving the ASBR summary LSA and the external summary LSA. Use the **no** form of this command to restore the default setting.

timers throttle route { inter-area ia-delay | ase ase-delay }

no timers throttle route { inter-area | ase }

Parameter Description	Parameter	Description
		inter-area
	<i>ia-delay</i>	Sets the delay time of the inter-area route calculation, in the range from 0 to 600000 in the unit of milliseconds. On receiving the ASBR summary LSA, the router will not calculate the inter-area routes until the <i>ia-delay</i> time runs out.
	ase	Calculates the external routes.
	<i>ase-delay</i>	Sets the delay time of the external route calculation, in the range from 0 to 600000 in the unit of milliseconds. On receiving the external summary LSA, the router will not calculate the external routes until the <i>ase-delay</i> time runs out.

Defaults The default *ia-delay* is 0 and *ase-delay* is 0.

Command

Mode Routing process configuration mode

Usage Guide The default setting is recommended if the network needs to be fast converged. For the instable network where multiple inter-area and external routes exist, if you want to optimize the route calculation and save the CPU resources, increase the delay time.

Configuration Examples The following example sets the delay time of the inter-area route calculation to one second.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# timers throttle route inter-area 1000
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

3.55 timers throttle spf

Use this command to configure, the delay for SPF calculation as well as the minimum and maximum intervals between two SPF calculations after receiving the topology change information for OSPFv3 in the routing process configuration mode. Use the **no** form of this command to restore the default setting.

timers throttle spf *spf-delay* *spf-holdtime* *spf-max-waittime*

no timers throttle spf

Parameter Description

Parameter	Description
<i>spf-delay</i>	Specifies an SPF calculation delay after the topology change information is received. The range is from 1 to 600000 in the unit of milliseconds.
<i>spf-holdtime</i>	Specifies a shortest interval between two SPF calculations. The range is from 1 to 600000 in the unit of milliseconds.
<i>spf-max-waittime</i>	Specifies a longest interval between two SPF calculations. The range is from 1 to 600000 in the unit of milliseconds.

Defaults The default *spf-delay* is 1000. *spf-holdtime* is 5000 and *spf-max-waittime* is 10000.

Command

Mode Routing process configuration mode.

Usage Guide *Spf-delay* refers to the delay from the topology change to the SPF calculation. *Spf-holdtime* refers to

the minimum interval between the first and the second SPF calculations. Then, the interval of the consecutive SPF calculations is at least twice as the last interval till it reaches to *spf-max-waittime*. If the interval between two SPF calculations has exceeded the required minimum value, the interval of SPF calculation will re-start from *spf-holdtime*.

Smaller *spf-delay* and *spf-holdtime* value can make the topology convergence faster. Greater *spf-max-waittime* value can reduce the SPF calculations. Those configuration are flexible according to the actual stability of the network topology.

Compared with the timers spf command, this command is more flexible. It not only speeds up the SPF convergence calculation, but also reduces the system resources consumption of SPF calculation as the topology changes continuously. Therefore, the timers throttle spf command is recommended.

- ❗ The spf-holdtime cannot be smaller than spf-delay, or the spf-holdtime will be set to be equal to spf-delay;
- ❗ The spf-max-waittime cannot be smaller than spf-holdtime, or the spf-max-waittime will be set to be equal to spf-holdtime automatically;
- ❗ The configuration of the timers spf command and of the timers throttle spf command are overwritten each other.
- ❗ With neither timers spf command nor timers throttle spf command configured, the default value refers to the default of the timers throttle spf command

Configuration Examples

The following example configures the delay and holdtime and the maximum time interval of the OSPFv3 as 5ms, 1000ms and 90000ms respectively. If the topology changes consecutively, the time for SPF calculation is: five milliseconds, one second, three seconds, seven seconds, 15 seconds, 31 seconds, 63 seconds, 89 seconds, 179 seconds, 179+90 seconds.....

```
Orion_B54Q(config)# ipv6 router ospf 20
Orion_B54Q(config-router)# timers spf 5 1000 90000
```

Related Commands

Command	Description
clear ipv6 ospf	Restarts part of the OSPFv3 function.
show ipv6 ospf	Displays the routing process information of the OSPFv3
timers spf	Configures the SPF calculation delay .

Platform N/A

Description

3.56 two-way-maintain

Use this command to enable two-way OSPFv3 maintenance. Use the **no** form of this command to disable this function.

two-way-maintain

no two-way-maintain

Parameter Description	Parameter	Description
		N/A

Defaults Two-way OSPFv3 maintenance is enabled by default.

Command Mode Routing process configuration mode

Usage Guide Sometimes, there are a lot of sent and received packets on a network, occupying large CPU and memory resources. As a result, some packets cannot be processed immediately or are directly lost. If hello packets from a neighbor cannot be processed within the dead interval of neighbors, the connection with the neighbor will be interrupted due to connection timeout. If two-way OSPFv3 maintenance is enabled and a large number of packets exist on the network, besides hello packets, the two-way neighboring relationship between the device and the neighbor can also be maintained by DD, LSU, LSR, and LSAck packets from the neighbor. This prevents the neighboring relationship from failing due to receiving delay or discarding of hello packets.

Configuration Examples The following example disables two-way OSPFv3 maintenance.

```
Orion_B54Q(config)# ipv6 router ospf 1
Orion_B54Q(config-router)# no two-way-maintain
```

Related Commands	Command	Description
		show ipv6 ospf

Platform Description N/A

4 IS-IS Commands

4.1 address-family ipv6

Use this command to enter the **address-family ipv6** mode. Use the **no** form of this command to delete all configurations in the **address-family ipv6**.

address-family ipv6 [*unicast*]

no address-family ipv6 [*unicast*]

Parameter Description	Parameter	Description
	<i>unicast</i>	IPv6 unicast address prefix.

Defaults By default, no address-family ipv6 is configured.

Command Mode IS-IS routing process configuration mode

Usage Guide This command is used for the IPv6 special configurations.
To exit to the IS-IS routing process configuration mode, use the **exit-address-family** command.

Configuration Examples

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# address-family ipv6 unicast
```

Related Commands	Command	Description
	exit-address-family	Exits the address-family ipv6 mode.

Platform Description N/A

4.2 adjacency-check

Use this command to detect protocols supported by the adjacency in the Hello packets. Use the **no** form of this command is to cancel this detection.

adjacency-check

no adjacency-check

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, this detection is enabled.

Command IS-IS routing process configuration mode or address-family ipv6 mode
Mode

Usage Guide N/A

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# adjacency-check
Orion_B54Q(config-router)# address-family ipv6
Orion_B54Q(config-router-af)# adjacency-check
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

4.3 area-password

Use this command to set the plain-text authentication password for the Level-1 area. Use the **no** form of this command to cancel the password set.

area-password *password-string* [**send-only**]

no area-password [**send-only**]

Parameter Description	Parameter	Description
	<i>password-string</i>	Character string of the plaintext authentication password with the longest length being 254 characters..
	send-only	Specifies the plaintext authentication password of Level-1 area applicable to the packets sent only, but not to the packets received.

Defaults By default, no authentication password is set.

Command IS-IS routing process configuration mode
Mode

Usage Guide IS-IS routing process configuration mode
 Configure this command to perform the authentication on the LSP, CSPN and PSNP packets received in the Level-1 domain and send the packets taking with the authentication information. In the same area, all IS-IS devices must be configured the same password.
 If the **authentication mode** command has been executed, this command will not be configured successfully. You need to delete the **authentication mode** command first.
 Running the **no area-password send-only** command can only disable the **send-only** option.

Configuratio The following example specifies the authentication in the IS-IS area using the plaintext mode with

n Examples the password being *redgiant* and the password applicable to the packets sent only, but not to the packets received.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# area-password redgiant send-only
```

Related Commands

Command	Description
domain-password	Sets the Level-2 domain password.
authentication mode	Specifies the IS-IS authentication mode.

Platform N/A

Description

4.4 authentication key-chain

Use this command to specify the key-chain used by the IS-IS authentication. Use the **no** form of this command to cancel the key-chain specified.

```
authentication key-chain name-of-chain [ level-1 | level-2 ]
no authentication key-chain name-of-chain [ level-1 | level-2 ]
```

Parameter Description

Parameter	Description
<i>name-of-chain</i>	Key-chain name with the maximum length being 255.
level-1	Specifies the authentication key-chain of the Level-1.
level-2	Specifies the authentication key-chain of the Level-2.

Defaults By default, the authentication key-chain is not specified.

Command N/A

Mode

Usage Guide

If the **key chain** command is not used to configure the corresponding key-chain, the authentication will not be performed. In addition, to make the IS-IS key-chain authentication effective, you need to configure the **authentication mode** command at the same time.

This key-chain can apply to the plain-text authentication mode and MD5 encrypted authentication mode. You can use the **authentication mode** command to set the authentication mode.

The length of the password key-string in the key-chain shall not be larger than 254 characters if the plain-text authentication mode is used, otherwise this configuration will fail.

Only one key-chain is used at one time. So, when configuring this command, the said key-chain will be replaced by the new specified one.

If the Level is not specified, the key-chain will apply to both Level-1 and Level-2.

The key-chain specified by this command works on the LSP,CSNP and PSNP packets. The IS-IS will send or receive the password that belongs to this key-chain.

There may contain multiple passwords in the key-chain. When sending the packets, use the password with small number first. While receiving the packets, the packet will be received as long as

the password of this packet received corresponds to any password in the key-chain.

Configuration Examples

The following example specifies the authentication in the IS-IS area using the key-chain named *kc*:

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# authentication key-chain kc level-1
```

Related Commands

Command	Description
authentication mode	Specifies the IS-IS authentication mode.
authentication send-only	Specifies the IS-IS authentication applicable to the sent packets only, but not to packets received.
key-chain	Configures the key-chain.

Platform N/A
Description

4.5 authentication mode

Use this command to specify the mode of IS-IS authentication. Use the **no** form of this command to cancel the specified IS-IS authentication mode.

authentication mode { **md5** | **text** } [**level-1** | **level-2**]

no authentication mode { **md5** | **text** } [**level-1** | **level-2**]

Parameter Description

Parameter	Description
md5	Specifies the MD5 authentication mode to use.
text	Specifies the plain-text authentication mode to use.
level-1	Specifies the authentication mode taking effect on the Level-1.
level-2	Specifies the authentication mode taking effect on the Level-2.

Defaults By default, the authentication mode is not specified.

Command Mode IS-IS routing process configuration mode

Usage Guide To make the key-chain configured by the **authentication key-chain** command effective, you must use the **authentication mode** command to specify the authentication mode.

If no Level is specified, the authentication mode specified is applicable to both Level-1 and Level-2. When configuring the **authentication mode** command, if the **area-password** or **domain-password** command has been executed to configure the plaintext authentication before, the said commands will be overwritten by the new command..

If the **authentication mode** command has been configured, the **area-password** or **domain-password** will not be configured successfully, you need to delete the **authentication mode** command first.

Configuration Examples The following example specifies authentication in the IS-IS area to be the MD5 authentication mode.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# authentication mode md5 level-1
```

Related Commands

Command	Description
area-password	Sets the area plaintext authentication password.
authentication key-chain	Specifies the key-chain used by the IS-IS authentication.
authentication send-only	Specifies the IS-IS authentication applicable to the packets sent only, but not to the packets received.
domain-password	Sets the domain plaintext authentication password.

Platform N/A

Description

4.6 authentication send-only

Use this command to specify the IS-IS authentication only applicable to the packets sent, but not to the packets received. Use the **no** form of this command to perform the authentication on the packets received.

```
authentication send-only [ level-1 | level-2 ]
no authentication send-only [ level-1 | level-2 ]
```

Parameter Description

Parameter	Description
level-1	Specifies setting send-only on the Level-1.
level-2	Specifies setting send-only on the Level-2.

Defaults By default, this command is not configured. If the IS-IS authentication is configured, the authentication will be performed on the packets both sent and recieved.

Command Mode IS-IS routing process configuration mode

Usage Guide With this command configured, the IS-IS will set the authentication password in the packets sent, however, the authentication will not be performed on the packets received. It can apply to the following two occasions: 1. before deploying the IS-IS authentication for all devices in the network. 2. before changing the authentication password or authentication mode. Before the above two tasks start, you need to configure the **authentication send-only** command first to make each device perform no authentication on the packets received, so as to avoid the network oscillation caused

during the subsequent authentication password deployment. After the deployment of the entire network authentication finished, execute the **no isis authentication send-only** command to cancel the **send-only** authentication mode.

This command can apply to the plain-text authentication mode and MD5 authentication mode. You can use the **authentication mode** command to set the authentication mode.

If the Level is not specified, the authentication mode specified is applicable to both Level-1 and Level-2.

Configuration Examples The following example specifies the authentication in the IS-IS area to be the **send-only** mode.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# authentication send-only level-1
```

Related Commands

Command	Description
authentication key-chain	Specifies the IS-IS authentication key-chain.
authentication mode	Specifies the mode of IS-IS authentication.
key-chain	Configures the key-chain.

Platform N/A

Description

4.7 clear clns neighbors

Use this command to clear all IS-IS neighbor relation tables.

clear clns neighbors

Parameter Description

Parameter	Description
N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is used in the condition of needing to refresh the IS-IS neighbor relation table immediately.

Configuration Examples

```
Orion_B54Q# clear clns neighbors
```

Related Commands

Command	Description
clear isis	Clears all IS-IS data structure.

Platform N/A

Description

4.8 clear isis *

Use this command to clear the data structure of all IS-ISs.

clear isis *

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is used in the condition of needing to refresh the LSP immediately. For example, after executing the **area-password** and **domain-password** commands, the previous LSPs still exist in this router, you can use this command to clear these LSPs.

Configuration Examples

```
Orion_B54Q# clear isis *
```

Related Commands	Command	Description
	clear clns neighbors	Clears all IS-IS neighbors.

Platform Description N/A

4.9 clear isis counter

Use this command to clear various statistics of IS-IS.

clear isis [tag] counter

Parameter Description	Parameter	Description
	<i>tag</i>	IS-IS instance

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples
 Orion_B54Q# **clear isis counter**

Related Commands	Command	Description
	clear isis *	Clears the data structure of all IS-ISs.

Platform Description
 N/A

4.10 default-information originate

Use this command to generate a default routing information and advertise it by LSP. Use the **no** form of this command to delete the default routing information from LSP.

default-information originate [route-map map-name]
no default-information originate [route-map map-name]

Parameter Description	Parameter	Description
	<i>map-name</i>	(Optional) Associated route-map's name, with the maximum length being 32. By default, the route-map is not associated.

Defaults
 By default, there is no default route.

Command Mode
 IS-IS routing process configuration mode or address-family ipv6 mode.

Usage Guide
 The default route is not generated in the Level-2 domain. Use this command to allow the default route to enter the Level-2 domain.

Configuration Examples
 Orion_B54Q(config)# **router isis**
 Orion_B54Q(config-router)# **default-information originate**
 Orion_B54Q(config-router)# **address-family ipv6**
 Orion_B54Q(config-router-af)# **default-information originate**

Related Commands	Command	Description
	N/A	N/A

Platform Description
 N/A

4.11 distance

Use this command to set the management distance of the IS-IS routes. Use the **no** form of this

command to restore the default settings.

distance *my-cost*

no distance

Parameter Description

Parameter	Description
<i>my-cost</i>	Distance value in the range of 1 to 255.

Defaults By default, the distance is 115.

Command Mode IS-IS routing process configuration mode

Usage Guide Use this command to configure the management distance of the IS-IS routes. The shorter the management distance, the more reliable the routing information is.

Configuration Examples
 Orion_B54Q(config) # **router isis**
 Orion_B54Q(config-router) # **distance 100**

Related Commands

Command	Description
isis metric	Sets the metric value of the interface.

Platform Description N/A

4.12 domain-password

Use this command to set the plain-text authentication password of Level-2 domain. Use the **no** form of this command to cancel the password configured.

domain-password *password-string* [**send-only**]

no domain-password [**send-only**]

Parameter Description

Parameter	Description
<i>password-string</i>	Character string of the plain-text authentication password with the longest length being 254 characters.
send-only	Specifies the plain-text authentication password of the Level-2 domain applicable to the packets sent only, but not to the packets received.

Defaults By default, no authentication password is set.

Command Mode IS-IS routing process configuration mode

Usage Guide Configure this command to perform the authentication on the LSP, CSPN and PSNP packets

received in the Level-2 domain and send the packets taking with the authentication information. In the Level-2 domain, all IS-IS devices must be configured the same password.

If the **authentication mode** command has been executed, this command will not be configured successfully. You need to delete the **authentication mode** command first.

Running the **no area-password send-only** command can only disable the **send-only** option

Configuration Examples

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# domain-password redgiant
```

Related Commands

Command	Description
area-password	Sets the plain-text authentication password of Level-1 area.
authentication mode	Specifies the IS-IS authentication mode.

Platform N/A
Description

4.13 enable mib-binding

Use this command to bind MIBs with an IS-IS process. Use the **no** form of this command to unbind the MIB from the IS-IS process.

enable mib-binding
no enable mib-binding

Parameter Description

Parameter	Description
N/A	N/A

Defaults By default, MIBs are bound with IS-IS process 1.

Command Mode IS-IS routing process configuration mode

Usage Guide By default, MIBs are bound with IS-IS process 1. The IS-IS process support multiple processes. The administrator can use this command to bind MIBs with the IS-IS process.

Configuration Examples

```
The following example binds the MIB with an IS-IS process.
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# enable mib-binding
```

Related Commands

Command	Description
graceful-restart helper disable	Disables the IS-IS GR Help capability.
isis hello-interval	Sets the interval of sending Hello packets.
isis hello-multiplier	Sets the Hello holdtime multiplier for the IS-IS

	interface.
--	------------

Platform N/A
Description

4.14 enable traps

Use this command to enable the system to send one or multiple types of IS-IS trap packets. Use the **no** form of this command to disable the system to send IS-IS trap packets.

enable traps { all | traps set }
no enable traps { all | traps set }

Parameter Description	Parameter	Description
	all	Indicates all types of IS-IS trap packets.
	<i>traps set</i>	Indicates the specified type of IS-IS trap packet.

Defaults By default, no IS-IS trap is sent.

Command Mode IS-IS routing process configuration mode

Usage Guide There are 18 types of IS-IS packets. The IS-IS packets can be classified into multiple sets. Each set includes several types of trap packets. To enable the system to send the IS-IS trap packet, you need to enable the global IS-IS trap using the **snmp-server enable traps isis** command, specify the host to receive the IS-IS trap packets, and use the **enable traps { all | traps set }** command to specify the type of IS-IS trap packet to be sent.

Configuration Examples The following example enables the system to send all IS-IS trap packets to the host of IP address 192.168.1.1.

```
Orion_B54Q# configure terminal
Orion_B54Q(config)#snmp-server enable traps isis
Orion_B54Q(config)#snmp-server host 10.1.1.1 traps version 2c public
Orion_B54Q(config)#router isis
Orion_B54Q(config-router)# enable traps all
```

Related Commands	Command	Description
	graceful-restart helper disable	Disables the IS-IS GR Help capability.
	isis hello-interval	Sets the interval of sending Hello packets.
	isis hello-multiplier	Sets the Hello holdtime multiplier for the IS-IS interface.

Platform N/A
Description

4.15 exit-address-family

Use this command to exit IS-IS address family IPv6 configuration mode and return to IS-IS routing process configuration mode.

exit-address-family

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode IS-IS address-family IPv6 configuration mode

Usage Guide N/A

Configuration Examples The following example exits IS-IS address family IPv6 configuration mode.

```
Orion_B54Q (config-router-af) #exit-address-family
Orion_B54Q (config-router) #
```

Related Commands	Command	Description
	graceful-restart helper disable	Disables the IS-IS GR Help capability.
	isis hello-interval	Sets the interval of sending Hello packets.
	isis hello-multiplier	Sets the Hello holdtime multiplier for the IS-IS interface.

Platform Description N/A

4.16 graceful-restart

Use this command to enable the IS-IS GR Restart capability. Use the **no** form of this command to disable this capability.

graceful-restart
no graceful-restart

Parameter Description	Parameter	Description
	N/A	N/A

Defaults IS-IS GR is enabled by default.

Command Mode IS-IS routing process configuration mode

Usage Guide With this command used, after the device restart, the IS-IS protocol state is allow to restore to the state before restart without influencing the data forwarding in the condition of network state unchanged.

With the IS-IS GR Restart capability enabled on the device of multiple management boards, the hold time for maintaining the IS-IS adjacent relation shall not be less than 40 seconds to ensure the success of IS-IS graceful restart when the management boards are switched over suddenly. You can configure the hold time using the **isis hello-interval** and **isis hello-multiplier** commands. When the holdtime is less than 40s, the holdtime in the Hello packet header is set to 40 seconds by default.

Note: The IS-IS device needs the help of the GR Helper neighbor device to implement the graceful-restart.

Configuration Examples The following example enables the IS-IS GR Restart capability.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# graceful-restart
```

Related Commands	Command	Description
	graceful-restart helper disable	Disables the IS-IS GR Help capability.
	isis hello-interval	Sets the interval of sending Hello packets.
	isis hello-multiplier	Sets the Hello holdtime multiplier for the IS-IS interface.

Platform N/A
Description

4.17 graceful-restart grace-period

Use this command to configure the maximal interval for the graceful-restart. Use the **no** form of this command to restore the default interval.

graceful-restart grace-period *seconds*
no graceful-restart grace-period

Parameter Description	Parameter	Description
	<i>second</i>	

Defaults The default value is 300 seconds.

Command Mode IS-IS routing process configuration mode

Usage Guide N/A

Configuration The following example sets the interval of the grace-restart to 40 seconds.

n Examples

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# graceful-restart grace-period 40
```

**Related
Commands**

Command	Description
graceful-restart	Enables the IS-IS GR Restart capability.
show isis graceful-restart	Displays the status information of the IS-IS GR Restart.

Platform N/A**Description**

4.18 graceful-restart helper disable

Use this command to disable the IS-IS GR Helper capability. Use the **no** form of this command to enable this capability.

graceful-restart helper disable
no graceful-restart helper disable

**Parameter
Description**

Parameter	Description
N/A	N/A

Defaults IS-IS GR Helper capacity is enabled by default.**Command
Mode** IS-IS routing process configuration mode**Usage Guide** To disable the IS-IS GR Helper capability, execute this command. In this case, the IS-IS will ignore the request of graceful-restarting the device.**Configuratio
n Examples** The following example disables the IS-IS GR Helper capability.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# graceful-restart helper disable
```

**Related
Commands**

Command	Description
graceful-restart	Enables the IS-IS GR Restart capability.

Platform N/A**Description**

4.19 hostname dynamic

Use this command to replace the System ID of the router with the destination router's hostname.

Use the **no** form of this command to cancel this replacement.

hostname dynamic
no hostname dynamic

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, the hostname dynamic function is disabled.

Command Mode IS-IS routing process configuration mode

Usage Guide With this command configured, the hostname of the destination router replaces the System ID. The System IDs shown in the execution of the command such as **show isis database**, **show isis neighbors** are all replaced by the hostname of the destination router.

Configuration Examples
 Orion_B54Q(config) # **router isis**
 Orion_B54Q(config-router) # **hostname dynamic**

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.20 ignore-lsp-errors

Use this command to ignore the LSP checksum errors. Use the **no** form of this command to not ignore the LSP checksum errors.

ignore-lsp-errors
no ignore-lsp-errors

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, the LSP checksum errors are not ignored.

Command Mode IS-IS routing process configuration mode

Usage Guide When the local IS-IS receives a LSP, it will calculate the checksum of LSP received and compare the calculated checksum with that in the LSP packets. By default, if the checksum in the LSP packets is different from the checksum calculated, this LSP will be discarded without processing. If we executes the ignore-lsp-errors command to ignore the checksum errors, the LSP packets with the

incorrect checksum will be processed as the normal packets.

Configuration Examples

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# ignore-lsp-errors
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

4.21 ip router isis

Use this command to enable the IPv4 IS-IS on the specified interface. This command must be configured in the IS-IS configuration. The interface will run on the IS-IS instance named with Tag. If this IS-IS instance is inexistent or this IS-IS instance is not enabled and not initialized, the interface will not enable the IS-IS routing.

Use the **no** form of this command to disable the IPv4 IS-IS routing on the specified interface.

ip router isis [tag]

no ip router isis [tag]

Parameter Description

Parameter	Description
tag	IS-IS instance name.

Defaults

By default, the Ipv4 IS-IS is disabled on the interface.

Command Mode

Interface configuration mode

Usage Guide

Use this command to enable the IS-IS IPv4 routing protocol on the interface. The **no** form of this command disables the IS-IS IPv4 routing.

If the **no ipv4 unicast-routing** is executed in global configuration mode, the IS-IS will disable the IPv4 routing function on all interfaces, namely execute the **no ipv4 router isis** [tag] on all interfaces automatically, while other IS-IS configurations will remain unchanged.

Configuration Examples

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# ip router isis
```

Related Commands

Command	Description
ipv6 router isis	Enables the IPv6 IS-IS on the interface.
router isis	Creates IS-IS instances.

Platform

N/A

Description

4.22 ipv6 router isis

Use this command to enable the IPv6 IS-IS routing on the specified interface. This command must be configured in the IS-IS configuration. The interface will run on the IS-IS instance named with Tag. If this IS-IS instance is inexistent or this IS-IS instance is not enabled and not initialized, the interface will not enable the IS-IS routing.

Use the **no** form of this command to disable the IPv6 IS-IS routing on the specified interface.

ipv6 router isis [tag]

no ipv6 router isis [tag]

Parameter Description	Parameter	Description
	tag	IS-IS instance name

Defaults By default, the Ipv6 IS-IS routing is not supported on the interface.

Command Interface configuration mode

Mode

Usage Guide Configure this command to enable the IS-IS IPv6 routing protocol on the interface. The **no** form of this command disables the IS-IS IPv6 routing.
 If the **no ipv6 unicast-routing** is executed in the global configuration mode, the IS-IS will disable the IPv6 routing function on all interfaces, namely execute the **no ipv6 router isis** [tag] on all interfaces automatically, while other IS-IS configurations will remain unchanged.

Configuration Examples

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# ipv6 router isis
```

Related Commands	Command	Description
	ip router isis	Enables the IPv4 IS-IS on the interface.
	router isis	Creates IS-IS instances.

Platform N/A

Description

4.23 isis authentication key-chain

Use this command to set the key-chain used by the IS-IS interface authentication. Use the **no** form of this command to cancel the specified key-chain.

isis authentication key-chain name-of-chain [level-1 | level-2]

no isis authentication key-chain name-of-chain [level-1 | level-2]

Parameter Description	Parameter	Description
	<i>name-of-chain</i>	Key-chain name with the maximum length being 255.
	level-1	Specifies the authentication key-chain of the Level-1.
	level-2	Specifies the authentication key-chain of the Level-2.

Defaults By default, no IS-IS interface authentication key-chain is specified.

Command Mode Interface configuration mode

Usage Guide If the **key chain** command is not used to configure the corresponding key-chain, the authentication will not be performed. In addition, to make the IS-IS key-chain authentication effective, you need to configure the **isis authentication mode** command at the same time.

This key-chain can apply to the plain-text authentication mode and MD5 encrypted authentication mode. You can use the **isis authentication mode** command to set the authentication mode.

The length of the password key-string in the key-chain shall not be larger than 254 characters if the plain-text authentication mode is used, otherwise this configuration will fail.

Only one key-chain is used at one time. So, when configuring this command, the said key-chain will be overwritten by the new specified one.

If the Level is not specified, the key-chain will apply to both Level-1 and Level-2.

The key-chain specified by this command works on the Hello packets. The IS-IS will send or receive the password that belongs to this key-chain.

There may contain multiple passwords in the key-chain. When sending the packets, use the password with small number first. While receiving the packets, the packet will be received as long as the password of this packet received corresponds to any password in the key-chain.

The authentication commands configured in the IS-IS configuration mode such as authentication key-chain are effective to the LSP, SNP packets, but take no effect on the IS-IS interface.

Configuration Examples The following example specifies the authentication key-chain of the interface GigabitEthernet 0/1 named as *kc*.

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis authentication key-chain kc
```

Related Commands	Command	Description
	isis authentication mode	Specifies the mode of IS-IS interface authentication.
	isis authentication send-only	Specifies the IS-IS interface authentication only applicable to the packets sent, but not to the packets received.
	key-chain	Configures the key-chain.

Platform Description N/A

4.24 isis authentication mode

Use this command to specify the mode of IS-IS interface authentication. Use the **no** form of this command to remove the configuration.

isis authentication mode { md5 | text } [level-1 | level-2]

no isis authentication mode { md5 | text } [level-1 | level-2]

Parameter Description

Parameter	Description
md5	Specifies the MD5 authentication mode.
text	Specifies the plain-text authentication mode.
level-1	Specifies the interface authentication mode to take effect on the Level-1.
level-2	Specifies the interface authentication mode to take effect on the Level-2.

Defaults

By default, no interface authentication mode is specified.

Command Mode

Interface configuration mode

Usage Guide

To make the key-chain configured by the **isis authentication key-chain** command take effect, you must use the **isis authentication mode** command to specify the authentication mode.

If the Level is not specified, the authentication mode specified will apply on both Level-1 and Level-2.

When configuring the **isis authentication mode** command, if the isis password has been executed, the set command will be overwritten by this command.

If the **isis authentication mode** command has been executed, the **isis password** will not be configured successfully. So, you need to delete the **isis authentication mode** command first.

Configuration Examples

The following example specifies the authentication mode on the Level-2 of the interface GigabitEthernet 0/1 to be the MD5 authentication mode.

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis authentication mode md5 level-2
```

Related Commands

Command	Description
isis authentication key-chain	Specifies the key-chain used by the IS-IS interface authentication.
isis authentication send-only	Specifies the IS-IS interface authentication to only apply on the packets sent, but not on the packets received.
key-chain	Configures the key-chain.
isis password	Sets the plain-text authentication password for the packets transmit on the IS-IS interface.

Platform N/A
Description

4.25 isis authentication send-only

Use this command to specify the IS-IS interface authentication to only apply to the packets sent and not to the packets received. Use the **no** form of this command to restore the authentication of packets received on the interface.

isis authentication send-only [level-1 | level-2]

no isis authentication send-only [level-1 | level-2]

Parameter Description	Parameter	Description
	level-1	Set the send-only on the Level-1 of the interface.
	level-2	Set the send-only on the Level-2 of the interface.

Defaults By default, this command is not configured. If the IS-IS interface authentication has been configured, then the authentication will be performed on the packets sent and received at the same time.

Command Mode Interface configuration mode

Usage Guide With this command configured, the IS-IS will set the authentication password in the Hello packets sent from the interface, however, the authentication will not be performed on the Hello packets received. It can apply to the following two occasions: 1. before deploying the IS-IS interface authentication for all devices in the network. 2. before changing the authentication password or authentication mode. Before the above two tasks start, you need to configure the **isis authentication send-only** command first to make each device perform no authentication on the Hello packets received, so as to avoid the network oscillation caused during the subsequent IS-IS interface authentication deployment. After the deployment of the entire network authentication finished, execute the **no isis authentication send-only** command to cancel the **send-only** authentication mode.

This command can apply to the plain-text authentication mode and MD5 authentication mode. You can use the **isis authentication mode** command to set the mode used by the IS-IS interface authentication.

If the Level is not specified, the authentication mode specified is applicable to the Level-1 and Level-2.

Configuration Examples The following example specifies the authentication on the Level-1 of the interface GigabitEthernet 0/1 using send-only authentication mode.

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis authentication send-only level-1
```

Related Commands	Command	Description
------------------	---------	-------------

isis authentication key-chain	Specifies the key-chain used by the IS-IS interface authentication.
isis authentication mode	Specifies the mode of the IS-IS interface authentication.
key-chain	Configures the key-chain.

Platform N/A

Description

4.26 isis circuit-type

Use this command to set the circuit-type for the IS-IS interface. Use the **no** form of this command to restore the default settings.

isis circuit-type { level-1 | level-1-2 | level-2-only }

no isis circuit-type

Parameter Description	Parameter	Description
	level-1	Forms the Level-1 adjacency.
	level-2-only	Forms the Level-2 adjacency.
	level-1-2	Forms the Level-1-2 adjacency.

Defaults By default, the circuit-type is Level-1-2.

Command Interface configuration mode

Mode

Usage Guide If the circuit-type of Level-1 or Level-2-only is configured, then IS-IS will only send PDUs of the same level.

If is-type is configured to Level-1 or Level-2-only, the IS-IS instance will only process data at this level, that is, this Interface will only send the Level PDUs with is-type being same as circuit-type.

Configuration Examples

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis circuit-type level-2-only
```

Related Commands	Command	Description
	isis-type	Sets the Level of IS-IS instance.

Platform N/A

Description

4.27 isis csnp-interval

Use this command to set the interval for broadcasting the CSNP packets on the IS-IS interface, with

the unit being second. Use the **no** form of this command to restore the default interval.

isis csnp-interval *interval* [**level-1** | **level-2**]

no isis csnp-interval [*interval*] [**level-1** | **level-2**]

Parameter Description

Parameter	Description
<i>interval</i>	Interval for sending the CSNP packets in the range of 0 to 65535, with the unit being second.
level-1	Interval for sending the CSNP packets configured only on the Level-1.
level-2	Interval for sending the CSNP packets configured only on the Level-2.

Defaults

By default, in the broadcast network, the interval for sending the CSNP packets is 10 seconds. While in the P2P interface network, no CSNP packet is sent by default.

When using this command without the parameter Level-1 and Level-2, the new setting is defaulted to be applicable to the Level-1 and Level-2 at the time.

Command Mode

Interface configuration mode

Usage Guide

Configure this command to change the interval for sending the CSNP packets. By default, the DIS on the broadcast network sends the CSNP packets every 10 seconds.

For the P2P interface network, by default, the CSNP packets will only be sent at the beginning of adjacency formation. If the interface is set to mesh-groups, you can configure the periodic sending of the CSNP packets.

If the csnp-interval is set to 0, no CSNP packets will be sent.

Configuration Examples

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis csnp-interval 20
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

4.28 isis hello-interval

Use this command to set the interval for sending Hello packets on the interface, with the unit being second. Use the **no** form of this command to restore the default interval.

isis hello-interval { *interval* | **minimal** } [**level-1** | **level-2**]

no isis hello-interval [**level-1** | **level-2**]

Parameter

Parameter	Description
-----------	-------------

Description	<i>interval</i>	Interval for sending the Hello packet, in the range of 1 to 65536.
	minimal	The holdtime is set to the minimal value 1.
	level-1	This interval applies on the Level-1.
	level-2	This interval applies on the Level-2.

Defaults By default, the interval value is 10 seconds, which is applicable to the Level-1 and Level-2 at the same time.
 When using this command without the parameter Level-1 and Level-2, the new setting is defaulted to be applicable to the Level-1 and Level-2 at the time.

Command Mode Interface configuration mode

Usage Guide Configure this command to change the interval for sending Hello packets. By default, the multiplier of the Hello holdtime is 3, and the DIS in broadcast network sends Hello packets at an interval which is three times of non-DIS. If this IS is elected as DIS on this interface, the interface will send Hello packets every 3.3 seconds by default.

If the key word "minimal" is used, then the "holdtime" in Hello packets will be set to 1, and hello interval will be calculated based on the hello-multiplier. For example, if hello-multiplier is configured to 4 and "isis hello-interval minimal" is configured at the same time, the value of hello-interval shall be 1s/4 (250ms).

By default, the CPU protection is enabled on the switch, so that the number of packets corresponding to the destination group addresses of ISIS (AllISSystems, AllL1ISSystems, AllL2ISSystems) is limited when they are sent to the CPU, for example , the default limited value is 400pps. The number of packets received by the switch may be larger than the default value if there are many neighbors or the interval for sending Hello packets is short, resulting in continual vibration of the adjacent relation. In this case, you need to raise the limit of IS-IS packets using the global commands **cpu-protect type isis-is pps**, **cpu-protect type isis-l1is pps** and **cpu-protect type isis-l2is pps**.

Configuration Examples

```

Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis hello-interval 5 level-1
Orion_B54Q(config)# interface GigabitEthernet 0/2
Orion_B54Q(config-if)# isis hello-interval minimal
    
```

Related Commands	Command	Description
	isis hello-multiplier	Sets the multiplier of the Hello hold timer.

Platform Description N/A

4.29 isis hello-multiplier

Use this command to set the multiplier of Hello hold timer. Use the **no** form of this command to restore the default settings.

isis hello-multiplier *multiplier-number* [**level-1** | **level-2**]

no isis hello-multiplier [*multiplier-number*] [**level-1** | **level-2**]

Parameter Description

Parameter	Description
<i>multiplier-number</i>	Multiplier value in the range of 2 to 100.

Defaults By default, the multiplier is 3..

Command Mode IS-IS routing process configuration mode

Usage Guide Use this command to set the multiplier of Hello holdtime. The holdtime value in the Hello packet is the product of hello-interval and this multiplier.

Configuration Examples

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# isis hello-multiplier 5
```

Related Commands

Command	Description
isis hello-interval	Sets the interval for sending the Hello packets.

Platform Description N/A

4.30 isis hello padding

Use this command to specify the filling mode for the IS-IS Hello packets. Use the **no** form of this command to fill no IS-IS Hello packets.

isis hello padding

no isis hello padding

Parameter Description

Parameter	Description
N/A	N/A

Defaults By default, the **isis hello padding** is executed.

Command Mode Interface configuration mode

Usage Guide Fill the IS-IS Hello packets to advertise the MTU supported to the neighbors.

```

Orion_B54Q# configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# no isis hello padding
    
```

Command	Description
isis hello-interval	Sets the interval for sending the Hello packets.

Platform N/A
 Description

4.31 isis lsp-interval

Use this command to set the interval for the LSP PDU transmission. Use the **no** form of this command to restore the default interval.

isis lsp-interval interval
no isis lsp-interval

Parameter	Description
<i>interval</i>	Interval time in the range of 1 to 4294967295, with the unit being millisecond.

Defaults By default, the lsp-interval is 33ms.

Command Mode Interface configuration mode

Usage Guide This command is used to set the minimal interval for sending the LSPs on the interface, with the unit being millisecond.

```

Orion_B54Q#configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis lsp-interval 100
    
```

Command	Description
isis retransmit-interval	Sets the LSP retransmission interval in the P2P network.

Platform N/A
 Description

4.32 isis mesh-group

Use this command to add the interface to the specified mesh-group. Use the **no** form of this command to separate the interface from the mesh-group.

isis mesh-group { **blocked** | *mesh-group-id* }

no isis mesh-group

Parameter Description	Parameter	Description
	blocked	Blocks all LSP forwarding on the interface.
	<i>mesh-group-id</i>	Adds the interface to the mesh-group of specified mesh-group-id with the range being 1 to 4,294,967,295.

Defaults By default, the interface is not added to any mesh-group.

Command Interface configuration mode

Mode

Usage Guide Mesh-groups can control the exceeding and redundant LSP spreading in the NBMA network. In the normal condition, the IS-IS router spreads out the LSP from all interfaces except for the receiving one, that is, if a router is configured multiple subinterfaces, the LSP will be sent from all subinterfaces and the neighbors will receive many same LSPs, which wastes a large number of CPU and bandwidth. The IS-IS mesh-group allows grouping the router interfaces, so if a LSP is received by one subinterface in the group, this LSP will not be spread out through other subinterfaces in the group. And if the router receives the LSP from the interface out of the group, it will spread out the LSP from other interfaces as usual.

If you need to configure the **mesh-group** on the IS-IS interface, use the **isis csnp-interval** command to configure the interval for sending the non-0 CSNP packets, so as to send the CNSP packets regularly to synchronize the LSP and ensure the integrity of LSP synchronization between neighbors in network.

Configuration Examples

```
Orion_B54Q#configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)#isis mesh-group 1
```

Related Commands	Command	Description
	isis network point-to-point	Sets the Broadcast interface type of IS-IS to Point-to-Point.

Platform Description N/A

4.33 isis metric

Use this command to set the metric for the interface. Use the **no** form of this command to restore the default metric.

isis metric *metric* [**level-1** | **level-2**]
no isis metric [*metric*] [**level-1** | **level-2**]

Parameter Description	Parameter	Description
	<i>metric</i>	Metric value in the range of 1 to 63.
	level-1	Sets this metric to apply on the Level-1 circuit.
	level-2	Sets this metric to apply on the Level-2 circuit.

Defaults By default, the metric is 10, which applies on both Level-1 and Level-2 circuit.

Command Mode Interface configuration mode

Usage Guide The Metric value is in the TLV of the IP reachable information and is applied to the SPF calculation. The greater metric value means the more routing cost on this interface and the longer path calculated by SPF. This value is effective only when the metric-style includes narrow.

Configuration Examples

```
Orion_B54Q#configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)#isis metric 1
```

Related Commands	Command	Description
	metric-style	Sets the metric type.
	isis wide-metric	Sets the wide metric of the IS-IS interface.

Platform Description N/A

4.34 isis network point-to-point

Use this command to set the IS-IS Broadcast interface to the Point-to-Point type. Use the **no** form of this command to restore the interface type to the Broadcast.

isis network point-to-point
no isis network point-to-point

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, the **isis network point-point** is not executed.

Command Mode Interface configuration mode

Usage Guide N/A

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis network point-to-point
```

Related Commands	Command	Description
	isis mesh-group	Adds the IS-IS interface into the specified mesh group.

Platform Description N/A

4.35 isis password

Use this command to set the plain-text authentication password for the Hello packet transmitted on the interface. Use the **no** form of this command to remove the configurations.

isis password *password-string* [**send-only**] [**level-1** | **level-2**]
no isis password [**send-only**] [**level-1** | **level-2**]

Parameter Description	Parameter	Description
	password-string	The character strings of the plain-text authentication password with the longest length being 254 characters.
	send-only	The plain-text authentication password is only applicable to the packets sent. No authentication will be performed on the packets received.
	level-1	This password applies to the Level-1 circuit.
	level-2	This password applies to the Level-2 circuit.

Defaults By default, both the passwords on the Level-1 and Level-2 are not configured.

Command Mode Interface configuration mode

Usage Guide This command is used to set the plain-text authentication password for the Hello packets transmitted on the interface. Use the **no** form of this command to clear the passwords. When the Level is not specified, the authentication password configured is by default applicable to every Level. If the **isis authentication mode** command has been executed, this command will not be configured

successfully. To configure this command, you need to delete the **isis authentication mode** command first.

Running the **no isis password send-only** command can only disable the **send-only** option.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis password redgiant
```

Related Commands

Command	Description
isis authentication mode	Specifies the mode of the IS-IS interface authentication.

Platform N/A
Description

4.36 isis priority

Use this command to set the priority for the DIS election on the LAN. Use the **no** form of this command to restore the default priority.

```
isis priority value [ level-1 | level-2 ]
no isis priority [ value ] [ level-1 | level-2 ]
```

Parameter Description

Parameter	Description
value	Value of the priority in the range of 0 to 127.
level-1	Applies to the Level-1 circuit.
level-2	Applies to the Level-2 circuit.

Defaults The default priority value is 4 and it is applied on both Level-1 and Leve-2 circuit.

Command Mode Interface configuration mode

Usage Guide Use this command to change the priority value in the Hello of LAN.
 The low priority value has the lower priority in the DIS election than the high priority value.
 This command takes no effect on the Point-to-Point network interface.
 The **no isis priority** command is used to restore the priority to the default value no matter whether the parameter is followed. If you want to modify the configured priority, you can either use the **isis priority** command with parameter specified to overwrite the configured command directly, or configure a new parameter after restoring the priority to the default value.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# isis priority 127 level-1
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

4.37 isis retransmit-interval

Use this command to set the LSP retransmission interval. Use the **no** form of this command to restore the default interval.

isis retransmit-interval interval-time
no isis retransmit-interval

Parameter Description	Parameter	Description
	<i>interval-time</i>	Interval time in the range of 0 to 65,535 with the unit being second.

Defaults 5s

Command Mode Interface configuration mode

Usage Guide This command is used to set the LSP retransmission interval. The retransmission refers to that on a point-to-point link, if the local router fails to receive the PSNP reply after sending LSPs in the retransmit-interval, it will retransmit that LSP packets.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# interface serial 0/1
Orion_B54Q(config-if)# isis retransmit-interval 10
```

Related Commands	Command	Description
	isis lsp-interval	Configures the interval for LSP advertisement on the interface.

Platform N/A
Description

4.38 isis three-way-handshake disable

Use this command to disable three-way handshake for point-to-point network. Use the **no** form of this command to enable three-way handshake for point-to-point network.

isis three-way-handshake disable
no isis three-way-handshake disable

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, three-way handshake is enabled.

Command Mode Interface configuration mode

Usage Guide In the point-to-point network, three-way handshake is enabled by default. That is to say, the IS-IS neighbor can be established only after three-way handshake is successful. You can use this command to cancel three-way handshake negotiation to accelerate IS-IS neighbor establishment or for the the device not supporting three-way handshake.

Configuration Examples The following example disables three-way handshake on interface GigabitEthernet 0/0.

```
Orion_B54Q(config)#int GigabitEthernet 0/0
Orion_B54Q(config-if)# isis network point-to-point
Orion_B54Q(config-if)# isis three-way-handshake disable
```

Related Commands	Command	Description
	metric-type	Sets the metric type.
	isis metric	Sets the metric value of the interface.

Platform Description N/A

4.39 isis wide-metric

Use this command to set the wide metric of the interface. Use the **no** form of this command to restore the default wide metric.

```
isis wide-metric metric [ level-1 | level-2 ]
no isis wide-metric [ metric ] [ level-1 | level-2 ]
```

Parameter Description	Parameter	Description
	<i>metric</i>	Metric value in the range of 1 to 16,777,241.
	level-1	Sets this Metric to apply on the Level-1 circuit.
	level-2	Sets this Metric to apply on the Level-2 circuit.

Defaults By default, the metric value is 10 and it is applicable to both Level-1, Level-2 circuit.

Command Mode Interface configuration mode

Usage Guide The Metric value is in the TLV of the IP reachable information and is applied to the SPF calculation.

The greater metric value means the more routing cost on this interface and the longer path calculated by SPF.

This value is effective only when the metric-style includes wide.

Configuration Examples

```
Orion_B54Q#configure terminal
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)#isis wide-metric 1000
```

Related Commands

Command	Description
metric-type	Sets the metric type.
isis metric	Sets the metric value of the interface.

Platform N/A
Description

4.40 is-type

Use this command to specify the level for the IS-IS process. Use the **no** form of this command to restore the default level for IS-IS process.

is-type { level-1 | level-1-2 | level-2-only }
no is-type

Parameter Description

Parameter	Description
level-1	Specifies the IS-IS process running on the Level-1 only.
level-1-2	Specifies the IS-IS process running on both Level-1 and Level-2.
level-2-only	Specifies the IS-IS process running on the Level-2 only.

Defaults By default, the IS-IS process runs on Level-1-2.

Command Mode IS-IS routing process configuration mode

Usage Guide Changing the is-type enables or disables the route of one Level.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# is-type level-1
```

Related Commands

Command	Description
isis circuit-type	Sets the type of Interface circuit.

Platform N/A
Description

4.41 log-adjacency-changes

Use this command to log the changes of the IS adjacency status in case of debug disabled. Use the **no** form of this command to disable this function.

log-adjacency-changes
no log-adjacency-changes

Parameter Description	Parameter	Description
	N/A	N/A

Defaults By default, this function is enabled.

Command Mode IS-IS routing process configuration mode

Usage Guide You can also use the **debug** command to log the changes of the IS adjacency status. But using the IS-IS debug command will exhaust large numbers of resources.

Configuration Examples

```
Orion_B54Q(config-router)# log-adjacency-changes
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.42 lsp-fragments-extend

Use this command to enable the LSP fragment extension mode for a level. Use the **no** form of this command to disable the LSP fragment extension mode for a level.

lsp-fragments-extend [level-1 | level-2] [compatible rfc3786]
no lsp-fragments-extend [level-1 | level-2] [compatible rfc3786]

Parameter Description	Parameter	Description
	level-1	Enables the LSP fragment extension mode for the Level-1 only.
	level-2	Enables the LSP fragment extension mode for the Level-2 only.
	compatible	Compatible with RFC3786
	rfc3786	The older version of extended LSP implementation.

Defaults By default, LSP fragment extension is disabled.
 If no level is specified, the LSP fragment extension mode is enabled for both Level-1 and Level-2.

Command IS-IS routing process configuration mode

Mode

Usage Guide The originating LSP can be divided up to 256 fragments. After the 256 fragments are filled, the subsequent link state information, such as the neighbor and IP routing, will be discarded, resulting in network problem.

To avoid the above problem, you can enable the LSP fragment extension function, and configure the additional system ID using the **virtual-system** command.

If there are other vendor's device supporting RFC3786 standard in the network, you need to display the link state database of the device when enabling or disabling the **compatible** option. If there is indeed the vendor's device, you can use the **clear isis *** command to clear the remaining LSP packets to trigger the system to update the link state database.

Configuration Examples The following example enables the LSP fragment extension mode for the Level-2.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# lsp-fragments-extend level-2
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

4.43 lsp-gen-interval

Use this command to set the minimal interval of the LSP generation. Use the **no** form of this command to restore the default value.

lsp-gen-interval [level-1 | level-2] value

no lsp-gen-interval

Parameter Description	Parameter	Description
	<i>value</i>	In the range of 1 to 20 with unit being second.
	level-1	The minimal interval is applicable on the Level-1 IS-IS.
	level-2	The minimal interval is applicable on the Level-2 IS-IS.

Defaults By default, this command is not configured and the interval of the minimal generation is 5s, it is effective on both Level-1 an Level-2

Command IS-IS routing process configuration mode

Mode

Usage Guide The LSP generation interval refers to the interval of the generation time between the new version LSP and old LSP. The smaller this value, the faster the network convergence is, but it also causes the frequent network flood. This value must be set properly according to different environments

```

Configuration Examples
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# lsp-gen-interval 5
    
```

Related Commands	Command	Description
		lsp-refresh-interval

Platform N/A
Description

4.44 lsp-refresh-interval

Use this command to set the LSP refresh interval. Use the **no** form of this command to restore the default value.

lsp-refresh-interval *interval*
no lsp-refresh-interval

Parameter Description	Parameter	Description
		<i>interval</i>

Defaults By default, the lsp-refresh-interval is 900 seconds.

Command Mode IS-IS routing process configuration mode

Usage Guide if the LSP stable status lasts for the time of refresh interval, LSP will refresh this LSP and update the LSP version and publish it.
 It should be noted that the lsp-refresh-interval must be less than the max lifetime.

```

Configuration Examples
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# lsp-refresh-interval 600
    
```

Related Commands	Command	Description
		N/A

Platform N/A
Description

4.45 max-area-addresses

Use this command to set the maximal number of area address allowed. Use the **no** form of this command to restore the default value.

max-area-addresses *value*

no max-area-addresses

Parameter Description

Parameter	Description
<i>value</i>	The maximal number of area address allowed, in the range of 3 to 6.

Defaults

By default, the max-area-addresses is 3.

Command Mode

IS-IS routing process configuration mode

Usage Guide

For the IS routers of Level-1, only the ones with the same max-area-addresses are allowed to establish the adjacency relation.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# max-area-addresses 5
```

Related Commands

Command	Description
net	Sets the IS-IS NET(Network Entry Title) address.

Platform

N/A

Description

4.46 max-lsp-lifetime

Use this command to set the maximum value of the LSP lifetime. Use the **no** form of this command to restore the default value.

max-lsp-lifetime *value*

no max-lsp-lifetime

Parameter Description

Parameter	Description
<i>value</i>	Maximum value of the LSP lifetime in the range of 1 to 65,535, with unit being second.

Defaults

By default, the max-lsp-lifetime is 1200 seconds.

Command

IS-IS routing process configuration mode

Mode

Usage Guide It should be noted that the max-lsp-lifetime must be greater the lsp-refresh-interval.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# max-lsp-lifetime 1500
```

Related Commands

Command	Description
lsp-refresh-interval	Configures the interval for LSP refresh.

Platform N/A

Description

4.47 metric-style

Use this command to set the metric style. Use the **no** form of this command to restore the default metric style.

metric-style { narrow [transition] | wide [transition] | transition } [level-1 | level-1-2 | level-2 |]
no metric-style { narrow [transition] | wide [transition] | transition } [level-1 | level-1-2 | level-2 |]

Parameter Description

Parameter	Description
narrow	Uses the old metric style with the router interface metric ranging from 1 to 63.
wide	Uses the new metric style with the router interface metric ranging from 1 to 16777214
transition	Allows the router to send and receive the new and old metric style.
level-1	This metric-style on the Level-1 circuit.
level-2	This metric-style applies on the Level-2 circuit.
level-1-2	This metric-style applies on the Level-1-2 circuit.

Defaults By default, the metric-style is narrow.

Command Mode IS-IS routing process configuration mode

Usage Guide The metric value of the interface is specified by the **isis metric** *metric* when the metric-style is set to narrow, while the metric value is specified by the **isis wide-metric** *metric* in case that the metric-style is set to wide or **transition**.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# metric-style wide
```

Related Commands

Command	Description
isis metric	Sets the metric of the interface.
isis wide-metric	Sets the wide metric of the interface.

Platform

N/A

Description

4.48 net

Use this command to set the IS-IS NET (Network Entry Title) address. Use the **no** form of this command to delete this NET address.

net *net-address*

no net *net-address*

Parameter Description

Parameter	Description
<i>net-address</i>	The format of net-address is shown as below: XX..XXXX.YYYY.YYYY.YYYY.00, the XX...XXXX is the area address and the YYYY.YYYY.YYYY is the system ID.

Defaults

By default, no NET address is set.

Command Mode

IS-IS routing process configuration mode

Usage Guide

This command is used to set the Area ID and System ID for the IS-IS. Up to three NET addresses are allowed to be set by default, namely three addresses with different Area can be set. However, the System ID must be the same.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# net 49.0000.0001.0002.0003.00
```

Related Commands

Command	Description
router isis	Creates IS-IS instances.

Platform

N/A

Description

4.49 passive-interface

Use this command to configure the passive interface. Use the **no** form of this command to remove

the passive interface.

passive-interface [**default**] { *interface-type interface-number* }

no passive-interface [**default**] { *interface-type interface-number* }

Parameter Description

Parameter	Description
default	Configures IS-IS disabled interfaces as passive.
<i>interface-type</i>	Indicates the interface type.
<i>interface-number</i>	Indicates the interface number.

Defaults The passive interface is not configured by default.

Command Mode IS-IS routing process configuration mode

Usage Guide Use this command to disable the interface to receive and send the IS-IS packets, but to advertise the IP address of the interface.

After the **default** option is configured, if the number of IS-IS disabled interfaces exceeds 255, the first 255 interfaces are configured as passive and the remaining interfaces are non-passive.

Configuration Examples The following example configures interface GigabitEthernet 0/0 as passive.

```
Orion_B54Q(config)# router isis 1
Orion_B54Q(config-router)# passive-interface GigabitEthernet 0/0
```

Related Commands

Command	Description
router isis	Creates IS-IS instances.

Platform N/A

Description

4.50 redistribute

Use this command to redistribute the routes from one routing protocol into another routing protocol.

Use the **no** form of this command to delete the redistribution.

redistribute { **bgp** | **ospf** *process-id* **match** { **internal** | **external** [**1** | **2**] | **nssa-external** [**1** | **2**] } | **rip** | **connected** | **static** } [**metric** *metric-value*] [**metric-type** *type-value*] [**route-map** *map-tag*] [**level-1** | **level-1-2** | **level-2**]

no redistribute { **bgp** | **ospf** *process-id* [**match** { **internal** | **external** [**1** | **2**] | **nssa-external** [**1** | **2**] }] | **rip** | **connected** | **static** } [**metric** *metric-value*] [**metric-type** { **internal** | **external** }] [**route-map** *map-tag*] [**level-1** | **level-1-2** | **level-2**]

Parameter Description

Parameter	Description
<i>process-id</i>	OSPF process ID, in the range of 1 to 65535.

match { internal external [1 2] nssa-external [1 2] }	Redistributes the OSPF routes to perform the filtering on the subtype of the OSPF routes. If the match option is not specified, all routes of the ospf subtype by default are received. If the 1 or 2 followed by the match external is not specified, then redistribute the route of the OSPF external1 and external 2 . if the 1 or 2 following the match nssa-external is not specified, then redistribute the routes of OSPF nssa-external 1 and nssa-external 2 .
metric <i>metric-value</i>	Sets the metric value of redistributing the route, in the range of 0 to 4261412864. If the metric option is not specified, the external metric value is used.
metric-type { internal external }	Sets the metric type of redistributing the route. internal : use the internal metric type. external : use the external metric type. If the metric-type is not specified, the internal type is used by default.
route-map <i>map-tag</i>	Sets the route-map during the external routes redistribution, which is used to filter the redistributed routes or set attributions of the routes. The name of <i>map-tag</i> shall not be over 32 characters. No route-map is configured by default.
level-1 level-1-2 level-2	Specifies the Level of receiving the redistributed routing information. If the Level is not specified, it is defaulted to be redistributed into the Level-2 . The format is shown as below: level-1 : redistribute into the Level-1 level-1-2 : redistribute into both Level-1 and Level-2. level-2 : redistribute into the Level-2.

Defaults By default, no redistribution is configured.

Command IS-IS routing process configuration mode , IS-IS address-family ipv6 mode

Mode

Usage Guide Configure "**no redistribue** { **bgp** | **ospf processs-id** | **rip** | **connected** | **static** }" to disable protocol redistribution. If "**no redistribute**" is followed by any other parameter, it means that this parameter is restored to the default setting instead of disabling protocol redistribution. For example: "**no redistribute bgp**" will disable bgp redistribution, while "**no redistribute bgp route-map aa**" will disable route-map aa filtering during redistribution instead of disabling bgp redistribution.
The routing information will be placed into the IP External Reachability Information TLV of LSP when redistributing external route in the IPv4 mode.
The routing information will be placed to the IPv6 Reachable TLV of LSP when redistributing external route in the IPv6 mode.
In the old version of some vendors, after configuring the **metric-type** to the **external**, the redistributed route metric will be added by 64 and then perform the routing according to the metric value during the routing calculation, which violates the protocol. In actual application, the priority of

the external route may be higher than that of the internal route. When connecting with these old version of some vendors, the related configuration (such as the **metric** or the **metric-type**) of each device can be modified to ensure that the priority of the internal route is higher than the external.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# redistribute ospf 1 metric 10 level-1
```

Related Commands

Command	Description
redistribute isis [tag] level-2 into level-1	Redistributes the reachable routing information from Level-2 into Level-1.
redistribute isis [tag] level-1 into level-2	Redistributes the reachable routing information from Level-1 into Level-2.
route-map	Configures the route map.

Platform Description N/A

4.51 redistribute isis level-2 into level-1

Use this command to redistribute the Level-2 reachable routing information of the IS-IS instance into the Level-1 of current instance. Use the **no** form of this command to remove the redistribution.

redistribute isis [tag] level-2 into level-1 [route-map route-map-name | distribute-list access-list-name]

no redistribute isis [tag] level-2 into level-1 [route-map route-map-name | distribute-list access-list-name]

Parameter Description

Parameter	Description
<i>tag</i>	Name of the IS-IS instance to be redistributed.
route-map route-map-name	Sets the route map during the route redistribution, which is used to filter the redistributed routes and set attributions of the routes. Name of the <i>route-map-name</i> shall not be over 32 characters. <ul style="list-style-type: none"> No route-map is configured by default.
distribute-list access-list-name	<ul style="list-style-type: none"> Uses the distribute-list to filter the redistributed routes. Access-list-name is the prefix list associated, it can be the standard, extended or naming prefix list. The format is shown as below: {<1-99> <100-199> <1300-1999> <2000-2699> <i>acl-name</i> } <ul style="list-style-type: none"> In the IS-IS address-family ipv6 mode, you can use only the naming prefix list with the format being <i>acl-name</i>.

Defaults N/A

Command IS-IS routing process configuration mode or IS-IS **address-family ipv6** mode.

Mode

Usage Guide Use the **route-map** or **distribute-list** to filter the Level-2 route of the specified instance to be redistributed. Only the route that meets the condition can be redistributed into the Level-1 of current instance.

 You can only choose one of the two parameters **route-map** and **distribute-list**.

Configure the **no distribute isis [tag] level-2 into level-1** to disable the specified instance redistribution. If the **no redistribute** is followed by any other parameters, it means that this parameter is restored to the default setting instead of disabling the specified instance redistribution. For example: "**no redistribute isis tag1 level-2 into level-1**" will disable the isis *tag1* redistribution, while "**no redistribue isis tag1 level-2 into level-1 route-map a**" will disable route-map *a* filtering during redistribution instead of disabling the isis *tag1* redistribution.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis aa
Orion_B54Q(config-router)# redistribute isis bb level-2 into level-1
```

Related Commands

Command	Description
redistribute	Redistributes the routing information from another routing protocol.
redistribute isis level-1 into level-2	Redistributes the reachable routing information from Level-1 into Level-2.

Platform Description N/A

4.52 redistribute isis level-1 into level-2

Use this command to redistribute the Level-1 reachable routing information of the IS-IS instance into the Level-2 of current instance. Use the **no** form of this command to disable this redistribution.

redistribute isis [tag] level-1 into level-2 [route-map route-map-name | distribute-list access-list-name]

no redistribute isis [tag] level-1 into level-2 [route-map route-map-name | distribute-list access-list-name]

Parameter Description


Parameter	Description
<i>tag</i>	Name of the IS-IS instance.
route-map route-map-name	Sets the route map during the route redistribution, which is used to filter the redistributed route and set attributions of this route. Name of the <i>route-map-name</i> shall not be over 32 characters.

	No route-map is configured by default.
distribute-list <i>access-list-name</i>	Uses the distribute-list to filter the redistributed routes. Access-list-name is the prefix list associated, it can be the standard, extended or naming prefix list. The format is shown as below: {<1-99> <100-199> <1300-1999> <2000-2699> <i>acl-name</i> } In the IS-IS address-family ipv6 mode, you can use only the naming prefix list with the format being <i>acl-name</i> .

Defaults If the IS-IS Level-2 instance exists, all IS-IS Level-1 routes are by default redistributed into the IS-IS Level-2 instace.

Command Mode IS-IS routing process configuration mode or IS-IS **address-family ipv6** mode.

Usage Guide Use the **route-map** or **distribute-list** to filter the Level-1 route of the specified instance to be redistributed. Only the route that meets the condition can be redistributed into the Level-1 of current instance.

 You can only choose one of the two parameters **route-map** and **distribute-list**.

Configure the **no distribute isis [tag] level-2 into level-1** to disable the specified instance redistribution. If the **no redistribute** is followed by any other parameters, it means that this parameter is restored to the default setting instead of disabling the specified instance redistribution. For example: "**no redistribute isis tag1 level-1 into level-2**" will disable the isis tag1 redistribution, while "**no redistribtue isis tag1 level-1 into level-2 route-map aa**" will disable route-map aa filtering during redistribution instead of disabling the isis tag1 redistribution.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis aa
Orion_B54Q(config-router)# redistribute isis bb level-1 into level-2
```

Related Commands	Command	Description
	redistribute	Redistributes the routing information from another routing protocol.
redistribute isis level-2 into level-1	Redistributes the reachable routing information from Level-2 into Level-1.	

Platform N/A
Description

4.53 router isis

Use this command to create the IS-IS instance. Use the **no** form of this command to delete this instance.

router isis [tag]

no router isis [tag]

Parameter Description	Parameter	Description
	<i>tag</i>	Instance name

Defaults By default, no IS-IS instance is configured.

Command Global configuration mode

Mode

Usage Guide Use this command to initialize the IS-IS instance and enter the IS-IS routing process configuration mode.

The IS-IS instance will not be executed unless one NET address is configured at least.

When enabling the IS-IS routing process with the parameter *tag*, the parameter *tag* will be used as well when disabling the IS-IS routing process.

By default, the CPU protection is enabled on the switch, so that the number of packets corresponding to the destination group addresses of ISIS (AllISSystems, AllL1ISSystems, AllL2ISSystems) is limited when they are sent to the CPU, for example, the default limited value is 400pps. The number of packets received by the switch may be larger than the default value if there are many neighbors or the interval for sending Hello packets is short, resulting in continual vibration of the adjacent relation. In this case, you need to raise the limit of IS-IS packets using the global commands **cpu-protect type isis-is pps**, **cpu-protect type isis-l1is pps** and **cpu-protect type isis-l2is pps**.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
```

Related Commands	Command	Description
	ip router isis	Enables the IS-IS IPv4 routing protocol on the interface.
	ipv6 router isis	Enables the IS-IS IPv6 routing protocol on the interface.
	net	Sets the NET address.

Platform N/A

Description

4.54 spf-interval

Use this command to set the minimal interval for the SPF calculation. Use the **no** form of this command to restore the default minimal interval.

spf-interval [level-1 | level-2] interval

no spf-interval

Parameter Description	Parameter	Description
	<i>interval</i>	The minimal interval for the SPF calculation in the range of 1 to 120, with unit being second.

Defaults By default, this command is not configured.
The default SPF interval is 10 seconds, which takes effect on both Level-1 and Level-2.

Command Mode IS-IS routing process configuration mode

Usage Guide To avoid wasting the CPU resource due to the frequent SPF calculation, set and increase the SPF minimal interval. However, increasing the interval also causes the response to the routing change delayed.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# spf-interval level-1 20
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.55 summary-address

Use this command to configure the IPv4 aggregation route. Use the **no** form of this command to delete the aggregation route.

summary-address *address/prefix* [**level-1** | **level-2** | **level-1-2**]
no summary-address *address/prefix*

Parameter Description	Parameter	Description
	<i>address / prefix</i>	Aggregation network address and the IP prefix length of the aggregation network address, in the format of A.B.C.D/<0-32>
	level-1	Applies to the Level-1 only.
	level-1	Applies to the Level-2 only.
	level-1-2	Applies to both Level-1 and Level-2.

Defaults By default, no aggregation route is configured.
If the Level is not specified, it is defaulted to take effect on the Level-2.

Command Mode IS-IS routing process configuration mode

Usage Guide With the aggregation route configured, if there is any reachable address or reachable network segment route in the aggregation route, it will publish the aggregation route instead of the detailed route.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# summary-address 10.10.0.0/24 level-1-2
```

Related Commands

Command	Description
summary-prefix	Configures the IPv6 aggregation route.

Platform N/A
Description

4.56 summary-prefix

Use this command to configure the IPv6 aggregation route. Use the **no** form of this command to delete the aggregation route.

summary-prefix *ipv6-prefix/prefix-length* [**level-1** | **level-2** | **level-1-2**]

no summary-address *ipv6-prefix/prefix-length* [**level-1** | **level-2** | **level-1-2**]

Parameter Description

Parameter	Description
<i>ipv6-prefix / prefix-length</i>	Aggregation network address and the IP prefix length of the aggregation network address.
level-1	Applies to the Level-1 only.
level-2	Applies to the Level-2 only.
level-1-2	Applies to both Level-1 and Level-2.

Defaults By default, no aggregation route is configured.
 If the Level is not specified, it is defaulted to take effect on the Level-2.

Command Mode Address-family ipv6 mode

Usage Guide With the aggregation route configured, if there is any reachable address or reachable network segment route in the aggregation route, it will publish the aggregation route instead of the detailed route.

Configuration Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# address-family ipv6
Orion_B54Q (config-router-af)# summary-prefix 1000::/96 level-1-2
```

Related Commands	Command	Description
	summary-address	Configures the IPv4 aggregation route.

Platform N/A
Description

4.57 virtual-system

Use this command to configure an additional system ID for fragment extension. Use the **no** form of this command to remove the additional system ID.

virtual-system *system-id*
no virtual-system *system-id*

Parameter Description	Parameter	Description
	<i>system-id</i>	Additional system ID. The length is 6 bytes.

Defaults No additional system ID is configured by default.

Command Mode IS-IS routing process configuration mode

Usage Guide Use this command to configure an additional system ID for LSP fragment extension. The system must be enabled with fragment extension mode and configured with the additional system ID to enable LSP fragment extension.

Configuration Examples The following example configures an additional system ID for fragment extension.

```
Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# virtual-system 0000.0000.0034
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

4.58 vrf

Use this command to bind the ISIS process with a VRF instance. Use the **no** form of this command to unbind the IS-IS process from the VRF instance.

vrf *vrf-name*
no vrf *vrf-name*

Parameter	Parameter	Description
------------------	-----------	-------------

Description		
	<i>vrf-name</i>	VRF instance name. The VRF instance must be configured.

Defaults No IS-IS process is bound with the VRF instance.

Command IS-IS routing process configuration mode

Mode

Usage Guide Before you configure this command, the specified VRF instance must be configured. If you want to build the IS-IS v6 neighbor, the multi-protocol VRF and IPv6 protocol must be enabled.

The following restrictions are for binding IS-IS process with VRF instance:

1. The IS-IS process in the same non-default VRF instance must be configured with a different system ID. The IS-IS process in the different VRF instance can be configured with the same system ID.
2. An IS-IS process can be bound with only one VRF instance. A VRF instance can be bound with multiple IS-IS processes.
3. If a VRF instance bound with an IS-IS changes, the IS-IS enabled interfaces which are bound with the VRF instance and the redistribute configuration in IS-IS routing process configuration mode will be removed.

Configuration Examples The following example binds an IS-IS process with a VRF instance.

```
Orion_B54Q(config)#vrf definition vrf_1
Orion_B54Q(config-vrf)#address-family ipv4
Orion_B54Q(config-vrf-af)#exit-address-family

Orion_B54Q(config)# router isis
Orion_B54Q(config-router)# vrf vrf_1
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

4.59 show clns is-neighbor

Use this command to display all IS neighbors to provide the adjacency relationship of routers.

show clns [tag] is-neighbors [IFNAME | detail]

Parameter Description	Parameter	Description
	<i>tag</i>	Specifies the IS-IS instance.
	<i>IFNAME</i>	Specifies the name of interface.
	detail	Displays detailed information of all interfaces.

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The output results of the **show clns is-neighbors detail** command are displayed as below:

```
Area (null):
System Id   Type   IP Address   State   Holdtime   Circuit   Interface
r1          L1     1.0.0.2     Up      9          r1.01     VLAN 1
L2         1.0.0.2   Up      9          r1.01     VLAN 1

Adjacency ID: 1
Uptime: 00:00:54
Area Address(es): 49.1111
IP Address(es): 1.0.0.2
Level-1 Protocols Supported: IPv4
Level-2 Protocols Supported: IPv4
```

Related Commands

Command	Description
show clns neighbors	Displays all IS neighbors to provide the router information and the adjacency relationship of terminal system.

Platform N/A

Description

4.60 show clns neighbors

Use this command to display all IS neighbors to provide the router information and the adjacency relationship of terminal system.

show clns [tag] neighbors [IFNAME | detail]

Parameter Description

Parameter	Description
<i>tag</i>	Specifies the IS-IS instance.
<i>IFNAME</i>	Specifies the name of the interface.
detail	Displays detailed information of all interfaces.

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The output results of the **show clns neighbors detail** command are displayed as below:

```
Area (null):
System Id          SNPA                State Holdtime  Type Protocol
Interface
r1                 00d0.f822.33ad     Up    7          L1    IS-IS
VLAN 1
Up    7             L2    IS-IS
VLAN 1
Adjacency ID: 1
Uptime: 00:02:47
Area Address(es) : 49.1111
```

Related Commands

Command	Description
show clns is-neighbors	Displays all IS neighbors to provide the router adjacency relationship.

Platform Description N/A

4.61 show isis counter

Use this command to display various statistics of IS-IS.

show isis [tag] counter

Parameter Description

Parameter	Description
<i>tag</i>	Specifies the IS-IS instance.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The output results of the **show clns neighbors details** are displayed as below:

```
Orion_B54Q# show isis counter
Area (null):
IS-IS Level-1 isisSystemCounterEntry:
isisSysStatCorrLSPs: 0
isisSysStatAuthTypeFails: 0
isisSysStatAuthFails: 0
isisSysStatLSPDbaseOloads: 0
```

```
isisSysStatManAddrDropFromAreas: 0
isisSysStatAttmptToExMaxSeqNums: 0
isisSysStatSeqNumSkips: 0
isisSysStatOwnLSPPurges: 0
isisSysStatIDFieldLenMismatches: 0
isisSysStatMaxAreaAddrMismatches: 0
isisSysStatPartChanges: 0
isisSysStatSPFRuns: 30
IS-IS Level-2 isisSystemCounterEntry:
isisSysStatCorrLSPs: 0
isisSysStatAuthTypeFails: 0
isisSysStatAuthFails: 0
isisSysStatLSPDbaseOloads: 0
isisSysStatManAddrDropFromAreas: 0
isisSysStatAttmptToExMaxSeqNums: 0
isisSysStatSeqNumSkips: 0
isisSysStatOwnLSPPurges: 0
isisSysStatIDFieldLenMismatches: 0
isisSysStatMaxAreaAddrMismatches: 0
isisSysStatPartChanges: 0
isisSysStatSPFRuns: 30
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

4.62 show isis database

Use this command to display the LSP database.

show isis [*tag*] **database** [*FLAGS* | *LEVEL* | *LSPID*]

Parameter Description

Parameter	Description
<i>tag</i>	Specifies the IS-IS instance.
<i>FLAGS</i>	The format is displayed as below: detail verbose detail: detailed information Verbose: more detailed information than the detail.
<i>LEVEL</i>	The format is displayed as below: l1 l2 level-1 level-2

	I1 and level-1: specify the LSP database of the Level-1. I2 and level-2: specify the LSP database of the Level-2
<i>LSPID</i>	Specifies the ID number of LSP to show the corresponding LSP information only.

Defaults N/A

Command Privileged EXEC mode/ global configuration mode

Mode

Usage Guide N/A

Configuration Examples The output results of the **show isis database detail** command are displayed as below:

```

Orion_B54Q# show isis database detail
Area (null):
IS-IS Level-1 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
Orion_B54Q.00-00 * 0x00000007  0xCDD5        1011          0/0/0
  Area Address: 49.1111
  NLPID:        0xCC
  Hostname:     Orion_B54Q
  IP Address:   1.0.0.1
  Metric: 10    IS r1.01
  Metric: 10    IP 1.0.0.0 255.255.255.0
r1.00-00       0x00000006  0xA771        1032          0/0/0
  Area Address: 49.1111
  NLPID:        0xCC
  Hostname:     r1
  IP Address:   1.0.0.2
  Metric: 10    IS r1.01
  Metric: 10    IP 1.0.0.0 255.255.255.0
r1.01-00       0x00000002  0x062A        989           0/0/0
  Metric: 0     IS r1.00
  Metric: 0     IS Orion_B54Q.00

IS-IS Level-2 Link State Database:
LSPID          LSP Seq Num  LSP Checksum  LSP Holdtime  ATT/P/OL
Orion_B54Q.00-00 * 0x0000000A  0xC7D8        1033          0/0/0
  Area Address: 49.1111
  NLPID:        0xCC
  Hostname:     Orion_B54Q
  IP Address:   1.0.0.1
  Metric: 10    IS r1.01
  Metric: 10    IP 1.0.0.0 255.255.255.0
r1.00-00       0x00000006  0xA771        1032          0/0/0
  
```



```

Area Address: 49.1111
NLPID:      0xCC
Hostname:   r1
IP Address: 1.0.0.2
Metric:    10          IS r1.01
Metric:    10          IP 1.0.0.0 255.255.255.0
r1.01-00   0x00000002  0x062A          989          0/0/0
Metric:    0          IS r1.00
Metric:    0          IS Orion_B54Q.00
    
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

4.63 show isis graceful-restart

Use this command to display the status information related to the IS-IS GR.

show isis [tag] graceful-restart

Parameter Description

Parameter	Description
<i>tag</i>	IS-IS instance name

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the GR information of the IS-IS default instance in the global configuration mode.

```

Orion_B54Q(config)# show isis graceful-restart
Graceful-restart: enabled, graceful-period: 60s, Level timer: 60,
Interface timer: 3s.
Graceful-restart Helper: enabled.
    
```

Related Commands

Command	Description
graceful-restart	Enables the IS-IS GR Restart capability.
graceful-restart grace-period	Configures the maximum interval of the graceful-restart.

graceful-restart helper disable	Disables the IS-IS GR Help capability.
graceful-restart	Enables the IS-IS GR Restart capability.

Platform N/A
Description

4.64 show isis hostname

Use this command to display the mapping relation between the router name and system ID.

show isis [tag] hostname

Parameter Description	Parameter	Description
	<i>tag</i>	Specifies the IS-IS instance.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The output results of the **show isis hostname** command are shown as below:

```
Orion_B54Q# show isis hostname
System ID      Dynamic Hostname
5555.5555.5555 Orion_B54Q
1111.1111.1111 r1
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

4.65 show isis interface

Use this command to display the information about IS-IS interface.

show isis [tag] interface [IFNAME]

Parameter Description	Parameter	Description
	<i>tag</i>	Specifies the IS-IS instance name.
	IFNAME	Specifies the Interface name.

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The following example displays the IS-IS interface.

```
Orion_B54Q# show isis interface
Area (null):
VLAN 1 is up, line protocol is up
  Routing Protocol: IS-IS ((null))
    Network Type: Broadcast
    Circuit Type: level-1-2
    Local circuit ID: 0x01
    Extended Local circuit ID: 0x00000001
    Local SNPA: 00d0.f822.33ab
    IP interface address:
      1.0.0.1/24
    Level-1 Metric: 10/10, Priority: 64, Circuit ID: r1.01
    Number of active level-1 adjacencies: 1
    Level-2 Metric: 10/10, Priority: 64, Circuit ID: r1.01
    Number of active level-2 adjacencies: 1
    Next IS-IS LAN Level-1 Hello in 5 seconds
    Next IS-IS LAN Level-2 Hello in 5 seconds
    BFD Enabled (Anti-congestion)
    Eligible to backup traffic
    FRR Protect Enabled (Link)
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

4.66 show isis mesh-groups

Use this command to display the mesh-group configurations on each interface.

show isis [tag] mesh-groups

Parameter Description

Parameter	Description
<i>tag</i>	Specifies the IS-IS instance.

Defaults N/A

Command Privileged EXEC mode

Mode

N/A

Usage Guide

Configuration Examples The following example displays the mesh groups.

```
Orion_B54Q# show isis mesh-groups
Mesh group (blocked)
FastEthernet 1/1
Mesh group 1 :
FastEthernet 1/0
```

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

4.67 show isis neighbors

Use this command to display the IS-IS neighbors..

show isis [tag] neighbors [detail]

Parameter Description

Parameter	Description
<i>tag</i>	Displays the IS-IS instance.
detail	Displays the detailed information of all interfaces.

Defaults

N/A

Command

Privileged EXEC mode

Mode

Usage Guide

N/A

Configuration Examples The following example displays details of IS-IS neighbors.

```
Orion_B54Q# show isis neighbors detail
Area (null):
System Id  Type  IP Address  State  Holdtime  Circuit  Interface
r1         L1   1.0.0.2    Up     9         r1.01   VLAN 1
L2        1.0.0.2  Up     9         r1.01   VLAN 1
Adjacency ID: 1
Uptime: 00:06:25
Area Address(es) : 49.1111
```

```
IP Address(es) : 1.0.0.2
Level-1 Protocols Supported: IPv4
Level-2 Protocols Supported: IPv4
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

4.68 show isis topology

Use this command to display the topology of the IS-IS router connection.

show isis [tag] topology [I1 | I2 | level-1 | level-2]

Parameter Description

Parameter	Description
<i>tag</i>	Specifies the IS-IS instance.
I1	Specifies the topology of Level-1.
level-1	Specifies the topology of Level-1.
I2	Specifies the topology of Level-2.
level-2	Specifies the topology of Level-2.

Defaults N/A

Command Mode Privileged EXEC mode/ global configuration mode/ interface configuration mode

Usage Guide N/A

Configuration Examples The following example displays all IS-IS neighbors:

```
Orion_B54Q#show isis topology
Area (null):
IS-IS paths to level-1 routers
System Id    Metric  Next-Hop  SNPA          Interface
r1           10     r1        00d0.f822.33ad GigabitEthernet 0/0
Orion_B54Q   --
IS-IS paths to level-2 routers
System Id    Metric  Next-Hop  SNPA          Interface
r1           10     r1        00d0.f822.33ad GigabitEthernet 0/0
Orion_B54Q   --
```

**Related
Commands**

Command	Description
N/A	N/A

**Platform
Description**

N/A

5 BGP4 Commands

5.1 address-family ipv4

Use this command to enter IPv4 address family configuration mode to configure BGP configuration mode. Use the **no** form of this command to exit BGP address configuration mode.

address-family ipv4 [unicast]

no address-family ipv4 [unicast]

Parameter	Parameter	Description
Description	unicast	Optional, detailed IPv4 unicast address prefix

Defaults The configuration mode is unicast address prefix by default.

Command

Mode BGP configuration mode

Usage In BGP address configuration mode, use the standard IPv4 address for the configuration.

Guide To return to BGP configuration mode, run the command **exit-address-family**.

Configuration The following example enters the IPv4 address family configuration mode.

Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family ipv4
```

Related	Command	Description
Commands	exit-address-family	Exits the mode.

Platform

Description None

5.2 address-family ipv4 vrf

Use this command to enter the IPv4 VRF address family configuration mode to configure BGP and enable the exchange of route information of a VRF. Use the **no** form of this command to restore the default setting.

address-family ipv4 vrf vrf-name

no address-family vrf vrf-name

Parameter	Parameter	Description
Description	vrf-name	VRF name

Defaults No vrf is defined by default.

Command

Mode BGP configuration mode

Usage Guide You can execute this command to configure or exit the exchange of route information between PEs and CEs.

To return to BGP configuration mode, run the **exit-address-family** command.

Configuration Examples

The following example enters the IPv4 VRF address family configuration mode.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
```

Related Commands

Command	Description
exit-address-family	Exits the configuration mode.

Platform

Description N/A

5.3 address-family ipv6

Use this command to enter IPv6 address family configuration mode and enable the exchange of IPv6 route information. Use the **no** form of this command to restore the default setting. Use the **exit-address-family** command to exit BGP address-family configuration mode.

address-family ipv6 [unicast]

no address-family ipv6 [unicast]

Parameter Description

Parameter	Description
unicast	Optional, enters IPv6 unicast address-family configuration mode.

Defaults The configuration mode is unicast address prefix by default.

Command

Mode BGP configuration mode

Usage Guide You can use this command not only to enter IPv6 address-family configuration mode of the BGP to configure the IPv6 neighbors, but also activate neighbors in IPv6 address-family configuration mode after configuring IPv6 neighbors in BGP configuration mode.

The **exit-address-family** command is used to return to BGP configuration mode.

Configuration Examples

The following example enters the IPv6 address family configuration mode.

```
Orion_B54Q(config)# router bgp 65000
```



```
Orion_B54Q(config-router)# address-family ipv6
```

Related Commands

Command	Description
exit-address-family	Exits the mode.

Platform

Description None

5.4 address-family ipv6 vrf

Use this command to enter BGP configuration mode, enable the IPv6 route information exchange function under a vrf. Use **no** form of this command to restore the default setting. Use the **exit-address-family** command to exit BGP address configuration mode.

address-family ipv6 vrf vrf-name

no address-family ipv6 vrf vrf-name

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name

Defaults

No vrf address family is defined by default.

Command Mode

BGP configuration mode

Usage Guide

You can use this command to start configuring (or quit) the exchange of BGP route information between PE or MCE device and CE.

You can use the exit-address-family command to return to BGP configuration mode.

- ✔ If ipv4 vrf and ipv6 vrf address family modes of the same vrf are activated at the same time, and same neighbor is activated in two address family modes, the neighbor's global commands will be displayed in both the address family modes at the same time, while its address family commands will only be displayed under respective address family mode.

Configuration Examples

The following example enters the IPv6 VRF address family configuration mode.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family ipv6 vrf vpn1
```

Configuration Examples

Command	Description
exit-address-family	Exits the mode.

Platform

N/A

Description

5.5 address-family l2vpn

Use this command to enter the L2VPN address family configuration mode and enable the exchange of L2VPN route information between BGP neighbors. Use the **no** or **default** form of this command to restore the default setting.

address-family l2vpn { vpls | vpws }

no address-family l2vpn { vpls | vpws }

default address-family l2vpn { vpls | vpws }

Parameter	Parameter	Description
Description	vpls	L2VPN VPLS address family.
	vpws	L2VPN VPWS address family.

Defaults No L2VPN address family is defined by default.

Command

Mode BGP configuration mode / BGP scope global configuration mode

Usage

Guide Use the **exit-address-family** command to exit the L2VPN address family configuration mode.

Configuration Examples

The following example enters the L2VPN VPLS address family configuration mode.

```
Orion_B54Q(config)# router bgp 100
Orion_B54Q(config-router)# address-family l2vpn vpls
```

Related Commands	Command	Description
	N/A	N/A

Platform

Description N/A

5.6 address-family vpnv4

Use this command to enter the VPNv4 address family configuration mode and enable the exchange of VPN route information between PE peers. Use the **no** or **default** form of this command to restore the default setting.

address-family vpnv4 [unicast]

no address-family vpnv4 [unicast]

default address-family vpnv4

Parameter	Parameter	Description
Description	unicast	Optional, detailed VPNv4 unicast address prefix.

Defaults No VPNv4 address family is defined by default.

Command

Mode BGP configuration mode / BGP scope global configuration mode

Usage

Guide Use the **exit-address-family** command to exit the VPNv4 address family configuration mode.

Configuration Examples The following example enters the VPNv4 address family configuration mode.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family vpnv4
```

Related Commands	Command	Description
	exit-address-family	Exits the mode.

Platform

Description N/A

5.7 address-family vpnv6

Use this command to enter the VPNv6 address family configuration mode and enable the exchange of VPN route information between PE peers. Use the **no** or **default** form of this command to restore the default setting.

address-family vpnv6 [unicast]

no address-family vpnv6 [unicast]

default address-family vpn4

Parameter	Description
unicast	Optional, detailed VPNv6 unicast address prefix. The command without this parameter takes the same effect as the command with this parameter.

Defaults No VPNv6 address family is defined by default.

Command

Mode BGP configuration mode / BGP scope global configuration mode.

Usage

Guide Use the **exit-address-family** command to exit the VPNv6 address family configuration mode.

Configuration Examples The following example enters the VPNv6 address family configuration mode.

```
Orion_B54Q(config)# router bgp 65000
```

```
Orion_B54Q(config-router)# address-family vpv6
```

**Related
Commands**

Command	Description
exit-address-family	Exits the mode.

**Platform
Description**

N/A

5.8 aggregate-address (IPv4)

Use this command to set the aggregate IPv4 route. Use the **no** form of this command to restore the default setting.

aggregate-address *ip-address mask* [**as-set**] [**summary-only**] [**attribute-map** *map-tag*]

no aggregate-address

**Parameter
Description**

Parameter	Description
<i>ip address</i>	IP address of the aggregate route
<i>mask</i>	Mask of the aggregate route
as-set	Keeps the AS path information of the path in the aggregate address range.
summary-only	Advertises only the aggregate route.
attribute-map	Configures the routing policy to control the route attribute.
<i>map-tag</i>	Route map name. Up to 32 characters is allowed.

Defaults

The address aggregation is not configured by default.

**Command
Mode**

BGP configuration mode, IPv4 address family configuration mode, or IPv4 VRF address family configuration mode

**Usage
Guide**

The BGP-enabled device will advertise all path information both before and after aggregation by default. Use the **aggregate-address summary-only** command to advertise the aggregate route only.

**Configuration
Examples**

The following example sets the aggregate IPv4 route.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# aggregate-address 10.0.0.0
255.0.0.0 as-set
```

**Related
Commands**

Command	Description
router bgp	Enables the BGP protocol.

**Platform
Description**

None

5.9 aggregate-address (IPv6)

Use this command to set the aggregate IPv6 route. Use the **no** form of this command to restore the default setting.

aggregate-address *ipv6-network / length* [**as-set**] [**summary-only**] [**attribute-map** *map-tag*]

no aggregate-address *ipv6-network / length*

Parameter	Description
<i>ipv6-network</i>	IP address prefix of the aggregate route
<i>length</i>	Length of the aggregate route
as-set	Keeps the AS path information of the path in the aggregate address range.
summary-only	Advertises only the aggregate route.
attribute-map	Configures the routing policy to control the route attribute.
<i>map-tag</i>	Route map name. Up to 32 characters is allowed.

Defaults The address aggregation is not configured by default.

Command Mode BGP IPv6 address-family configuration mode or BGP IPv6 VRF address-family configuration mode.

Usage Guide The BGP-enabled device will advertise all path information both before and after aggregation by default. Use the **aggregate-address summary-only** command to advertise the aggregate route only.

The following example sets the aggregate IPv6 route.

Configuration Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family ipv6
Orion_B54Q(config-router-af)# aggregate-address 2008::/90 as-set
```

Related Command	Command	Description
	router bgp	Enables the BGP protocol.

Platform Description None

5.10 bfd bind bgp

Use this command to manually configure the BFD session for the BGP protocol. Use the **no** or **default** form of the command to restore the default setting.

bfd bind bgp peer-ip *ip-address* [**vrf** *vrf-name*] **interface** *interface-type interface-index* **source-ip** *ip-address*

no bfd bind bgp peer-ip *ip-address* [**vrf** *vrf-name*] **interface** *interface-type interface-index* **source-ip** *ip-address*

default bfd bind bgp peer-ip *ip-address* [**vrf** *vrf-name*] **interface** *interface-type interface-index* **source-ip** *ip-address*

Parameter	Parameter	Description
Description	peer-ip <i>ip-address</i>	Peer IP address.
	vrf <i>vrf-name</i>	The VRF instance where the BFD session is. The default is global VRF.
	interface <i>interface-type interface-index</i>	Outbound interface type and its index.
	source-ip <i>ip-address</i>	Local IP address.

Defaults No static BFD session is configured for BGP by default.

Command

Mode Global configuration mode

Usage To perform Fast-Reroute, a BFD session should be created between local device and the next-hop device to perform fast link failure detection. In general, BGP-based BFD session can realize the function. When the next-hop device is not the neighbor device, the BFD session should be configured manually.

Configuration Examples

The following example configures a static BFD session for BGP.

```
Orion_B54Q(config)# bfd bind bgp peer-ip 10.0.0.1 interface
GigabitEthernet 0/1 source-ip 10.0.0.2
```

Related Commands	Command	Description
	N/A	N/A

Platform

Description N/A

5.11 bgp advertise non-transitive extcommunity

Use this command to allow carried non-transitive extcommunity when BGP is notifying EBGp neighbors of a route. Use the **no** form of this command to restore the default setting.

bgp advertise non-transitive extcommunity
no bgp advertise non-transitive extcommunity

Parameter	Parameter	Description
Description	N/A	N/A

Defaults Non-transitive extcommunity is removed when notifying EBGp neighbors of a route.

Command BGP configuration mode / Scope global configuration mode

Mode

Usage Guide By default, when notifying EBGP neighbors of a route, neighbors will not be notified of extcommunity with the "non-transitive" flag. This configuration can enable the notification of non-transitive extcommunity.

- Non-transitive extcommunity will be carried when notifying alliance EBGP or IBGP neighbors of a route.

Configuration Examples The following example allows carried non-transitive extcommunity.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp advertise non-transitive extcommunity
```

Command	Description
router bgp	Enables BGP protocol.

Platform N/A

Description

5.12 bgp always-compare-med

Use this command to compare Multi Exit Discriminator (MED) all the time. Use the **no** form of this command to restore the default setting.

bgp always-compare-med

no bgp always-compare-med

Parameter	Parameter	Description
Description	N/A	N/A

Defaults MED of peer paths from the same AS is compared by default.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage Guide The MED value is compared for paths of peers from the same AS by default. This command can be used to allow comparing MED values for paths from different ASs. If there are multiple valid paths to the same destination, the one with lower MED value has higher priority.

This command is not recommended unless you are sure that different ASs are using the same IGP and routing method.

Configuration Examples The following example compares Multi Exit Discriminator (MED) all the time.

```
Orion_B54Q(config)# router bgp 65000
```

```
Orion_B54Q(config-router)# bgp always-compare-med
```

Related Commands

Command	Description
show ip bgp	Displays the BGP route entry.
bgp bestpath med confed	Compares the MED value of paths of peers from different ASs when selecting the optimal path.
bgp bestpath med missing-as-worst	Sets the priority of the path without MED attribute as the lowest when selecting the optimal path.
bgp deterministic-med	Compares paths of peers from the same AS when selecting the optimal path.

Platform

Description None

5.13 bgp asnotation dot

Use this command to modify the displaying mode of the 4-byte AS notation and the matching type of the regular expression as the dot mode (that is, two dotted decimal numbers). Use the **no** form of this command to restore the default setting.

bgp asnotation dot

no bgp asnotation dot

Parameter Description

Parameter	Description
N/A	N/A

Defaults

The 4-byte AS notation is shown in decimal digit, and the regular expression also matches the 4-byte AS notation with decimal digit by default.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage Guide

Our devices support two modes of representing the 4-byte AS notation. One is decimal digit, and the other one is dot mode which represents the 65536 with 1.0. The decimal format is same as the default format, which represents the 4-byte AS notation with decimal digits. The dot mode displays the 4-byte AS notation in the format of ([two high bytes.] two low bytes). If the [two high bytes.] is zero, it will not be displayed. That is, the AS notation represented as 65536 in decimal is 1.0 in the dot mode. In another example, the AS notation is 65534 represented in decimal, while it is represented as 65534 in the dot mode without the zero in front.

No matter which mode will be adopted to display the 4-byte AS notation, both modes can be used when entering the configuration commands. But the representation and displaying mode of the 4-byte AS notation in the regular expression must be the same. Otherwise, the matching will fail. After executing the **bgp asnotation** command, you must use the clear ip bgp * to perform the resetting, so as to re-match the filtering condition of the regular expression.

 The AS notation is represented as 1 to 65535 no matter using decimal or dot mode.

Configuration Examples

The following example modifies the showing mode of the 4-byte AS notation.

```
Orion_B54Q(config)# router bgp 1.0
Orion_B54Q(config-router)# bgp asnotation dot
```

Related Commands

Command	Description
show ip bgp summary	Displays the related information of BGP neighbor.

Platform

Description None

5.14 bgp bestpath as-path ignore

Use this command to disregard the length of the AS path. Use the **no** form of this command to restore the default setting.

bgp bestpath as-path ignore

no bgp bestpath as-path ignore

Parameter Description

Parameter	Description
N/A	N/A

Defaults

The AS path length is considered in choosing the optimal path by default.

Command Mode

BGP configuration mode / Scope global configuration mode

Usage Guide

BGP will not take the length of the AS path into account when it selects the optimal path as specified in RFC1771. In general, the shorter the length of the AS path, the higher the path priority is. Hence, we take the length of the AS path into account when we select the optimal path. You can determine whether it is necessary to take the length of the AS path into account when you select the optimal path according to the actual condition.

Configuration Examples

The following example disregard the length of the AS path.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp bestpath as-path ignore
```

Related Commands

Command	Description
show ip bgp	Displays the BGP route entry.

Platform

None

Description

5.15 bgp bestpath as-path multipath-relax

Use this command to enable AS path multipath-relax (only comparing the AS path length) for BGP multipathing load. Use the **no** form of this command to restore the default setting.

bgp bestpath as-path multipath-relax

no bgp bestpath as-path multipath-relax

Parameter Description	Parameter	Description
	N/A	N/A

Command Mode BGP requires that AS path attributes must be the same when calculating equal-cost multipath (ECMP) by default.

Defaults BGP configuration mode / Scope global configuration mode

Usage Guide BGP compares AS path attributes in a precise way when selecting the optimal path as ECMP by default. Only paths with same AS path attributes can constitute equal-cost paths. As a result, BGP multipathing load balancing cannot be implemented in an application scenario. After AS path multipath-relax is enabled, only the AS path length is compared, allowing the implementation of BGP multipathing load balancing.

Configuration Examples The following example enables AS path multipath-relax for BGP multipathing load.

```
Orion_B54Q(config)# router bgp 65530
Orion_B54Q(config-router)# bgp bestpath as-path multipath-relax
```

Related Commands	Command	Description
	router bgp	Enables BGP.
	show ip bgp	Displays BGP routing entries.

Platform None

Description

5.16 bgp bestpath compare-confed-aspash

Use this command to compare the AS path length of the confederation from the same external routes when selecting the optimal path, with smaller AS path in the confederation for higher path priority. Use the **no** form of this command to restore the default setting.

bgp bestpath compare-confed-aspash

no bgp bestpath compare-confed-aspash

Parameter Description	Parameter	Description
	N/A	N/A

Defaults The AS path of the EBGP peer routes inside the same confederation is not compared by default when selecting the optimal path. Instead, the routing method is implemented.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage During the selection of the same routing information from the peer of the internal EBGP By default, the AS path of the confederation is not compared. This command is used to compare the AS path of the confederation.

Guide

Note that if a route contain no AS path of the confederation, it is impossible to implement the AS path comparison for that route.

Configuration

The following example compares the AS path length of the confederation.

Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp bestpath compare-confed-aspash
```

**Related
Commands**

Command	Description
show ip bgp	Displays the BGP route entry.
bgp router-id	Sets the BGP Device ID.

Platform

Description None

5.17 bgp bestpath compare-routerid

Use this command to compare the router ID of the same external routes when selecting the optimal path, with smaller router ID for higher path priority. Use the **no** form of this command to restore the default setting.

bgp bestpath compare-routerid

no bgp bestpath compare-routerid

**Parameter
Description**

Parameter	Description
N/A	N/A

Defaults

If two paths received from different EBGP peers have the same path, the first one is considered with higher priority by default.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage

If two paths with identical path attributes are received from different EBGP peers during the

Guide selection of the optimal path, we will select the optimal path according to the sequence of receiving the paths by default. You can select the path with smaller Device ID as the optimal path by configuring the following commands.

Configuration The following example compares the router ID of the same external routes.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp bestpath compare-routerid
```

Command	Description
show ip bgp	Displays the BGP route entry.
bgp router-id	Sets the BGP Device ID.

Platform
Description None

5.18 bgp bestpath med confed

Use this command to compare the MED value of the path of the internal peer from AS confederation during selecting the optimal path. Use the **no** form of this command to restore the default setting.

bgp bestpath med confed [missing-as-worst]

no bgp bestpath med confed [missing-as-worst]

Parameter	Description
missing-as-worst	Sets the priority of the path without MED attribute as the lowest.

Defaults The MED value of the path of the peer inside the AS confederation is not compared by default when selecting the optimal path.

Command
Mode BGP configuration mode / Scope global configuration mode

Usage The MED attribute of the path is transferred between the ASs inside the confederation. You may set always comparing this value.
Guide

Configuration The following example compares the MED value of the path of the internal peer.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp bestpath med confed
```

Command	Description
show ip bgp	Displays the BGP route entry.
bgp always-compare-med	Compares the MED value of paths of peers from different ASs when selecting the optimal path.

	Command	Description
Related Commands	bgp bestpath med missing-as-worst	Sets the priority of the path without MED attribute as the lowest when selecting the optimal path.
	bgp deterministic-med	Compares paths of peers from the same AS when selecting the optimal path.

Platform
Description None

5.19 bgp bestpath med missing-as-worst

Use this command to set the priority of the path without MED attribute as the lowest when selecting the optimal path. Use the **no** form of this command to restore the default setting.

bgp bestpath med missing-as-worst
no bgp bestpath med missing-as-worst

	Parameter	Description
Parameter Description	N/A	N/A

Defaults
 If a path without MED attribute is received, the MED value of the path is 0 by default. Such route has the highest priority according to the above-mentioned rule.

Command Mode
 BGP configuration mode / Scope global configuration mode

Usage Guide
 The MED value of a path without MED attribute will be 0 by default. For the smaller the MED value, the higher the priority of the path is, the MED value of this path has the highest priority. This command can be used to figure the path without MED attribute has the lowest priority.

Configuration Examples
 The following example sets the priority of the path without MED attribute as the lowest.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp bestpath medmissing-as-worst
```

	Command	Description
Related Commands	show ip bgp	Displays the BGP route entry.
	bgp always-compare-med	Compares the MED value of paths of peers from different ASs when selecting the optimal path.
	bgp bestpath med confed	Sets the priority of the path without MED attribute as the lowest when selecting the optimal path.
	bgp deterministic-med	Compares paths of peers from the same AS when selecting the optimal path.

Platform None

Description

5.20 bgp client-to-client reflection

Use this command to enable the route reflection function between clients on the device. Use the **no** form of this command disables the route reflection function between clients.

bgp client-to-client reflection

no bgp client-to-client reflection

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is enabled without the client for route reflection by default.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage Guide

In general, it is unnecessary to establish the connection relationship between the clients of the route reflector within the cluster, and the route reflector will reflect the route among clients. However, if the full connection relationship is established for all clients, the function for the route reflector to reflect the client route can be disabled.

To disable the route reflection function, use the command **no bgp client-to-client reflection**.

Configuration Examples

The following example shows how to enable the route reflection function between clients on the device.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# no bgp client-to-client reflection
```

Related Commands

Command	Description
bgp cluster-id	Configures the cluster ID of the route reflector.
neighbor route-reflector-client	Configures the client of the route reflector and configure itself as the route reflector.

Platform

Description None

5.21 bgp cluster-id

Use this command to configure the cluster ID of the route reflector. Use the **no** form of this command to restore it to the default setting.

bgp cluster-id *cluster-id*

no bgp cluster-id

Parameter	Parameter	Description
Description	<i>cluster-id</i>	Cluster ID of the route reflector, an IP address of up to four bytes or an integer (must be entered in form of IP address)

Defaults The cluster id is the router-id of the route reflector by default.

Command

Mode BGP configuration mode / Scope global configuration mode

Usage Guide In general, one group is only configured with one route reflector. In this case, the Device ID of the route reflector can be used to identify this cluster. To increase the redundancy, you can set more than one route reflector within this cluster. In this case, you must configure the cluster ID, so that one route reflector can identify the route update from other route reflectors of this cluster.

Configuration Examples The following example configures the cluster ID of the route reflector.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp cluster-id 10.0.0.1
```

Related Commands	Command	Description
	bgp client-to-client reflection	Configures the route reflection between clients.
	neighbor route-reflector-client	Configures the client of the route reflector and configures itself as the route reflector.

Platform

Description None

5.22 bgp confederation identifier

Use this command to configure the AS confederation identifier. Use the **no** form of this command to restore the default setting.

bgp confederation identifier *as-number*

no bgp confederation identifier

Parameter	Parameter	Description
Description	<i>as-number</i>	AS confederation identifier in the range from 1 to 65535 In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new range of the new AS notation is from 1 to 4294967295, which is represented as 1 to 65535.65535 in dot mode.

Defaults There is no confederation identifier by default

Command

Mode BGP configuration mode

Usage Guide

The confederation is a measure to reduce the connections of IBGP peers within the AS. One AS is divided into several sub ASs and one unified confederation ID (namely, confederation AS number) is set to constitute these sub ASs into a confederation. For the external confederation, the whole confederation is still considered as one AS, and only the confederation AS number is visible for the external network. Within the confederation, the full IBGP peer connection is still established among the BGP Speakers within the sub AS, and the EBGP connection is established among the BGP Speakers within the sub AS. Despite of the EBGP connections established between the BGP speakers in an AS, the next-hop, MED and local priority information remains unchanged in exchanging the information.

Configuration Examples The following example configures the AS confederation identifier.

```
Orion_B54Q(config-router)# bgp confederation identifier 65000
```

Related Commands

Command	Description
bgp confederation peers	Adds member AS of the AS confederation.

Platform

Description None

5.23 bgp confederation peers

Use this command to configure member ASs of the AS confederation. Use the **no** form of this command to restore the default setting.

bgp confederation peers *as-number* [...*as-number*]

no bgp confederation peers *as-number* [...*as-number*]

Parameter Description

Parameter	Description
<i>as-number</i>	Member ASs in the confederation range from 1 to 65535. In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new range of the new AS notation is from 1 to 4294967295, represented as 1 to 65535.65535 in dot mode.

Defaults There is no confederation member by default.

Command

Mode BGP configuration mode

Usage Guide

The confederation is a measure to reduce the connections of BGP peers within the AS. One AS is divided into several sub ASs and one unified confederation ID (namely, confederation AS number) is set to constitute these sub ASs into a confederation. The whole external confederation is still considered as one AS, and only the confederation AS number is visible for the external network. Within the confederation, the full IBGP peer connection is still established among the BGP Speakers within the sub AS, and the EBGP connection is established among the BGP Speakers within the sub AS. Despite of the EBGP connections established between the BGP speakers in an AS, the next-hop, MED and local priority information remains unchanged in exchanging the information.

This command is used to specify the member AS of a confederation.

- i This command can configure up to 15 members of a confederation at one time. For more members, enter them for several times.

Configuration Examples

The following example configures member ASs of the AS confederation.

```
Orion_B54Q(config-router)# bgp confederation peers 65000 65100
```

Related Commands

Command	Description
bgp confederation identifier	Configures the confederation identifier.

Platform

Description None

5.24 bgp dampening

Use this command to enable the routing attenuation and set the attenuation parameters in the address-family or routing configuration mode. Use the **no** form of this command to restore the default setting.

bgp dampening [*half-life* [*reusing suppressing duration*] | **route-map** *name*]

no bgp dampening

Parameter Description

Parameter	Description
<i>half-life</i>	Half-life period, ranging from 1 to 45 minutes
<i>reusing</i>	When the penalty value reaches this value, the routing suppression is cancelled. The value ranges from 1 to 20000.
<i>suppressing</i>	When the penalty value reaches this value, routing is suspended. The value ranges from 1 to 20000.
<i>duration</i>	Maximum time for routing suppression, ranging from 1 to 255 minutes
<i>name</i>	Route-map name, apply the routing attenuation to the specified route through the route-map.

Defaults

This function is disabled by default.

Command Mode BGP configuration mode, BGP IPv4 unicast address-family configuration mode, BGP IPv4 multicast address-family configuration mode, BGP IPv4 MDT address-family configuration mode, BGP IPv4 VRF address-family configuration mode, BGP IPv6 unicast address-family configuration mode, BGP IPv6 unicast address-family configuration mode, or BGP IPv6 multicast address-family configuration mode.

Usage Guide The **bgp dampening** command is used to suppress unstable BGP routing. The BGP uses the penalty value to describe routing suppression intensity. The penalty value increases 1000 when the routing oscillation is performed once. The suppressed routes will not be used during the BGP routing election.

Configuration Examples The following example enables the routing attenuation and set the attenuation parameters.

```
Orion_B54Q(config-router)# bgp dampening 30 1500 10000 120
```

Command	Description
clear ip bgp dampening	Clears the BGP suppression and cancels the suppression for the routes.
show ip bgp dampening dampened-paths	Displays the suppressed route information.

Platform Description None

5.25 bgp default ipv4-unicast

Use this command to set the IPv4 unicast address as the default address family. Use the **no** form of this command to restore the default setting.

bgp default ipv4-unicast
no bgp default ipv4-unicast

Parameter	Parameter	Description
Description	N/A	N/A

Defaults The IPv4 unicast address is the default address family.

Command Mode BGP configuration mode

Usage Guide This command is used to set the default address family of BGP as the IPv4 unicast address.

Configuration Examples The following example sets the IPv4 unicast address as the default address family.

```
Orion_B54Q(config-router)# default ipv4-unicast
```

Related Commands	Command	Description
	address-family ipv4	Enters the IPv4 address mode.

Platform Description None

5.26 bgp default local-preference

Use this command to set the default local-preference attribute value. Use the **no** form of this command to restore the default setting.

bgp default local-preference value

no bgp default local-preference

Parameter Description	Parameter	Description
	<i>value</i>	Local priority attribute, in the range from 0 to 4294967295

Defaults The local preference value is 100 by default.

Command Mode BGP configuration mode, BGP IPv4 VRF address-family configuration mode or BGP IPv6 VRF address-family configuration mode.

Usage Guide The BGP takes the local preference as the foundation to compare with the priority of the path learned from IBGP peers. The larger the local preference value, the higher the priority of the path is.

The BGP speaker sends the external route received to the IBGP peers to add the local priority value.

Configuration Examples The following example sets the default local-preference attribute value.

```
Orion_B54Q(config-router)# bgp default local-preference 200
```

Related Commands	Command	Description
	show ip bgp	Displays the BGP route entry.
	bgp always-compare-med	Allows comparing the MED value of the path of the peer from different ASs when electing the optimal path.
	bgp bestpath med confed	Allows comparing the MED value of paths of internal peers from AS community when electing the optimal path.
	bgp bestpath med missing-as-worst	Allows setting the priority of the path without MED attribute as the lowest when electing the optimal path.

Platform Description None

5.27 bgp default route-target filter

Use this command to enable the route-target filtering. For the VPNv4 routes, filter the community attributes of the route-target by default. Use the **no** form of this command to disable this function.

bgp default route-target filter

no bgp default route-target filter

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is enabled by default.

Command Mode BGP configuration mode, VPNv4 address-family configuration mode, or BGP L2VPN VPLS/VPWS address-family configuration mode.

Usage After receiving the VPNv4 route, use the community attributes list of the route-target to filter and distribute different VRFs. With the no form of this command used, the BGP will receive all VPNv4 routes no matter whether these filtered VPNv4 routes will be received by route-target of local VRF.

Guide With the PE route-reflector-client configured for the BGP, the VPNv4 route will not be processed through the route-target filtering. In this case, whether the BGP is enabled, the actions are the same without the route-target filtering.

Configuration Examples The following example enables the route-target filtering.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# no bgp default route-target filter
```

Related Commands	Command	Description
	neighbor route-reflector-client	Configures the route-reflector-client, and sets itself as the route reflector.

Platform Description N/A

5.28 bgp deterministic-med

Use this command to set comparing preferentially the MED values of peer paths from the same AS. By default, the comparison is based on the received order, and the one received the last is compared first. Use the **no** form of this command to restore the default setting.

bgp deterministic med

no bgp deterministic med

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is disabled by default.

Command

Mode BGP configuration mode

Usage Guide They will be compared with each other according to the sequence the paths are received when the optimal path is selected by default. Execute the following operations in the BGP configuration mode to compare paths of peers from the same AS firstly:

Configuration The following example sets the comparing preferentially MED values.

Examples

```
Orion_B54Q(config-router)# bgp deterministic med
```

Command	Description
show ip bgp	Displays the BGP route entry.
bgp always-compare-med	Compares the MED value of paths of peers from different ASs when selecting the optimal path.
bgp bestpath med confed	Sets the priority of the path without MED attribute as the lowest when selecting the optimal path.
bgp bestpath med missing-as-worst	Compares paths of peers from the same AS when selecting the optimal path.

Related Commands

Platform Description None

5.29 bgp enforce-first-as

Use this command to reject the UPDATE messages whose first AS_PATH path section is not the neighbor-configured AS number. Use the **no** form of this command to disable this function.

bgp enforce-first-as

no bgp enforce-first-as

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is enabled by default.

Command

Mode BGP configuration mode

Usage The AS number of the device is put into the path section by default to update the update message.

Guide

Configuration Examples The following example rejects the UPDATE messages whose first AS_PATH path section is not the neighbor-configured AS number.

```
Orion_B54Q(config-router)# bgp enforce-first-as
```

Related Commands	Command	Description
	show ip bgp	Displays the BGP route entry.

Platform

Description None

5.30 bgp fast-external-fallover

When the network interface used in establishing the connection of the directly-connected EBGP peer fails, use this command to establish the BGP session connection quickly. Use the **no** form of this command to disable this function.

bgp fast-external-fallover

no bgp fast-external-fallover

Parameter Description	Parameter	Description
	N/A	N/A

Defaults This function is enabled by default.

Command

Mode BGP configuration mode

Usage

Guide This command takes effect only for the directly-connected EBGP neighbor.

Configuration Examples The following example creates the fast BGP session.

```
Orion_B54Q(config-router)# bgp fast-external-fallover
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.

Platform

Description None

5.31 bgp graceful-restart

Use this command to enable the global BGP graceful restart function. Use the **no** form of this command to disable BGP graceful restart.

bgp graceful-restart

no bgp graceful-restart

Parameter	Parameter	Description
Description	N/A	N/A

Defaults By default, BGP graceful restart is enabled so as to help neighbors to perform graceful restart.

Command

Mode BGP configuration mode

The ability of the BGP is advertised and negotiated through the ability field of the Open message. The ability is negotiated during initially setting up the connection. So both sides must reach the consistency of the ability. If it is not supported by any side, this router device will perform the GR incorrectly.

With the GR function enabled, the connected Open message will carry the GR ability field to perform the negotiation of the GR ability. To implement the GR correctly, the GR function must be enabled on both sides of the neighbors.

Usage Guide

- i This command does not take effect immediately on all BGP connections that are set up successfully. To negotiate the GR ability immediately, you need to restart the BGP connection to make the local device negotiate the GR ability with the Peer again by using the `clear ip bgp` command.

The BGP graceful-restart is used to forward data continuously of the whole network, it requires the device to keep the BGP routing entry valid and forward data continuously when restarting the BGP protocol. Supporting the continuous forwarding during the restarting is related to the hardware ability.

Configuration Examples

The following example enables the graceful restart function of the global BGP.

```
Orion_B54Q(config)# router bgp 500
Orion_B54Q(config-router)# bgp graceful-restart
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
bgp graceful-restart restart-time	Configures the restart time of the BGP graceful-restart.

Platform

Description N/A

5.32 bgp graceful-restart disable

Use this command to disable GR capability of a BGP address family. Use the **no** form of this command to restore the default setting.

bgp graceful-restart disable
no bgp graceful-restart disable

Parameter Description	Parameter	Description
	N/A	N/A

Defaults The function is disabled by default.

Command Mode BGP configuration mode, IPv4 unicast address family mode, VPNv4 address family mode, IPv4 tag address family mode and IPv6 unicast address family mode

Usage Guide When BGP GR function is enabled, the GR capability for all address families is enabled by default, except for address families that do not support GR capability. After GR capability is enabled, you can use this command in the address family mode to disable the address family's GR capability. The Configuration of this command in BGP mode is effective on IPv4 Unicast address family. When BGP GP function is disabled, GR capability is disabled for all address families.

Configuration Examples The following example enables the graceful restart function of the global BGP.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp graceful-restart
Orion_B54Q(config-router)# address-family ipv4
Orion_B54Q(config-router-af)# bgp graceful-restart disable
```

Configuration Examples	Command	Description
	bgp graceful-restart	Enables BGP's GR capability.
	address-family ipv4	Enters BGP IPv4 address family mode.

Platform Description N/A

5.33 bgp graceful-restart restart-time

Use this command to configure the restart time of the BGP graceful-restart. Use the **no** form of this command to restore the default setting.

bgp graceful-restart restart-time restart-time
no bgp graceful-restart restart-time

Parameter Description	Parameter	Description
	<i>restart-time</i>	GR Restarter-hoped longest waiting time before re-

Parameter	Description
Parameter Description	establishing the connection between the GR Helper and the GR Restarter, in the range from 1 to 3600 in the unit of seconds.

Defaults The default is 120.

Command

Mode BGP configuration mode.

The restart time is advertised by GR Restarter to GR Helper, it is GR Restarter-hoped longest waiting time before re-establishing the connection between GR Helper and GR Restarter. After this time, if the BGP connection with GR Restarter is not in Established status, GR Helper will consider this BGP session failed and will restore the normal BGP. All the routing of the neighbor will be deleted during this period, affecting the data redistribution.

The restart time is advertised in the GR ability field of the BGP Open message. The GR restart time of the two ends of the session is not required to be the same, but it is recommended.

Usage Guide

- i** This command does not take effect immediately on all BGP connections that are set up successfully. To advertise the newly set restart time to the GR helper, you need to restart the BGP connection to negotiate the GR ability again and advertise the restart time by using the clear ip bgp command. The configured restart time should not be greater than the Hold Time of the BGP peer, if so, the Hold time will be the restart time when the GR ability is advertised to the BGP peer.

The following example configures the restart time of the BGP graceful-restart.

Configuration Examples

```
Orion_B54Q(config)# router bgp 500
Orion_B54Q(config-router)# bgp graceful-restart
Orion_B54Q(config-router)# bgp graceful-restart restart-time 150
Orion_B54Q(config-router)# no bgp graceful-restart restart-time
```

Related Commands	Command	Description
	bgp graceful-restart	Enables the BGP graceful-restart.

Platform N/A
Description

5.34 bgp graceful-restart stalepath-time

Use this command to configure the time to help the device keep the route valid when executing the BGP graceful-restart. Use the **no** form of this command to restore the default setting.

bgp graceful-restart stalepath-time stalepath-time *time*

no bgp graceful-restart stalepath-time

Parameter	Description
<i>time</i>	Longest time used to keep the stale route valid after restoring the connection with the neighbors, in the range from 1 to 3600 in the unit of seconds

Defaults The default is 360.

Command Mode BGP configuration mode

Usage Guide This command is configured for the parameters of the GR Helper. The stalepath-time is the longest time of the GR Helper waiting to receive the EOR mark of the Restarter after restoring the connection with the GR Restarter. When the GR Helper detects that the connection with the GR Restarter fails, the original route of the Restarter is marked as the "Stale". However these routes are still used for the routing calculation and forwarding.

The GR Helper updates the routes and cancels the "Stale" mark according to route updating information received from the GR Restarter. If routes marked as "Stale" are not updated in the stalepath-time period, they will be deleted. This mechanism is used to avoid failure in convergence of routes when the GR Helper fails to receive the EOR mark of the GR Restarter for a long time.

Configuration Examples The following example configures the restart time of the BGP graceful-restart.

```

Orion_B54Q(config)# router bgp 500
Orion_B54Q(config-router)# bgp graceful-restart
Orion_B54Q(config-router)# bgp graceful-restart stalepath-time 240
Orion_B54Q(config-router)# no bgp graceful-restart stalepath-time
    
```

Related Commands	Command	Description
	bgp graceful-restart	Enables the BGP graceful-restart.

Platform Description N/A

5.35 bgp initial-advertise-delay

Use this command to configure the delay period before a BGP device sends its initial updates to peers. Use the **no** form or **default** form of this command to restore the default setting.

bgp initial-advertise-delay *delay-time* [*startup-time*]

no bgp initial-advertise-delay

default bgp initial-advertise-delay

Parameter	Parameter	Description
Description	<i>delay-time</i>	The delay period, in seconds, before a BGP device sends its updates. The range is from 1 to 600. The default value is 1 second.
	<i>startup-time</i>	The time for the BGP device restart. In the period, the neighbor does not send its updates to peers. The range is from 5 to 584,000. The unit is second and the default value is 600 seconds.

Defaults The initial advertisement delay is disabled by default.

Command

Mode BGP configuration mode

Usage When BGP is started, it waits a specified period of time (delay time) for its neighbors to be established themselves and to begin sending their initial updates. Once that period is complete, or when the time expires, the software starts sending advertisements out to its peers. After that, BGP sends the updates at the interval configured through the **neighbor advertisement-interval** command. The startup-time is the time that the device startup. In the period of startup-time, BGP waits the delay-time before sending its updates. This command enables the BGP peers to change the neighbor update advertisement after restart.

Guide

The **bgp initial-advertise-delay** command is used to tune the initial delay period before a BGP device sends its first updates depending on the hardware limitation, the number of neighbors and routes.

Configuration

The following example configures initial delay to 60 seconds within 500 seconds after BGP restart.

Examples

```
Orion_B54Q(config)# router bgp 500
Orion_B54Q(config-router)# bgp initial-advertise-delay 60 500
```

Related Commands

Command	Description
bgp graceful-restart	Enables the BGP graceful-restart.

Platform N/A

Description

5.36 bgp log-neighbor-changes

Use this command to log the BGP status changes without turning on debug. Use the **no** form of this command to disable this function.

bgp log-neighbor-changes

no bgp log-neighbor-changes

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is enabled by default.

Command

Mode BGP configuration mode

Usage The debug command can also be used to log BGP status changes. But this command may

Guide consume many resources.

Configuration The following example logs the BGP status changes without turning on debug.

Examples

```
Orion_B54Q(config-router)# bgp log-neighbor-changes
```

Related	Command	Description
Commands	router bgp	Enables the BGP protocol.

Platform

Description None

5.37 bgp maxas-limit

Use this command to set the maximum number of ASs in the BGP AS-PATH attribute. Use the **no** or **default** form of the command to restore the default configuration.

bgp maxas-limit *number*

no bgp maxas-limit

default bgp maxas-limit

Parameter	Parameter	Description
Description	<i>number</i>	The maximum number of ASs in the BGP AS-PATH attribute. The range is from 1 to 512.

Defaults No maximum number of ASs is set by default.

Command

Mode BGP configuration mode/ BGP scope global configuration mode.

Usage The routes exceeding the AS number limit are discarded directly, After changing the configuration,

Guide use the **clear** command to reset the neighbor and make the configuration take effect.

Configuration The following example sets the maximum number of ASs in the BGP AS-PATH attribute to 100.

Examples

```
Orion_B54Q(config-router)# bgp maxas-limit 100
```

Related	Command	Description
Commands	N/A	N/A

Platform

Description N/A

5.38 bgp mp-error-handle session-retain

Use this command to retain BGP sessions when BGP protocol detects errors in multi-protocol route attributes. Use the **no** form of this command to restore the default setting.

bgp mp-error-handle session-retain [recovery-time *time*]

no bgp mp-error-handle session-retain

Parameter Description

Parameter	Description
recovery-time <i>time</i>	Configures the waiting time for auto route recovery. The parameter ranges from 10 to 4294967296 in the unit of seconds. The default is 120.

Defaults By default, BGP sessions will be interrupted when multi-protocol attribute errors are detected.

Command Mode BGP configuration mode

Usage Guide By default, when UPDATA packets are received from a neighbor, BGP sessions will be interrupted if multi-protocol attribute errors are detected, which will cause oscillation of routes of all the address families of the neighbor. An address family's route error will affect the stability of routes of other address families. After this command is configured, when an error of the route attribute of an address family occurs, all the route information of the address family and neighbor will be deleted, thus preventing impact on the BGP session and other protocol address families, improving BGP protocol's stability.

The option `recovery-time` is used to configure the waiting time for auto route recovery. To use the option, the neighbor must support the route refreshing capability. After `recovery-time` expires, BGP will send a route-refresh message to the neighbor's address family and re-notify the neighbor of the address family's all route information.

Configuration Examples The following example retains BGP sessions when BGP protocol detects errors in multi-protocol route attributes.

```
Orion_B54Q(config-router)# bgp mp-error-handle session-retain
```

Configuration Examples

Command	Description
N/A	N/A

Platform Description N/A

5.39 bgp nexthop trigger delay

Use this command to configure the delay time for updating the routing table when the nexthop of the BGP route changes. Use the **no** form of this command to restore the default setting.

bgp nexthop trigger delay *delay-time*

no bgp nexthop trigger delay

Parameter	Parameter	Description
Description	<i>delay-time</i>	Delay time for updating the routing table when the nexthop changes, in the range from 0 to 100 in the unit of seconds

Defaults The default is 5.

Command Mode BGP configuration mode, IPv4/IPv6/VPNv4 address family configuration mode, IPv4 VRF address family configuration mode

Usage Guide This command is used to configure the delay time for updating the routing table when the nexthop changes, it takes effect when the bgp nexthop trigger enable switch is opened.

Configuration Examples The following example retains BGP sessions when BGP protocol detects errors in multi-protocol route attributes.

```
Orion_B54Q(config-router)# bgp nexthop trigger delay 30
```

Related Commands	Command	Description
	bgp nexthop trigger enable	Enables the nexthop trigger.

Platform Description None

5.40 bgp nexthop trigger enable

Use this command to enable the nexthop trigger update function. Use the **no** form of this command to disable this function.

bgp nexthop trigger enable

no bgp nexthop trigger enable

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is enabled by default.

Command BGP configuration mode, IPv4/IPv6/VPNv4 address-family configuration mode, BGP IPv4 VRF address-family configuration mode or BGP IPv6 VRF address-family configuration mode.

Mode

Usage

Guide This command is used to enable the nexthop trigger update function.

Configuration The following example enables the nexthop trigger update function.

Examples

```
Orion_B54Q(config-router)# bgp nexthop trigger enable
```

Command	Description
Bgp nexthop trigger delay	Sets the delay time for updating the routing table when the nexthop changes.

Related Commands

Platform

Description None

5.41 bgp notify unsupport-capability

Use this command to enable the neighbor address family capability detection function. Use the **no** form of this command to restore the default setting.

bgp notify unsupport-capability
no bgp notify unsupport-capability

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is disabled by default.

Command BGP configuration mode

Mode

Usage Guide When BGP neighbor address family capability negotiation is not fully consistent, neighbors can still be connected. After this command is configured, when an address family capability supported by the local device is not supported by the neighbor device, Notification packet that carries the address family that does not support the capability will be send.

Configuration Examples The following example enables the neighbor address family capability detection function.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp notify unsupport-capability
```

Command	Description
router bgp	Enables BGP protocol.

Platform N/A
Description

5.42 bgp redistribute-internal

Use this command to control BGP whether to allow redistributing routes learned from IBGP, such as RIP, OSPF and ISIS, to the IGP protocol. Use the **no** form of this command to disable this function.

bgp redistribute-internal

no bgp redistribute-internal

Parameter	Parameter	Description
Description	N/A	N/A

Defaults IBGP routes are allowed by default to be redistributed to the IGP protocol.

Command Mode BGP configuration mode, IPv4/IPv6 address family configuration mode, IPv4 VRF address family configuration mode

Usage Guide This command is used to control whether IBGP routes are allowed to be redistributed to the IGP protocol.

Configuration Examples The following example enables the BGP to learn the redistributing routes from IBGP.

```
Orion_B54Q(config-router)# bgp redistribute-internal
```

Related Commands	Command	Description
	redistribute	Redistributes routes learned from other protocols.

Platform Description None

5.43 bgp router-id

Use this command to configure the ID-IP address of the device. Use the **no** form of this command to restore the default setting.

bgp router-id ip-address

no bgp router-id

Parameter	Parameter	Description
Description	<i>ip address</i>	IP address

Defaults The loop-back interface of the device is selected preferentially by default. If it does not exist, the device route-id of the device is used.

Command

Mode BGP configuration mode

Usage Guide This command is used to configure IP address, the ID of the device when running the BGP protocol.

Configuration Examples The following example configures the ID-IP address of the device.

```
Orion_B54Q(config-router)# bgp router-id 10.0.0.1
```

Related Commands

Command	Description
show ip bgp dampening dampened-paths	Displays the suppressed routing information.
bgp dampening	Enables the route dampening function and sets dampening parameters.

Platform

Description None

5.44 bgp scan-rib disable

Use this command to update the routing table by event triggering. Use the **no** form of this command to restore the default setting.

bgp scan-rib disable

no bgp scan-rib disable

Parameter Description

Parameter	Description
N/A	N/A

Defaults Timely scan and update is enabled by default.

Command Mode BGP configuration mode/ IPv4/IPv6/VPNv4 address-family configuration mode/ IPv4 VRF address family configuration mode

Usage Guide N/A

Configuration Examples The following example configures the timely scan for the BGP protocol.

```
Orion_B54Q(config-router)# bgp scan-rib disable
```

Related Commands

Command	Description
bgp scan-time	Configures the interval for the BGP timely scan.

Platform
Description None

5.45 bgp scan-time

Use this command to configure the interval for the BGP timely scan. Use the **no** form of this command to restore the default setting.

bgp scan-time *time*

no bgp scan-time [*time*]

Parameter	Description
<i>time</i>	Interval of the timely scan, in the range from 5 to 60 in the unit of seconds

Defaults The default is 60.

Command Mode BGP configuration mode/ IPv4/IPv6/VPNv4 address family configuration mode/ IPv4 address-family VRF configuration mode and IPv6 VRF address family configuration mode.

Usage Guide This command is used to configure the interval for the BGP timely scan; it takes effect when `bgp scan-rib enable` is configured.

Configuration Examples The following example configures the interval for the BGP timely scan.

```
Orion_B54Q(config-router)# bgp scan-time 30
```

Related Commands	Command	Description
	bgp scan-rib enable	Enables timely scan of the routing table by BGP.

Platform
Description None

5.46 bgp tcp-source-check disable

Use this command to configure BGP's TCP source check function. Use **no** form of this command to disable this function.

bgp tcp-source-check disable

no bgp tcp-source-check disable

Parameter	Parameter	Description
	-	-

Defaults This function is enabled by default.

Command BGP configuration mode
Mode

Usage Guide After TCP source check function is disabled, all TCP connection requests will be received. After TCP connection is established, if no neighbor peer is configured on the local device, Notification packet will be send to refuse the BGP connection.

Configuratio The following example configures BGP's TCP source check function.

```
n Examples Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp tcp-source-check disable
```

Configuratio n Examples	Command	Description
		router bgp

Platform N/A
Description

5.47 bgp timer accuracy-control

Use this command to configure BGP's internal timer accuracy control. Use **no** form of this command to restore the default setting.

bgp timer accuracy-control
no bgp timer accuracy-control

Parameter Description	Parameter	Description
		-

Defaults This function is disabled by default.

Command BGP configuration mode
Mode

Usage Guide By default, a deviation from the given time will occur on the BGP protocol's timer to prevent concurrent overtime of many timers. You can use this command to configure BGP protocol's timer to strictly implement the given time. It is recommended disabling this function unless necessary.

Configuratio The following example configures BGP's internal timer accuracy control.

```
n Examples Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# bgp timer accuracy-control
```

Configuratio n Examples	Command	Description
		router bgp

Platform N/A
Description

5.48 bgp update-delay

Use this command to set the maximum delay time of the BGP Speaker before sending the first updating information to neighbors. The **no** form of the command restores it to the default value. During the BGP graceful-restart, this command is used to update the delay time.

bgp update-delay *delay-time*

no bgp update-delay

Parameter
Description

Parameter	Description
<i>delay-time</i>	Maximum delay time of the BGP Speaker before sending its route updating information, in the range from 0 to 3600 in the unit of seconds, 120 seconds by default. For BGP graceful-restart, it is the maximum time of waiting to receive the EOR message of all neighbors, in the range from 1 to 3600 in the unit of seconds.

Defaults The default is 120.

Command

Mode BGP configuration mode

With the BGP starting up, it first waits some time to connect with its neighbors, and then sends the updating message to these neighbors. After connecting with neighbors, the BGP does not send the updating message to them immediately, but waits some time to receive the updating routing message from all neighbors and then performs routing optimization calculation and finally advertises the route updating message to its neighbors, which improves the convergence time and reduces the calculation consumption. If the software sends the route updating information to its neighbors immediately, it may send the information again when it receives more optimized routes from other neighbors.

Usage Guide

The **bgp update-delay** command is used to adjust the initial waiting time of the software, which is the maximum time, from establishing the connection with the first neighbor to performing the routing optimization calculation and sending the route advertisement. When the BGP graceful-restart is enabled, this command is also used to set the maximum waiting time to receive EOR messages from all neighbors. You can increase this value if there are many neighbors or the routing information of the neighbors is huge. If the number of neighbors is 100 and the average amount of routes is 5000, the update sending time that each neighbor completes all the routing is 1 second, then the update of all the routing needs 100 seconds; if the number of neighbors increases to 200, the Update Delay time can be set to 240 seconds, ensuring that all the routing can be updated with the Update Delay period. The specific time is also related to data transmission rate.

The following example sets the update-delay time to 200 seconds.

Configuration

```
Orion_B54Q(config)# router bgp 500
```

Examples

```
Orion_B54Q(config-router)# bgp graceful-restart
Orion_B54Q(config-router)# bgp update-delay 200
```

Related

Command	Description
bgp graceful-restart	Enables the BGP graceful-restart.

Commands

Platform

Description None

5.49 bgp upgrade-cli

Use this command to set the BGP CLI display mode. Use the **no** or **default** form of this command to restore the default setting.

bgp upgrade-cli { af-mode | scope-mode }

no bgp upgrade-cli { af-mode | scope-mode }

default bgp upgrade-cli { af-mode | scope-mode }

Parameter

Parameter	Description
af-mode	CLI is displayed in address family configuration mode.
scope-mode	CLI is displayed in scope configuration mode.

Description

Defaults

The default is **af-mode**. When you execute the **scope** command, the display mode is switched to scope configuration mode automatically.

Command

Mode BGP configuration mode/ BGP scope global configuration mode.

Usage

When the display mode is switched to the scope global configuration mode, all CLI commands will be displayed either in the scope configuration mode or the address-family mode that under the scope configuration mode.

Guide

Configuration

The following example sets the scope global configuration mode as the BGP CLI display mode.

Examples

```
Orion_B54Q(config)# router bgp 500
Orion_B54Q(config-router)# bgp upgrade-cli scope-mode
```

Related

Command	Description
N/A	N/A

Commands

Platform

N/A

Description

5.50 clear bgp all

Use this command to reset all BGP address-families. The content to be reset depends on the further parameters .

clear bgp all [*as number*] [**soft**] [**in** | **out**]

Parameter	Description
<i>none parameter</i>	Resets peer sessions in all address-families.
<i>as-number</i>	Resets sessions with all members in the specified AS. In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new range of the new AS notation is from 1 to 4294967295, represented as 1 to 65535.65535 in dot mode.
in	Soft-resets the received routing information.
out	Soft-resets the redistributed routing information.
soft	Soft-resets all routing information received/sent from/to the specified peer.
soft in	Soft-resets the received routing information.
soft out	Soft-resets the distributed routing information.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage This command is used to reset sessions of all supported address-families, including the vrf
Guide session in every address-family.

Configuration

Examples N/A

Related	Command	Description
Commands	clear bgp ipv4 unicast	Resets the IPv4 unicast address-family.

Platform

Description None

5.51 clear bgp all peer-group

Use this command to reset BGP's specific peer group. The reset content is determined by further

parameters.

clear bgp all peer-group *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description

Parameter	Description
<i>peer-group-name</i>	Resets a specific peer group.
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults

-

Command Mode

Privileged EXEC mode

Usage Guide

This command will reset replies of all supported address families, including reply connection included in vrf in each address family.

Configuration Examples

-

Configuration Examples

Command	Description
clear bgp ipv4 unicast	Resets BGP's IPv4 unicast address families.

Platform

-

Description

5.52 clear bgp ipv4 unicast

Use this command to reset BGP IPv4 unicast address families. The reset content is determined by further parameters.

clear bgp ipv4 unicast [**vrf** *vrf-name*] { * | *as-number* | *peer-address* } [**soft**] [**in** | **out**]

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name
*	Resets all peer group sessions under address families.
<i>as-number</i>	Resets sessions with all members in the specified AS.
<i>peer-address</i>	Resets sessions with the specified peer.
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.

soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide This command is the same as **clear ip bgp** in terms of the function and parameters.

Configuration Examples N/A

Command	Description
N/A	N/A

Platform N/A

Description

5.53 clear bgp ipv4 unicast dampening

Use this command to clear the route flap information and disable route dampening.

clear bgp ipv4 unicast dampening [*address* [*mask*]]

Parameter Description

Parameter	Description
<i>address</i>	IP address
<i>mask</i>	Mask

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command is used to clear the BGP route flap information and disable route dampening. This command can be used to restart the BGP route dampening.

Configuration Examples The following example clears the route flap information and disables route dampening.

```
Orion_B54Q# clear ip bgp dampening 192.168.0.0 255.255.0.0
```

Related Commands

Command	Description
show ip bgp dampening dampened-paths	Displays the dampened routing information.
bgp dampening	Enables the route dampening and sets the dampening parameters.

Platform**Description** None

5.54 clear bgp ipv4 unicast dampening

Use this command to clear the flap information and disable route dampening.

clear bgp ipv4 unicast [vrf *vrf-name*] dampening [*ip-address* [*mask*]]

	Parameter	Description
Parameter Description	<i>vrf-name</i>	VRF name.
	-	Clears the flap information of all routes.
	<i>address</i>	IP address
	<i>mask</i>	Mask

Defaults N/A**Command****Mode** Privileged EXEC mode**Usage** This command is used to clear the BGP route dampening information and release suppressed**Guide** routes. This command can be used to restart the BGP route dampening.**Configuration** The following example clears the flap information and disables route dampening.**Examples** Orion_B54Q# clear ip bgp dampening 192.168.0.0 255.255.0.0

	Command	Description
Related Commands	show ip bgp dampening dampened-paths	Displays the suppressed routing information.
	bgp dampening	Enables the route dampening and sets the dampening parameters.

Platform**Description** None

5.55 clear bgp ipv4 unicast external

Use this command to reset all EBGp connections.

clear bgp ipv4 unicast [vrf *vrf-name*] external [*soft*] [*in* | *out*]

	Parameter	Description
Parameter Description	<i>vrf-name</i>	VRF name.
	in	Without parameter soft, resets the session of the peer to establish

	active connection.
out	Without parameter soft, resets the session of the local BGP speaker to establish active connection.
soft	Soft-resets all routing information received/sent from/to the specified peer.
soft in	Soft-resets the received routing information.
soft out	Soft-resets the distributed routing information.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to reset the specified external BGP connection.

Configuration The following example resets all EBGp connections.

Examples Orion_B54Q# clear bgp ipv4 unicast external in

Command	Description
clear ip bgp	Resets the BGP session.
show ip bgp neighbors	Displays the neighbor information.

Related Commands

Platform

Description None

5.56 clear bgp ipv4 unicast flap-statistics

Use this command to clear the route flap information.

clear bgp ipv4 unicast [vrf *vrf-name*] flap-statistics [*address* [*mask*]]

Parameter	Description
<i>vrf-name</i>	VRF name.
-	Clears all route flap information
<i>address</i>	IP address
<i>mask</i>	Mask

Parameter Description

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command can be used only to clear the statistics of unsuppressed routes. It does not release the suppressed routes. To clear all route statistics and release the suppressed routes, run the **clear ip bgp dampening** command.

Configuration Examples The following example clears the route flap information.

```
Orion_B54Q# clear bgp ipv4 unicast flap-statistics
```

Related Commands	Command	Description
	bgp dampening	Enables the route dampening function and sets dampening parameters.
	show ip bgp	Displays the BGP route entry.

Platform Description None

5.57 clear bgp ipv4 unicast peer-group

Use this command to reset the session with all members in the peer group.

clear bgp ipv4 unicast [vrf vrf-name] peer-group peer-group-name [soft] [in | out]

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name
	<i>peer-group-name</i>	Name of the peer group
	in	Without parameter soft, resets the session of the peer to establish active connection.
	out	Without parameter soft, resets the session of the local BGP speaker to establish active connection.
	soft	Soft-resets all routing information received/sent from/to the specified peer.
	soft in	Soft-resets for the received routing information.
	soft out	Soft-resets the distributed routing information.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command resets the BGP session with all members in the peer group.

Configuration Examples The following example resets the session with all members in the peer group.

```
Orion_B54Q# clear bgp ipv4 unicast peer-group my-group in
```

**Related
Commands**

Command	Description
clear ip bgp	Resets the BGP session.
show ip bgp	Displays the BGP route entry.

Platform

Description None

5.58 clear bgp ipv4 unicast table-map

Use this command to update the table-map setting under the IPv4 unicast address family of BGP.

clear bgp ipv4 unicast [vrf *vrf-name*] table-map

**Parameter
Description**

Parameter	Description
<i>vrf-name</i>	VRF name

Defaults -

**Command
Mode** Privileged EXEC mode

Usage Guide Re-apply table-map setting and update allocated core route table information.

**Configuratio
n Examples** -

**Parameter
Description**

Command	Description
clear ip bgp	Resets BGP's IPv4 unicast address families.

**Platform
Description** -

5.59 clear bgp ipv6 unicast

Use this command to reset BGP's IPv6 unicast address families.

clear bgp ipv6 unicast [vrf *vrf-name*] { * | *as-number* | *peer-address* } [soft] [in | out]

**Parameter
Description**

Parameter	Description
<i>vrf-name</i>	VRF name
*	Resets all peer group sessions under address families.
<i>as-number</i>	Resets sessions with all members in the specified AS.

	In 10.4(3) or a later version, adds support for 4-byte AS numbers. The new AS number ranges from 1 to 4294967295, or 1 and 65535.65535 in the dotted mode.
<i>peer-address</i>	Resets sessions with the specified peer.
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide The function is similar with **clear bgp ipv4 unicast**, but applies to different address families.

Configuration Examples -

Configuration Examples	Command	Description
	clear bgp ipv4 unicast	Resets BGP's IPv4 unicast address families.

Platform Description -

5.60 clear bgp ipv6 unicast dampening

Use this command to clear flap information and disable route dampening.

clear bgp ipv6 unicast [vrf vrf-name] dampening [ip-address [mask]]

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name
	-	Clears all routes' flap information.
	<i>ip-address</i>	IP address
	<i>mask</i>	Mask code

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to clear BGP's route flap information and disable route dampening. The command can restart BGP's route flap.

Configuration Examples The following example clears flap information and disables route dampening.

```
Orion_B54Q# clear bgp ipv6 unicast dampening 192.168.0.0 255.255.0.0
```

Configuration Examples

Command	Description
bgp dampening	Enables the route dampening function and sets dampening parameters.

Platform Description -

5.61 clear bgp ipv6 unicast external

Use this command to reset all EBGp connection of IPv6 unicast address families.

```
clear bgp ipv6 unicast [ vrf vrf-name ] external [ soft ] [ in | out ]
```

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to reset all the specified external BGP connection.

Configuration Examples The following example resets all EBGp connection of IPv6 unicast address families.

```
Orion_B54Q# clear bgp ipv6 unicast external in
```

Configuration Examples

Command	Description
clear ip bgp	Resets BGP sessions.
show ip bgp neighbors	Displays BGP neighbors' information.

Platform Description -

5.62 clear bgp ipv6 unicast flap-statistics

Use this command to clear IPv6 unicast address families' route flap statistics.

clear bgp ipv6 unicast [*vrf vrf-name*] **flap-statistics** [*address* [*mask*]]

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name
-	Clears all route information's flap information.
<i>address</i>	IP address
<i>mask</i>	Mask code

Defaults

-

Command Mode

Privileged EXEC mode

Usage Guide

This command can only clear statistics of routes that are not damped and will not relieve damped routes. To clear statistics of all route information and relieve damped routes, use the **clear bgp ipv4 unicast dampening** command.

Configuration Examples

The following example clears IPv6 unicast address families' route flap statistics.

```
Orion_B54Q# clear bgp ipv6 unicast flap-statistics
```

Configuration Examples

Command	Description
bgp dampening	Enables the route dampening function and sets dampening parameters.
show ip bgp	Displays BGP route entries.

Platform

-

Description

5.63 clear bgp ipv6 unicast peer-group

Use this command to reset sessions with all members in the peer group.

clear bgp ipv6 unicast [*vrf vrf-name*] **peer-group** *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name
<i>peer-group-name</i>	Peer group name
in	Soft-resets received route information.
out	Soft-resets allocated route information.

soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Privileged EXEC mode

Mode

Usage Guide Use this command to reset BGP sessions with all members in the peer group.

Configuration Examples The following example resets sessions with all members in the peer group.

Configuration Examples Orion_B54Q# clear bgp ipv6 unicast peer-group my-group in

Configuration Examples

Command	Description
clear ip bgp	Resets BGP sessions.
show ip bgp	Displays BGP route entries.

Platform -

Description

5.64 clear bgp ipv6 unicast table-map

Use this command to update the table-map setting under the IPv6 unicast address family of BGP.

clear bgp ipv6 unicast [vrf *vrf-name*] table-map

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name

Defaults -

Command Mode Privileged EXEC mode

Usage Guide -

Configuration Examples -

Configuration Examples	Command	Description
	clear ip bgp	Resets BGP's IPv4 unicast address families.

Platform Description -

5.65 clear bgp l2vpn vpls

Use this command to reset BGP's VPLS address families.

clear bgp l2vpn vpls { * | *as-number* | *peer-address* } [**soft] [**in** | **out**]**

Parameter Description	Parameter	Description
	*	Resets all peer group sessions under address families.
	<i>as-number</i>	Resets sessions with all members in the specified AS. In 10.4(3) or a later version, adds support for 4-byte AS numbers. The new AS number ranges from 1 to 4294967295, or 1 and 65535.65535 in the dotted mode.
	<i>peer-address</i>	Resets sessions with the specified peer.
	in	Soft-resets received route information.
	out	Soft-resets allocated route information.
	soft	Soft-resets received and sent route information.
	soft in	Soft-resets received route information.

soft out	Soft-resets allocated route information.
-----------------	--

Defaults -

Command Mode Privileged EXEC mode

Usage Guide The function is similar with **clear bgp ipv4 unicast**, but applies to different address families.

Configuration Examples -

Configuration Examples	Command	Description
	clear bgp ipv4 unicast	Resets BGP's IPv4 unicast address families.

Platform Description -

5.66 clear bgp l2vpn vpls dampening

Use this command to clear flap information and disable route dampening.

clear bgp l2vpn vpls dampening [*ve_id:offset*]

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>ve_id:offset</i>	Clears specified <i>ve_id:offset</i> 's vfi instance route flap information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to clear BGP's route flap information and relieve damped routes. The command can restart BGP's route flap.

Configuration Examples The following example clears flap information and disables route dampening.

```
Orion_B54Q# clear bgp l2vpn vpls dampening
```

Configuration Examples	Command	Description
	bgp dampening	Enables the route dampening function and sets dampening parameters.

Platform -

Description

5.67 clear bgp l2vpn vpls external

Use this command to reset all EBGp connection of BGP VPLS address families.

clear bgp l2vpn vpls external [soft] [in | out]

Parameter Description	Parameter	Description
	in	Soft-resets received route information.
	out	Soft-resets allocated route information.
	soft	Soft-resets received and sent route information.
	soft in	Soft-resets received route information.
	soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to reset all the specified external BGP connection.

Configuration Examples The following example resets all EBGp connection of BGP VPLS address families.

```
Orion_B54Q# clear bgp l2vpn vpls external in
```

Configuration Examples	Command	Description
	clear ip bgp	Resets BGP sessions.
	show ip bgp neighbors	Displays BGP neighbors' information.

Platform -

Description

5.68 clear bgp l2vpn vpls flap-statistics

Use this command to clear BGP VPLS address families' route flap statistics.

clear bgp l2vpn vpls flap-statistics [*ve_id:offset*]

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>ve_id:offset</i>	Clears specified <i>ve_id:offset</i> 's vfi instance route flap information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide This command can only clear statistics of routes that are not damped and will not relieve damped routes. To clear statistics of all route information and relieve damped routes, use the **clear bgp l2vpn vpls dampening** command.

Configuration Examples The following example clears BGP VPLS address families' route flap statistics.

```
Orion_B54Q# clear bgp l2vpn vpls flap-statistics
```

Configuration Examples	Command	Description
	bgp dampening	Enables the route dampening function and sets dampening parameters.
	show ip bgp	Displays BGP route entries.

Platform -

Description

5.69 clear bgp l2vpn vpls peer-group

Use this command to reset sessions with all members in the peer group.

clear bgp l2vpn vpls peer-group *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description	Parameter	Description
	<i>peer-group-name</i>	Peer group name
	in	Soft-resets received route information.
	out	Soft-resets allocated route information.
	soft	Soft-resets received and sent route information.
	soft in	Soft-resets received route information.
	soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide Use this command to reset BGP sessions with all members in the peer group.

Configuration Examples The following example resets sessions with all members in the peer group.

```
Orion_B54Q# clear bgp l2vpn vpls peer-group my-group in
```

Configuration Examples

Command	Description
<code>clear ip bgp</code>	Resets BGP sessions.
<code>show ip bgp</code>	Displays BGP route entries.

Platform -

Description

5.70 clear bgp l2vpn vpws

Use this command to reset BGP's VPWS address families.

```
clear bgp l2vpn vpws { * | as-number | peer-address } [ soft ] [ in | out ]
```

Parameter Description

Parameter	Description
<code>*</code>	Resets all peer group sessions under address families.
<code>as-number</code>	Resets sessions with all members in the specified AS. In 10.4(3) or a later version, adds support for 4-byte AS numbers. The new AS number ranges from 1 to 4294967295, or 1 and 65535.65535 in the dotted mode.
<code>peer-address</code>	Resets sessions with the specified peer.
<code>in</code>	Soft-resets received route information.
<code>out</code>	Soft-resets allocated route information.
<code>soft</code>	Soft-resets received and sent route information.
<code>soft in</code>	Soft-resets received route information.
<code>soft out</code>	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide The function is similar with `clear bgp ipv4 unicast`, but applies to different address families.

Configuration -

n Examples

Configuration Examples	Command	Description
	<code>clear bgp ipv4 unicast</code>	Resets BGP's IPv4 unicast address families.

Platform -
Description

5.71 clear bgp l2vpn vpws dampening

Use this command to clear flap information and disable route dampening.

`clear bgp l2vpn vpws dampening [ve_id:offset]`

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>ve_id:offset</i>	Clears specified <i>ve_id:offset</i> 's vfi instance route flap information.

Defaults -

Command Privileged EXEC mode
Mode

Usage Guide You can use this command to clear BGP's route flap information and relieve damped routes. The command can restart BGP's route flap.

Configuration Examples The following example clears flap information and disables route dampening.

```
Orion_B54Q# clear bgp l2vpn vpws dampening
```

Configuration Examples	Command	Description
	<code>bgp dampening</code>	Enables the route dampening function and sets dampening parameters.

Platform -
Description

5.72 clear bgp l2vpn vpws external

Use this command to reset all EBGp connection of BGP VPWS address families.

`clear bgp l2vpn vpws external [soft] [in | out]`

Parameter Description	Parameter	Description
	<code>in</code>	Soft-resets received route information.

out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to reset all the specified external BGP connection.

Configuration Examples The following example resets all EBGp connection of BGP VPWS address families.

```
Orion_B54Q# clear bgp l2vpn vpws external in
```

Configuration Examples	Command	Description
	clear ip bgp	Resets BGP sessions.
	show ip bgp neighbors	Displays BGP neighbors' information.

Platform -

Description

5.73 clear bgp l2vpn vpws flap-statistics

Use this command to clear BGP VPWS address families' route flap statistics.

```
clear bgp l2vpn vpws flap-statistics [ ve_id:offset ]
```

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>ve_id:offset</i>	Clears specified <i>ve_id:offset</i> 's vfi instance route flap information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide This command can only clear statistics of routes that are not damped and will not relieve damped routes. To clear statistics of all route information and relieve damped routes, use the **clear bgp l2vpn vpws dampening** command.

Configuration Examples The following example clears BGP VPWS address families' route flap statistics.

```
Orion_B54Q# clear bgp l2vpn vpws flap-statistics
```

Configuration Examples	Command	Description
------------------------	---------	-------------

bgp dampening	Enables the route dampening function and sets dampening parameters.
show ip bgp	Displays BGP route entries.

Platform -
Description

5.74 clear bgp l2vpn vpws peer-group

Use this command to reset sessions with all members in the peer group.

clear bgp l2vpn vpws peer-group *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description	Parameter	Description
	<i>peer-group-name</i>	Peer group name
	in	Soft-resets received route information.
	out	Soft-resets allocated route information.
	soft	Soft-resets received and sent route information.
	soft in	Soft-resets received route information.
	soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide Use this command to reset BGP sessions with all members in the peer group.

Configuration Examples The following example resets sessions with all members in the peer group.

```
Orion_B54Q# clear bgp l2vpn vpws peer-group my-group in
```

Configuration Examples	Command	Description
	clear ip bgp	Resets BGP sessions.
	show ip bgp	Displays BGP route entries.

Platform -
Description

5.75 clear bgp vpnv4 unicast

Use this command to reset BGP's VPNV4 unicast address families.

clear bgp vpnv4 unicast { * | *as-number* | *peer-address* } [**soft**] [**in** | **out**]

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
*	Resets all peer group sessions under address families.
<i>as-number</i>	Resets sessions with all members in the specified AS. In 10.4(3) or a later version, adds support for 4-byte AS numbers. The new AS number ranges from 1 to 4294967295, or 1 and 65535.65535 in the dotted mode.
<i>peer-address</i>	Resets sessions with the specified peer.
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide The function is similar with **clear bgp ipv4 unicast**, but applies to different address families.

Configuration Examples -

Configuration Examples	Command	Description
	clear bgp ipv4 unicast	Resets BGP's IPv4 unicast address families.

Platform Description -

5.76 clear bgp vpnv4 unicast dampening

Use this command to clear flap information and disable route dampening.

clear bgp vpnv4 unicast dampening [*ip-address* [*mask*]]

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>ip-address</i>	IP address
	<i>mask</i>	Mask code

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to clear BGP's route flap information and relieve damped routes. The command can restart BGP's route flap.

Configuration Examples The following example clears flap information and disables route dampening.

```
Orion_B54Q# clear bgp vpnv4 unicast dampening
```

Configuration Examples

Command	Description
bgp dampening	Enables the route dampening function and sets dampening parameters.

Platform -

Description

5.77 clear bgp vpnv4 unicast external

Use this command to reset all EBGP connection of VPNv4 address families.

clear bgp vpnv4 unicast external [soft] [in | out]

Parameter Description

Parameter	Description
in	Soft-resets received route information.
out	Soft-resets allocated route information.
soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide You can use this command to reset all the specified external BGP connection.

Configuration Examples The following example resets all EBGP connection of VPNv4 address families.

```
Orion_B54Q# clear bgp vpnv4 unicast external in
```

Configuration Examples

Command	Description
clear ip bgp	Resets BGP sessions.
show ip bgp neighbors	Displays BGP neighbors' information.

Platform -

Description

5.78 clear bgp vpnv4 unicast flap-statistics

Use this command to clear VPNv4 address families' route flap statistics.

clear bgp vpnv4 unicast flap-statistics [*address* [*mask*]]

Parameter Description	Parameter	Description
	-	Clears all routes' flap information.
	<i>address</i>	IP address
	<i>mask</i>	Mask code

Defaults -

Command Mode Privileged EXEC mode

Usage Guide This command can only clear statistics of routes that are not damped and will not relieve damped routes. To clear statistics of all route information and relieve damped routes, use the **clear bgp vpnv4 unicast dampening** command.

Configuration Examples The following example clears VPNv4 address families' route flap statistics.

```
Orion_B54Q# clear bgp vpnv4 unicast flap-statistics
```

Configuration Examples	Command	Description
	bgp dampening	Enables the route dampening function and sets dampening parameters.
	show ip bgp	Displays BGP route entries.

Platform -

Description

5.79 clear bgp vpnv4 unicast peer-group

Use this command to reset sessions with all members in the peer group.

clear bgp vpnv4 unicast peer-group *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description	Parameter	Description
	<i>peer-group-name</i>	Peer group name
	in	Soft-resets received route information.
	out	Soft-resets allocated route information.

soft	Soft-resets received and sent route information.
soft in	Soft-resets received route information.
soft out	Soft-resets allocated route information.

Defaults -

Command Privileged EXEC mode

Mode

Usage Guide Use this command to reset BGP sessions with all members in the peer group.

Configuration Examples The following example resets sessions with all members in the peer group.

```
Orion_B54Q# clear bgp vpnv4 unicast peer-group my-group in
```

Configuration Examples

Command	Description
clear ip bgp	Resets BGP sessions.
show ip bgp	Displays BGP route entries.

Platform -

Description

5.80 clear bgp vpnv6 unicast

Use this command to reset BGP's VPNv6 unicast address families.

```
clear bgp vpnv6 unicast { * | as-number | peer-address } [ soft ] [ in | out ]
```

Parameter Description

Parameter	Description
*	Resets all peer group sessions under address families.
<i>as-number</i>	Resets sessions with all members in the specified AS. In 10.4(3) or a later version, the device supports 4-byte AS number. The new AS number ranges from 1 to 4294967295, or from 1 to 65535.65535 in the dotted mode.
<i>peer-address</i>	Resets sessions with the specified peer.
in	Soft-resets the received route information.
out	Soft-resets the allocated route information.
soft	Soft-resets the received and sent route information.
soft in	Soft-resets the received route information.
soft out	Soft-resets the allocated route information.

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide This command is similar to the **clear bgp ipv4 unicast** command.

Configuration Examples N/A

Configuration Examples	Command	Description
	N/A	N/A

Platform Description N/A

5.81 clear bgp vpnv6 unicast dampening

Use this command to clear flap information and disable route dampening.

clear bgp vpnv6 unicast dampening

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide You can use this command to clear BGP's route flap information and disable route dampening. The command can restart BGP's route flap.

Configuration Examples The following example s clears BGP's route flap information and disables route dampening.

```
Orion_B54Q# clear bgp vpnv6 unicast dampening
```

Configuration Examples	Command	Description
	N/A	N/A

Platform Description N/A

5.82 clear bgp vpnv6 unicast external

Use this command to reset all EBGP connection of VPNv6 address family.

clear bgp vpnv6 unicast external [soft] [in | out]

Parameter Description	Parameter	Description

-	Resets all BGP session.
in	Resets the received route information.
out	Resets the allocated route information.
soft	Soft-resets the received and sent route information.
soft in	Soft-resets the received route information.
soft out	Soft-resets the allocated route information.

Defaults -

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example resets all EBGp connection of VPNv6 address family.

```
Orion_B54Q# clear bgp vpnv6 unicast external in
```

Configuration Examples	Command	Description
	N/A	N/A

Platform Description N/A

5.83 clear bgp vpnv6 unicast flap-statistics

Use this command to clear VPNv6 address family's route flap statistics.

clear bgp vpnv6 unicast flap-statistics

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command clears only statistics of routes that are not dampened and does not disable route dampening. If you want to clear all route statistics and disable route dampening, use the **clear bgp vpnv6 unicast dampening** command.

Configuration Examples The following example clears VPNv6 address family's route flap statistics.

```
Orion_B54Q# clear bgp vpnv6 unicast flap-statistics
```

Configuration	Command	Description
---------------	---------	-------------

n Examples

N/A	N/A
-----	-----

Platform

N/A

Description

5.84 clear bgp vpnv6 unicast peer-group

Use this command to reset sessions with all members in the peer group.

clear bgp vpnv6 unicast peer-group *peer-group-name* [**soft**] [**in** | **out**]

Parameter Description

Parameter	Description
<i>peer-group-name</i>	Peer group name
in	Resets the received route information.
out	Resets the allocated route information.
soft	Soft-resets the received and sent route information.
soft in	Soft-resets the received route information.
soft out	Soft-resets the allocated route information.

Defaults

N/A

Command

Privileged EXEC mode

Mode**Usage Guide**

Use this command to reset BGP sessions with all members in the peer group.

Configuration Examples

The following example resets the received route information with all members in the peer group called **my-group**.

```
Orion_B54Q# clear bgp vpnv4 unicast peer-group my-group in
```

Configuration Examples

Command	Description
N/A	N/A

Platform

N/A

Description

5.85 clear ip bgp

Use this command to reset the BGP session.

clear ip bgp [**vrf** *vrf-name*] { * | *as-number* | *peer-address* } [**soft**] [**in** | **out**]

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name.

*	Resets all the current BGP sessions and the OVERFLOW status of BGP ipv4 unicast address family.
address	Resets the BGP session with the specified peer.
as number	Resets sessions with all members in the specified AS. In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new range of the new AS notation is from 1 to 4294967295, represented as 1 to 65535.65535 in dot mode.
in	Soft-reset the received routing information.
out	Soft-reset the redistributed routing information.
soft	Soft-reset all routing information received/sent from/to the specified peer
soft in	Soft-reset the received routing information.
soft out	Soft-reset the distributed routing information.

Defaults N/A

Command

Mode Privileged EXEC mode

At any time, once the routing policy or BGP configuration changes, an effective way must be available to implement the new routing policy or configuration. Traditional measure is to close the BGP connection and establish a new one.

This product supports implementing a new routing strategy without closing the BGP session connection by soft-resetting BGP.

Usage Guide

For the peer that does not support the route refresh function, you may run the **neighbor soft-reconfiguration inbound** command to keep a copy of original routing information of every specified BGP peer on the local BGP speaker. This will consume some resources.

You can use the **show ip bgp neighbors** command to see whether the BGP peer supports the route refresh function. If it is supported, you need not to execute the **neighbor soft-reconfiguration inbound** command when the inbound routing strategy changes.

- i All connected BGP routers must support the route refresh function to execute this command. This product supports the route refresh function.

Configuration Examples The following example resets the BGP session.

```
Orion_B54Q# clear bgp ipv4 unicast *
```

Related Commands

Command	Description
neighbor soft-reconfiguration inbound	(Optional) Restarts the BGP session and reserves the unchanged route information sent by the BGP peer (group).

Related Commands	Command	Description
	show ip bgp	Displays the BGP route entry.

Platform
Description None

5.86 clear ip bgp dampening

Use this command to clear the dampening information and disable route dampening.

clear ip bgp [vrf vrf-name] dampening [ip-address [mask]]

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name
	<i>address</i>	IP address
	<i>mask</i>	Mask

Defaults N/A

Command
Mode Privileged EXEC mode

Usage This command is used to clear the BGP route flap information and disable route dampening. This command can be used to restart BGP route dampening.
Guide

Configuration The following example clears the dampening information and disables route dampening.

Examples

```
Orion_B54Q# clear ip bgp dampening 192.168.0.0 255.255.0.0
```

Related Commands	Command	Description
	show ip bgp dampening dampened-paths	Displays the suppressed routing information.
	bgp dampening	Enables the route dampening function and sets dampening parameters.

Platform
Description None

5.87 clear ip bgp external

Use this command to reset all EBGP connections.

clear ip bgp [vrf vrf-name] external [soft] [in | out]

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name.

in	Without parameter soft, resets the session through which the peer establishes active connection.
out	Without parameter soft, resets the session through which the local BGP speaker establishes active connection.
soft in	Soft-resets the received routing information.
soft out	Soft-resets the distributed routing information.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to reset the specified external BGP connection.

Configuration The following example resets all EBGP connections.

Examples

```
Orion_B54Q# clear ip bgp external in
```

	Command	Description
Related Commands	clear ip bgp	Resets the BGP session.
	show ip bgp neighbors	Displays the neighbor information.

Platform

Description None

5.88 clear ip bgp flap-statistics

Use this command to clear the routes vibration statistics of the IPv4 unicast address family.

clear ip bgp [vrf vrf-name] flap-statistics [ip-address [mask]]

	Parameter	Description
Parameter Description	<i>vrf-name</i>	VRF name.
	<i>address</i>	IP address
	<i>Mask</i>	Mask

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command can be used only to clear statistics of unsuppressed routes. It does not release the suppressed routes. To clear all route statistics and release the suppressed routes, run the **clear ip**

bgp dampening command.

Configuration The following example clears the routes vibration statistics of the IPv4 unicast address family.

Examples Orion_B54Q# clear ip bgp flap-statistics

	Command	Description
Related Commands	bgp dampening	Enables the route dampening function and sets dampening parameters.
	show ip bgp	Displays the BGP route entry.

Platform

Description None

5.89 clear ip bgp peer-group

Use this command to reset the session with all members in the peer group.

clear ip bgp [vrf *vrf-name*] peer-group *peer-group-name* [soft] [in | out]

	Parameter	Description
Parameter Description	<i>vrf-name</i>	VRF name.
	<i>peer-group-name</i>	Name of the peer group
	in	Without parameter soft , resets the session through which the peer establishes active connection.
	out	Without parameter soft , resets the session through which the local BGP speaker establishes active connection.
	soft	Soft-resets all routing information received/sent from/to the specified peer
	soft in	Soft-resets the received routing information.
	soft out	Soft-resets the distributed routing information.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command resets the BGP session with all members in the peer group.

Configuration The following example resets the session with all members in the peer group.

Examples Orion_B54Q# clear ip bgp peer-group my-group in

	Command	Description
Related Commands	clear ip bgp	Resets the BGP session.

Related Commands	Command	Description
	show ip bgp	Displays the BGP route entry.

Platform

Description None

5.90 clear ip bgp table-map

Use this command to update the table-map's route information applied by IPv4 unicast address family.

clear ip bgp [vrf vrf-name] table-map

Parameter	Parameter	Description
Description	<i>vrf-name</i>	vrf name

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to update the route information of the applied table-map.

Configuration

The following example updates the table-map's route information applied by IPv4 unicast address family.

Examples

```
Orion_B54Q# clear ip bgp table-map
```

Related Commands	Command	Description
	clear ip bgp	Resets the BGP session.
	show ip bgp	Displays the BGP route entry.

Platform

Description None

5.91 default-information originate

Use this command to enable BGP to distribute the default route. Use the **no** form of this command to restore the default setting.

default-information originate

[no] default-information originate

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is disabled by default.

Command Mode BGP configuration mode, BGP IPv4/IPv6 address family configuration mode, BGP IPv4 VRF configuration mode, BGP IPv6 VRF configuration mode

Usage Guide This command is used to control whether the redistributed default route is effective, and this command needs to be configured together with the **redistribute** command. It takes effect only when a default route exists in the redistributed route.

This command is similar to the **network** command. The difference is that in the process of configuring the former, the **redistribute** command must be configured explicitly to redistribute the default route, only in this case, the redistributed default route is effective. For the later command, the IGP must have the default route.

Configuration Examples The following example enables BGP to distribute the default route.

```
Orion_B54Q(config-router)# default-information originate
```

Related Commands	Command	Description
	network	Configures routes to be advertised.
	redistribute	Redistributes routes of other protocol.

Platform Description None

5.92 default-metric

Use this command to set the metric for route redistribution. Use the **no** form of this command to restore the default setting.

default-metric *number*


no default-metric

Parameter	Parameter	Description
Description	<i>number</i>	Metric number, in the range from 1 to 4294967295

Defaults No metric is set by default.

Command Mode BGP configuration mode and various address-family configuration modes

This command sets the metric of routes to be redistributed for integrity.

Usage Guide  The metric set by the command cannot cover that set by the **redistribute metric** command. The value is 0 when the default metric applies to redistributed connected routes.

Configuration The following example sets the metric for route redistribution.

Examples

```
Orion_B54Q(config-router)# default-metric 45
```

Related Commands	Command	Description
	redistribute	Redistributes routes of other protocol.

Platform

Description None

5.93 distance bgp

Use this command to set different management distances for different types of BGP routes. Use the **no** form of this command to restore the default setting.

distance bgp *external-distance internal-distance local-distance*

no distance bgp

Parameter	Description
<i>external-distance</i>	Route management distance learned from EBGP peers, in the range from 1 to 255
<i>internal-distance</i>	Route management distance learned from IBGP peers, in the range from 1 to 255
<i>local-distance</i>	Specifies the management distance of route learned from peers. However, the optimal one can be learned from the IGP. In general, these routes are indicated by the Network Backdoor command. The value is in the range from 1 to 255

Defaults The parameter defaults are as follows:

external-distance - 20

internal-distance - 200

local-distance - 200

Command Mode BGP configuration mode, BGP IPv4 unicast address family configuration mode, BGP IPv4 multicast address family configuration mode, BGP IPv4 VRF configuration mode, BGP IPv6 VRF configuration mode, BGP IPv6 unicast address family configuration mode, BGP IPv6 multicast address family configuration mode.

Usage Guide It is not recommended to change the management distance of the BGP route. If it is necessary, observe the following points:

- The management distance of "external-distance" must be shorter than those of other IGP routing protocols (such as OSPF and RIP);

- The internal-distance and local-distance should have longer management distances than other IGP routing protocols.

Configuration The following example sets different management distances for different types of BGP routes.

Examples `Orion_B54Q(config-router)# distance bgp 20 20 200`

	Command	Description
Related Commands	neighbor soft-reconfiguration inbound	Restarts the BGP session and reserves the unchanged route information sent by the BGP peer (group).
	show ip bgp	Displays the BGP route entry.

Platform

Description None

5.94 exit-address-family

Use this command to exit BGP address-family configuration mode.

exit-address-family

	Parameter	Description
Parameter Description	N/A	N/A

Defaults N/A

Command

Mode BGP address-family configuration mode

Usage Guide This command can be used to exit from various address-family modes of BGP to BGP configuration mode.

Configuration The following example exits the BGP address-family configuration mode.

Examples `Orion_B54Q(config-router-af)#exit-address-family`

	Command	Description
Related Commands	address-family ipv4	Enters IPv4 address family configuration mode.

Platform

Description None

5.95 maximum-paths ebgp

Use this command to configure the number of cost-equal paths for the EBGp multipathing load balancing function. Use the **no** form of this command to restore the default setting.

maximum-paths ebgp *number*

no maximum-paths ebgp

Parameter Description

Parameter	Description
<i>number</i>	Maximum number of cost-equal paths The parameter value ranges from 1 to 32. When the parameter is set to 1, the EBGp multipathing load balancing function is disabled.

Defaults

EBGp multipathing load balancing is disabled by default.

Command Mode

BGP configuration mode/ BGP IPv4 unicast address configuration mode/ BGP IPv6 unicast address-family configuration mode/ BGP scope global configuration mode

Usage Guide

When EBGp ECMP must be supported, run the maximum-paths ebgp command to configure the maximum number of cost-equal paths. The command also applies to EBGp ECMP in the confederation.

Configuration Examples

The following example configures the number of cost-equal paths for the EBGp multipathing load balancing function.

```
Orion_B54Q(config)# router bgp 65530
Orion_B54Q(config-router)# maximum-paths ebgp 2
```

Related Commands

Command	Description
router bgp	Enables BGP.
show ip bgp	Displays BGP routing entries.

Platform

N/A

Description

5.96 maximum-paths ibgp

Use this command to configure the number of cost-equal paths for the IBGp multipathing load balancing function. Use the **no** form of this command to disable the IBGp multipathing load balancing function.

maximum-paths ibgp *number*

no maximum-paths ibgp

Parameter

Parameter	Description
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Description	<i>number</i>	Maximum number of cost-equal paths The parameter value ranges from 1 to 32. When the parameter is set to 1, the IBGP multipathing load balancing function is disabled.
--------------------	---------------	---

Defaults This function is disabled by default.

Command Mode BGP configuration mode/ BGP IPv4 address-family configuration mode/ BGP IPv6 address-family configuration mode

Usage Guide When IBGP ECMP must be supported, run the maximum-paths ibgp command to configure the maximum number of cost-equal paths.

Configuration Examples The following example configures the number of cost-equal paths for the IBGP multipathing load balancing function.

```
Orion_B54Q(config)# router bgp 65530
Orion_B54Q(config-router)# maximum-paths ibgp 2
```

Related Commands	Command	Description
	router bgp	Enables BGP.
	show ip bgp	Displays BGP routing entries.

Platform N/A

Description

5.97 maximum-prefix

Use this command to limit the maximum number of prefixes in the routing database in the address family. Use the **no** form of this command to restore the default setting.

maximum-prefix *maximum*

no maximum-prefix [*maximum*]

Parameter Description	Parameter	Description
	<i>maximum</i>	The maximum number of prefixes in the routing database in the address family, in the range from 1 to 4294967295
	no	Restores the default maximum number.

The default maximum numbers of prefixes in the routing database vary with address families. The default number in the IPv4 VRF, IPv6 VRF, IPv4 Multicast, IPv6 Multicast, IPv4 MDT address family is 10000; The default number in the other address family is 4294967295.

Defaults

Command Mode BGP configuration mode/ BGP IPv4 address family configuration mode/ BGP IPv4 VRF configuration mode/ BGP IPv6 VRF configuration mode, BGP VPNv4 configuration mode/ BGP IPv4 MDT address family mode

In a BGP address family, routing prefixes may be introduced through redistribution or learnt from neighbors, or other VRFs. Once routing prefixes in the BGP address family reaches the maximum number, this address family will enter to the overflow state.

Use the **show bgp { addressfamily | all } summary** command to display the state of routing database.

It is necessary to reconfigure BGP for state clearing, or use the **clear bgp { addressfamily | all } *** command to reset the address family.

- When the address family is overflow as the number of prefixes reaches the maximum number, you can adjust maximum-prefix.

Usage Guide

- Maximum-prefix will not filter the routing information generated by the network and aggregate commands.

IPv4 unicast routes can receive the routing prefix in the following conditions even in the Overflow state:

The route information of the same routing prefix exists in the address database.

One route that overwrites this prefix (except for the default route) exists in the address database and the next-hop of this route is different from that of the newly received routing prefix.

The following example sets the maximum number of prefixes in the BGP routing database in the ipv4 multicast address family.

Configuration Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# address-family ipv4 multicast
Orion_B54Q(config-router-af)# maximum-prefix 65535
```

Related Commands

Command	Description
clear bgp all	Resets BGP's all address families.
clear bgp ipv4 mdt	Resets BGP's ipv4 mdt address families.
clear bgp ipv4 unicast	Resets BGP's ipv4 unicast address families.
clear bgp ipv6 unicast	Resets BGP's ipv6 unicast address families.
clear bgp vpnv4 unicast	Resets BGP's vpnv4 unicast address families.
show bgp all summary	Displays summary of BGP's all address families.
show bgp ipv4 mdt summary	Displays summary of BGP's ipv4 mdt address families.
show bgp ipv4 unicast summary	Displays summary of BGP's ipv4 unicast address families.
show bgp ipv6 unicast summary	Displays summary of BGP's ipv6 unicast address families.
show bgp vpnv4 summary	Displays summary of BGP's vpnv4 unicast address families.

Platform
Description N/A

5.98 neighbor activate

Use this command to activate the neighbor or peer group in the current address mode. Use the **no** form of this command to disable this function.

neighbor {*peer-address* | *peer-group-name*} **activate**
no neighbor {*peer-address* | *peer-group-name*} **activate**

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 address or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults This function is enabled in IPv4 address family mode by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode / address-family VPNv4 configuration mode

Usage Guide The function is enabled by default for IPv4 address families. You need to set this command in other address-family configuration modes for exchanging routes.

The following example activates the neighbor or peer group in the current address mode.

Configuration Examples

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 100
Orion_B54Q(config-router)# address-family vpnv4
Orion_B54Q(config-router-af)# neighbor 10.0.0.1 activate
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform
Description None

5.99 neighbor advertisement-interval

Use this command to set the time interval to send the BGP route update message. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **advertisement-interval** *seconds*

no neighbor {peer-address | peer-group-name} advertisement-interval

Parameter	Description
<i>peer address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>seconds</i>	Time interval to send the route update message in the range from 0 to 600 seconds

Defaults
 IBGP connection: 15 seconds
 EBGP connection: 30 seconds

Command Mode
 BGP configuration mode/ BGP IPv4 VRF configuration mode / BGP IPv6 VRF address family configuration mode

Usage Guide
 If you have specified the BGP peer group, all members of the peer group will adopt the settings of the command.

Configuration Examples
 The following example sets the time interval to send the BGP route update message.

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 100
Orion_B54Q(config-router)# neighbor 10.0.0.1 advertisement-interval 10
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform Description
 None

5.100 neighbor allowas-in

Use this command to allow the PE to receive messages with the same AS number as itself. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} allowas-in number

no neighbor {peer-address | peer-group-name} allowas-in

Parameter	Description
<i>peer address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>number</i>	Number of the AS number duplication in the range from 1 to 10, 3 by default

Defaults
 This function is disabled by default.

Command BGP configuration mode/ IPv4 address family configuration mode/ IPv4 VRF address family configuration mode / IPv6 VRF address family configuration mode

Usage Guide
 A typical application is spoke_hub mode. Execute this command on the PE to enable it to receive and then send the advertised address prefix. Configure two VRFs on the PE. One VRF receives the routes of all PEs and advertises them to the CE; the other VRF receives the routes advertised by the CE and advertises them to all PEs.
 This command applies to IBGP or EBGP peers.

Configuration Examples
 The following example allows the PE to receive messages with the same AS number as itself.

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.1.1.1 remote-as 100
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router-af)# neighbor 10.1.1.1 allowas-in
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform Description None

5.101 neighbor as-originate-interval

Use this command to configure the interval that the device advertises local original BGP routes to the peer (group). Use the **no** or **default** form of this command to restore the default setting.

neighbor { *peer-address* | *peer-group-name* } **as-origination-interval** *seconds*

no neighbor { *peer-address* | *peer-group-name* } **as-origination-interval**

default neighbor { *peer-address* | *peer-group-name* } **as-origination-interval**

Parameter Description

Parameter	Description
<i>peer address</i>	IP address of the peer.
<i>peer-group-name</i>	Name of the peer group, containing up to 32 characters.
<i>seconds</i>	The interval at which the device advertises local original BGP routes to the peer (group), in the range from 1 to 65535 in the unit of seconds.

Defaults The default interval is 1.

Command Mode BGP configuration mode/ BGP IPv4 VRF address family configuration mode/ BGP IPv6 VRF address family configuration mode/ BGP scope global configuration mode.

Usage Guide If you specify a peer group name in this command, the configuration takes effect on all members of the peer group.

The following example configures the interval at which the device advertises local original BGP routes to the peer in the BGP IPv4 VRF address family configuration mode.

Configuration Examples

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router-af)# neighbor 10.0.0.1 remote-as 100
Orion_B54Q(config-router-af)# neighbor 10.0.0.1 as-origination-interval 10
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

5.102 neighbor as-override

Use this command to allow the PE to override the AS number of a site. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} as-override

no neighbor {peer-address | peer-group-name} as-override

Parameter Description	Parameter	Description
	peer address	IP address of the peer
	peer-group-name	Name of the peer group of up to 32 characters

Defaults This function is disabled by default.

Command Mode BGP IPv4 VRF address family configuration mode/ BGP IPv6 VRF address family configuration mode

In general, BGP will not receive the messages with the same AS number as the autonomous area. This command can override the AS number, so that BGP can receive the messages with the same AS number.

Usage Guide A typical application is in a VPN where two CEs have the same AS number. Usually the CEs cannot receive messages from each other. Executing this command on a PE will override the AS number of one CE it connects. As a result, the other CE can receive the peer’s route messages. This command applies only to EBGp peers.

Configuration The following example allows the PE to override the AS number of a site.

Examples

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.1.1.1 remote-as 100
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router-af)# neighbor 10.1.1.1 as-override
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.103 neighbor default-originate

Use this command to allow the BGP speaker to advertise the default route to the peer (group). Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **default-originate** [*route-map map-tag*]

no neighbor {*peer-address* | *peer-group-name*} **default-originate** [*route-map map-tag*]

Parameter

Description

Parameter	Description
<i>peer address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>map-tag</i>	Name of the route-map of up to 32 characters

Defaults

This function is disabled by default.

Command

Mode

BGP configuration mode, BGP IPv4 unicast address family configuration mode, BGP IPv4 multicast address family configuration mode, BGP IPv4 VRF address family configuration mode, BGP IPv6 VRF address family configuration mode, BGP IPv6 unicast address family configuration mode and BGP IPv6 multicast address family configuration mode

Usage

Guide

This command requires redistributing the default route only when the default route exists locally. If you have specified the BGP peer group, all members of the peer group will adopt the settings of the command. If you set the command for a member in the peer, this command will overwrite the settings on the peer group.

Configuration

Examples

```
The following example allows the BGP speaker to advertise the default route to the peer (group).
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.1.1.1 remote-as 80
Orion_B54Q(config-router)# neighbor 10.1.1.1 default-originate
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.

Related Commands	Command	Description
	neighbor remote-as	Configures the BGP peer.

Platform
Description None

5.104 neighbor description

Use this command to set a descriptive sentence for the specified peer (group). Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **description** *text*

no neighbor {*peer-address* | *peer-group-name*} **description**

Parameter Description	Parameter	Description
	<i>peer address</i>	IP address of the peer
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters
	<i>text</i>	Descriptive text of the peer (group) of up to 80 characters

Defaults This function is disabled by default.

Command Mode BGP configuration mode, BGP IPv4 VRF address family configuration mode and BGP IPv6 VRF address family configuration mode.

Usage Guide This command is used to add descriptive characters for the peer (group). This may help remember features and characteristics of the peer (group).

Configuration Examples

The following example sets a descriptive sentence for the specified peer (group).

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.1.1.1 remote-as 80
Orion_B54Q(config-router)# neighbor 10.1.1.1 description xyz.com
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.
	neighbor remote-as	Configures the BGP peer.

Platform
Description None

5.105 neighbor distribute-list

Use this command to implement the routing policy based on the ACL when receiving/sending route information from/to the specified BGP peer. Use the **no** form of this command to restore the default setting.

neighbor { *peer-address* | *peer-group-name* } **distribute-list** { *access-list-number* } { **in** | **out** }

no neighbor { *peer-address* | *peer-group-name* } **distribute-list** { *access-list-number* } { **in** | **out** }

Parameter	Description
<i>peer address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>access-list-number</i>	ACL number
in	Specifies the ACL for filtering the incoming routes.
out	Specifies the ACL for filtering the outgoing routes.

Defaults This function is disabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ BGP IPv4 VRF configuration mode/ BGP IPv6 VRF address family configuration mode/ BGP VPNv4 address family configuration mode.

For in rule or out rule, this command cannot be used together with the **neighbor prefix-list** command. Only one of them can take effect.

Usage Guide If you have specified the BGP peer group, all members of the peer group will adopt the settings. If you set the **neighbor distribute-list** command for a member in the peer, this command will overwrite the settings on the peer group.

You can set different filtering policies in different address-family configuration modes to control routes.

The following example implements the routing policy based on the ACL when receiving/sending route information from/to the specified BGP peer.

Configuration Examples

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.1.1.1 remote-as 80
Orion_B54Q(config-router)# neighbor 10.1.1.1
distribute-list bgp-filter in
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
ip access-list	Creates a standard IP ACL or extended IP ACL.

Platform Description None

5.106 neighbor ebgp-multihop

Use this command to allow establishing BGP connection between EBGP peers that are not directly connected. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop** [*ttl*]

no neighbor {*peer-address* | *peer-group-name*} **ebgp-multihop** [*ttl*]

Parameter	Description
<i>peer address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>ttl</i>	Maximum hops in the range 1 to 255

Parameter
Description

Defaults

The BGP connection is allowed between EBGP peers connected with each other directly by default.

If "ebgp-multihop" is followed by no parameter, the ttl is 255.

Command
Mode

BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

Usage
Guide

To prevent routing loop and dampening, non-default routes that can reach the peer must exist between EBGP peers between which the BGP connection can only be established via multiple hops.

If the BGP peer group is specified, all members of the peer group adopt the settings. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration
Examples

The following example allows establishing BGP connection between EBGP peers that are not directly connected.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 65100
Orion_B54Q(config-router)# neighbor 10.0.0.1 ebgp-multihop
```

Related
Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform
Description

None

5.107 neighbor fall-over bfd

Use this command to enable BFD correlation with BGP. Use the **no** form or **default** form of this command to disable BFD correlation with BGP.

neighbor { *peer-address* | *peer-group-name* } **fall-over bfd**

no neighbor { *peer-address* | *peer-group-name* } **fall-over bfd**

default neighbor { *peer-address* | *peer-group-name* } **fall-over bfd**

	Parameter	Description
Parameter	<i>peer address</i>	IPv4 or IPv6 address of the peer.
Description	<i>peer-group-name</i>	Name of the peer group, containing up to 32 characters.

Defaults BFD correlation is disabled by default.

Command Mode BGP configuration mode / IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode/ Scope configuration mode

Usage Guide Before configuring BFD correlation, the BFD session parameters of the neighbor interface must be configured.

Configuration Examples

The following example enables BFD correlation to detect the forwarding path between local and the neighbor 172.16.0.2.

```
Orion_B54Q(config)# router bgp 45000
Orion_B54Q(config-router)# neighbor 172.16.0.2 remote-as 45001
Orion_B54Q(config-router)# neighbor 172.16.0.2 fall-over bfd
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.108 neighbor filter-list

Use this command to enable route filtering when sending/receiving routing information to/from BGP peers. Use the **no** form of this command to restore the default setting.

neighbor { *peer-address* | *peer-group-name* } **filter-list access-list-number** { **in** | **out** }

no neighbor { *peer-address* | *peer-group-name* } **filter-list access-list-number** { **in** | **out** }

Parameter	Parameter	Description
-----------	-----------	-------------

Description	<i>peer address</i>	IP address of the peer, IPv4 address or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters
	<i>access-list-number</i>	ACL number
	in	Applies as-path list on the received routing information.
	out	Applies as-path list on the distributed routing information.

Defaults The function is disabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode / address-family VPNv4 configuration mode

Usage Guide If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If the **neighbor filter-list** command is set for a member of the peer, the setting will overwrite the setting for the group.

You can set different filter policies in different address-family configuration modes to control routes.

The following example enables route filtering when sending/receiving routing information to/from BGP peers.

Configuration Examples

```
Orion_B54Q(config)# ip as-path access-list 1 deny _123_
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 65100
Orion_B54Q(config-router)# neighbor 10.0.0.1 filter-list 1 out
```

	Command	Description
Related Commands	router bgp	Enables the BGP protocol.
	neighbor remote-as	Configures the BGP peer.
	ip as-path access-list	Creates an AS_PATH list.
	match as-path	Matches the AS_PATH list.

Platform Description None

5.109 neighbor local-as

Use this command to configure the local AS number for the BGP peer, which could be used as its Remote AS to connect with local router. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **local-as** *as-number* [**no-prepend** [**replace-as** [**dual-as**]]]

no neighbor {*peer-address* | *peer-group-name*} **local-as**

Parameter	Parameter	Description
-----------	-----------	-------------

	<i>peer address</i>	IP address of the peer, IPv4 address or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters
Description	<i>as-number</i>	Local AS number, in the range from 1 to 65535. In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new AS notation range is from 1 to 4294967295, represented as from 1 to 65535.65535 in dot mode.
	no-prepend	The AS-PATH of the routing information received from the peer does not depend on the Local AS. This option is disabled by default.
	replace-as	The AS-PATH of the routing information sent to the peer replaces the BGP AS with the Local AS. This option is disabled by default.
	dual-as	Uses BGP AS or Local AS to establish BGP connection with the device. This option is disabled by default.

Defaults

No Local AS is configured for the peer. If Local AS is configured, no options is configured by default. The peer could only use Local AS to establish BGP connection with local device, and adds Local AS into the AS-PATH of the received routing information, inserts Local AS to the corresponding AS-PATH before sending the routing information to the peer.

Command Mode

BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv6 VRF address family configuration mode, IPv4 VRF address family configuration mode, and address-family VPNv4 configuration mode

Usage Guide

Local AS could be configured on the EBGP peer only, and if the attributes of the peer change, such as EBGP converts to IBGP or union EBGP, Local AS and corresponding options will be deleted. Local AS must be different from BGP AS and this peer's Remote AS and the union ID (if federation is configured). If you have specified the BGP peer group, all members of this peer group will adopt the settings of this command. You cannot set Local AS for the specified member of the peer group separately.

Configuration Examples

The following example configures the local AS number for the BGP peer.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 65100
Orion_B54Q(config-router)# neighbor 10.0.0.1 local-as 23
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description N/A

5.110 neighbor maximum-prefix

Use this command to limit the number of prefixes received from the specified BGP peer. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **maximum-prefix** *maximum* [*threshold*] [**warning-only**]

no neighbor {*peer-address* | *peer-group-name*} **maximum-prefix** *maximum*

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>maximum</i>	Upper limit of the number of the received route entries
<i>threshold</i>	Percentage of the maximum when alarming.
warning-only	Does not terminate the BGP connection when the route entries reach the upper limit but produce a log entry.

Defaults

This function is disabled by default.

Command Mode

BGP configuration mode, BGP IPv4 address family configuration mode, BGP IPv6 address family configuration mode, BGP IPv4 VRF address family configuration mode, BGP IPv6 VRF address family configuration mode, BGP VPNv4 address family configuration mode, BGP L2VPN VPWS/VPLS address family configuration mode.

Usage Guide

The BGP connection will be torn down when the received routes exceeds the upper limit by default. To prevent tearing down the connection, set the "warning-only" to control that.

If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration Examples

The following example limits the number of prefixes received from the specified BGP peer.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 maximum-prefix 1000
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description

None

5.111 neighbor next-hop-self

Use this command to set the next-hop of the route to the local BGP speaker while specifying the routes that the BGP peer redistributes. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

no neighbor {*peer-address* | *peer-group-name*} **next-hop-self**

Parameter Description	Parameter	Description
	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults This function is disabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

Usage This command is mostly used in the non-full-mesh-type network, such as the Frame Relay and X.25, where the BGP speakers within the same subnet cannot completely be accessed mutually.

Guide If you have specified the BGP peer group, all members of the peer group will adopt the settings of the command.

Configuration Examples The following example sets the next-hop of the route to the local BGP speaker.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 next-hop-self
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.
	neighbor remote-as	Configures the BGP peer.

Platform
Description None

5.112 neighbor next-hop-unchanged

Use this command to maintain the next-hop when sending routes to the peer(group). Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **next-hop-unchanged**

no neighbor {*peer-address* | *peer-group-name*} **next-hop-unchanged**

Parameter Description	Parameter	Description
	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address

<i>peer-group-name</i>	Name of the peer group of up to 32 characters
next-hop-unchanged	Maintains the next-hop while sending the routes to the peer(group).

Defaults The next-hop will be changed by default when routes are sent to the EBGP peer.

Command

Mode BGP configuration mode/ IPv4 address family configuration mode/ BGP VPN configuration mode

Usage Guide

This command is used to control to maintain the next-hop route transmitting between multi-hop EBGP peer sessions. This command cannot be configured on the route reflector. And for the client of the route reflector, if this function is enabled, the **neighbor next-hop-self** command cannot be used to change the next-hop of routes. This function is mainly applied to the cross-domain VPN. In the implementation with the Option C adopted, to reduce the complete connectivity between the PEs of the cross-domain CPN, a route reflector can be set in every autonomous domain to establish the Multihop MP-EBGP connection to implement the VPN route interaction. As the next-hop route is changed as itself while sending routes to the EBGP peer by default, PE stations of other autonomous domains will consider the final next-hop of the VPN route as the route reflector when receiving the VPN route at last, which will result in all cross-domains VPN flow going through the reflector. However, usually this is not the optimal forwarding path, and the requirement for the forwarding performance of the RR is higher. To avoid this condition, use the **neighbor next-hop-unchanged** command in the address-family VPNv4 configuration mode to maintain the next-hop of the VPNv4 route sent to the BGP peer when establishing the cross-domain Multihop MP-EBGP connection on the router reflector.

Configuration Examples

```
The following example maintains the next-hop when sending routes to the peer (group).
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# address-family vpnv4
Orion_B54Q(config-router-af)# neighbor 10.1.1.1 next-hop-unchanged
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.113 neighbor password

When the BGP connection with the BGP peer is established, use this command to enable TCP MD5 authentication and set the password. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **password** [0 | 7] *string*

no neighbor {peer-address | peer-group-name} password

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
0	Displays the password with encryption.
7	Displays the password without encryption.
<i>string</i>	Password for MD5 authentication in the range from up to 80 characters

Defaults The function is disabled by default

Command Mode BGP configuration mod, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode

Usage Guide This command will enable MD5 authentication of the TCP. BGP peers must have the same password configured; otherwise, the neighbor relationship cannot be established. When this command is set, the local BGP speaker will re-establish the BGP connection with the BGP peer. If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.
No matter in which mode, a neighbor has only one password, not one for every address family, .

Configuration Examples The following example enables TCP MD5 authentication and sets the password.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 password Red-Giant
```

Command	Description
router bgp	Enables the BGP protocol
neighbor remote-as	Configures the BGP peer.

Platform Description None

5.114 neighbor peer-group (creating)

Use this command to create a BGP peer group. Use the **no** form of this command to restore the default setting.

neighbor peer-group-name peer-group
no neighbor peer-group-name peer-group

Parameter	Parameter	Description
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Description	<i>peer-group-name</i>	Name of the peer group of up to 32 characters
--------------------	------------------------	---

Defaults No BGP peer group is created.

Command Mode BGP configuration mode/ BGP IPv4 VRF configuration mode/ BGP IPv6 VRF address family configuration mode

Usage Guide If multiple BGP peers use the same update policy, the peers can be configured in the same peer group, so as to simplify the configuration and boost operation efficiency.

Configuration Examples The following example creates a BGP peer group.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor Red-Giant peer-group
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
neighbor peer-group (assigning members)	Configures the specified peer as the member of the BGP peer group.
show ip bgp peer-group	Displays the information of the BGP peer.

Platform Description None

5.115 neighbor peer-group (assigning members)

Use this command to configure the specified peer as a member of the BGP peer group. Use the **no** form of this command to restore the default setting.

neighbor peer-address peer-group peer-group-name

no neighbor peer-address peer-group peer-group-name

Parameter Description	Parameter	Description
	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults No peer exists in the peer group.

Command Mode BGP configuration mode/ BGP IPv4 VRF configuration mode/ BGP IPv6 VRF address family configuration mode

Usage Members of the peer group can adopt all configurations of the peer.

Guide It is allowed to configure an individual member of the peer group to replace the universal

configuration for the peer group, but such separate configuration does not contain the configuration information that may affect the output update. In other words, every member in the peer group will always adopt the following configurations of the peer group: remote-as, update-source, local-as, reconnect-interval, times, advertisement-interval, default-originate, next-hop-self, remove-private-as, send-community, distribute-list out, filter-list out, prefix-list out, route-map out, unsuppress-map, route-reflector-client.

- Do not place neighbors of different address families in the same peer group, or place IBGP and EBGP neighbors in the same peer group.

The following example configures the specified peer as a member of the BGP peer group.

Configuration Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor Red-Giant peer-group
Orion_B54Q(config-router)# neighbor 10.0.0.1 peer-group Red-Giant
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
neighbor peer-group (creating)	Creates the BGP peer group.
show ip bgp peer-group	Displays the information of the BGP peer.

Platform

Description None

5.116 neighbor prefix-list

Use this command to implement the routing policy based on the prefix list to receive/transmit routes from/to the BGP peer. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} **prefix-list** prefix-list-name {in | out}

no neighbor {peer-address | peer-group-name} **prefix-list** prefix-list-name {in | out}

Parameter Description

Parameter	Description
<i>peer address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>prefix-lis-name</i>	Name of the prefix-list of up to 32 characters
in	Applies the prefix list to the received routes.
out	Applies the prefix list to the redistributed routes.

Defaults

This function is disabled by default.

Command

BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family

Mode configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode/ address-family VPNv4 configuration mode

For the "in" rule or "out" rule, this command cannot be used together with the **neighbor distribute-list** command. That is, only one of them takes effect.

Usage Guide If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If the **neighbor prefix-list in** command is set for a member of the peer, the setting will overwrite the setting for the group.

You can set different filter policies in different address-family configuration modes to control routes.

Configuration Examples The following example implements the routing policy based on the prefix list to receive/transmit routes from/to the BGP peer.

```
Orion_B54Q(config)# ip prefix-list bgp-filter deny 10.0.0.1/16
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 prefix-list bgp-filter in
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
ip prefix-list	Creates the prefix lists.

Platform Description None

5.117 neighbor remote-as

Use this command to configure the BGP peer (group). Use the **no** form of this command to restore the default setting.

neighbor { *peer-address* | *peer-group-name* } **remote-as** *as-number*

no neighbor { *peer-address* | *peer-group-name* } **remote-as**

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>as-number</i>	BGP peer (group) autonomous system number in the range from 1 to 65535 In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new AS notation range is from 1 to 4294967295, represented as from 1 to 65535.65535 in dot mode.

Defaults No BGP peer is configured.

Command Mode	BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode
Usage Guide	If you have specified the BGP peer group, all members of the peer group will inherit the settings of the command.

Configuration Examples The following example configures the BGP peer (group).

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 80
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.

Platform Description	None
-----------------------------	------

5.118 neighbor remove-private-as

Use this command to delete the private AS number recorded in the AS path attribute in the route sent to the specified EBGp peer. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

no neighbor {*peer-address* | *peer-group-name*} **remove-private-as**

Parameter Description	Parameter	Description
	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults This function is disabled by default.

Command Mode	BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode
---------------------	--

Usage Guide	This command takes effect only on EBGp peers. If the AS path contains the private AS number that is the AS number of the EBGp peer to be sent, the AS number is not deleted. Private AS number range: 64512 - 65535
--------------------	---

Configuration Examples The following example deletes the private AS number recorded in the AS path attribute in the route sent to the specified EBGp peer

```
Orion_B54Q(config)# router bgp 65000
```

```
Orion_B54Q(config-router)# neighbor 10.0.0.1 remove-private-as
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.119 neighbor route-map

Use this command to enable route match for the received/sent routes. Use the **no** form of this command to disable this function.

neighbor { *peer-address* | *peer-group-name* } **route-map** *map-tag* {in | out}

no neighbor { *peer-address* | *peer-group-name* } **route-map** *map-tag* {in | out}

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>map-tag</i>	Name of the match rule
in	Applies the rule to the incoming routes.
out	Applies the rule to the outgoing routes.

Defaults N/A

Command Mode

BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode, IPv4 VPNv4 address family configuration mode, BGP L2VPN VPLS/VPWS address family configuration mode.

Usage

This command can be used to filter the incoming and outgoing routes for different neighbors by using different incoming/outgoing rules, purifying and controlling routes.

Guide

You can set different filter policies in different address-family configuration modes to control routes.

Configuration Examples

The following example enables route match for the received/sent routes.

```
Orion_B54Q(config-router)# neighbor 10.0.0.1 route-map map-tag in
```

Related Commands

Command	Description
neighbor soft-reconfiguration inbound	Stores the routing information sent from the BGP peer.
show ip bgp	Displays the BGP route entry.

Platform
Description None

5.120 neighbor route-reflector-client

Use this command to configure the local device as the route reflector and specifies its client. Use the **no** form of this command to restore the default setting.

neighbor *peer-address* **route-reflector-client**

no neighbor *peer-address* **route-reflector-client**

Parameter	Parameter	Description
Description	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address

Defaults This function is disabled by default.

Command
Mode BGP configuration mode

Usage By default, all IBGP speakers in the autonomous system must establish neighbor relationship with each other. The BGP speaker does not forward the routes learned from an IBGP peer to other IBGP peers to avoid route loop.

Guide This command can be used to set route reflector, so that there is no need for all IBGP speakers to establish full neighboring relationship between each other. This will allow the route reflector to forward learned IBGP routes to other IBGP peers.

Configuration The following example configures the local device as the route reflector and specifies its client.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 route-reflector-client
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
bgp cluster-id	Configures the cluster ID of the route reflectors.
bgp client-to-client reflection	Enables the route reflection between clients

Platform
Description None

5.121 neighbor send-community

Use this command to transmit community attributes to the specified BGP neighbor. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **send-community** [**both** | **standard** | **extended**]

no neighbor {*peer-address* | *peer-group-name*} **send-community** [**both** | **standard** | **extended**]

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
both	Transmits both standard and extended communities.
standard	Transmits the standard community only.
extended	Transmits the extended community only.

Defaults This function is disabled by default.

Command Mode BGP configuration mode, BGP IPv4 Unicast VRF address family configuration mode, BGP IPv6 Unicast/VRF address family configuration mode, BGP VPNv4/VPNv6 address family configuration mode, BGP L2VPN VPWS/VPLS address family configuration mode, BGP scope configuration mode

Usage

Guide This command transmits the community to the neighbor or neighbor group.

Configuration Examples The following example transmits community attributes to the specified BGP neighbor.

```
Orion_B54Q(config-router)# neighbor 10.1.1.1 send-community both
```

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
ip community-list	Creates the community list.

Platform

Description None

5.122 neighbor send-label

Use this command to specify the device to send the route carrying the MPLS label to a neighbor. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **send-label**

no neighbor {*peer-address* | *peer-group-name*} **send-label**

	Parameter	Description
Parameter Description	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults This function is disabled by default.

Command Mode BGP configuration mode, IPv4 address family configuration mode and IPv4 VRF address family configuration mode

Usage Guide Use this command to allow the BGP sending the routes with MPLS label requiring two ends of the peer should be configured this command. The configuration of this command takes effect only after the neighbor is restarted. This command is configured in BGP configuration mode and takes effect on the ipv4 unicast address-family only by default. For AS border routers, only when this command is configured, the MPLS label can be forwarded on the AS border.

The following example specifies the device to send the route carrying the MPLS label to a neighbor.

Configuration Examples

```
Orion_B54Q(config)# router bgp 100
Orion_B54Q(config-router)# neighbor 192.168.0.1 remote-as 101
Orion_B54Q(config-router)# neighbor 192.168.0.1 send-label
```

	Command	Description
Related Commands	router bgp	Enables the BGP protocol.
	neighbor remote-as	Configures the BGP peer.

Platform Description N/A

5.123 neighbor shutdown

Use this command to disconnect the BGP connection established with the specified BGP peer. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} shutdown
no neighbor {peer-address | peer-group-name} shutdown

	Parameter	Description
Parameter Description	<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults This function is disabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family

configuration mode

This command is used to disconnect valid connection established with the specified peer (group), and delete all associated routing information. However, this command still keeps the configuration information of that specified peer (group).

Usage

Guide

If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration

The following example disconnects the BGP connection established with the specified BGP peer.

Examples

```
Orion_B54Q(config)# router bgp 60
Orion_B54Q(config-router)# neighbor 10.0.0.1 shutdown
```

Related

Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
show ip bgp summary	Displays the BGP connection status.

Platform

Description

None

5.124 neighbor soft-reconfiguration inbound

Use this command to store the routing information sent from the BGP peer. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} soft-reconfiguration inbound

no neighbor {peer-address | peer-group-name} soft-reconfiguration inbound

Parameter

Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters

Defaults

This function is disabled by default.

Command

Mode

BGP configuration mode, BGP IPv4 Unicast VRF address family configuration mode, BGP IPv6 Unicast/VRF address family configuration mode, BGP VPNv4/VPNv6 address family configuration mode, BGP L2VPN VPWS/VPLS address family configuration mode, BGP scope configuration mode

Usage

This command restarts the BGP session, and keeps the unchanged routing information sent from the BGP peer (group).

Guide

Executing this command will consume more memories. If both parties support the route refresh

function, this command becomes unnecessary. You may run the **show ip bgp neighbors** command to judge whether the peer can support the route refresh function. If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

The following example stores the routing information sent from the BGP peer.

Configuration Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 soft-reconfiguration
inbound
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
show ip bgp neighbors	Displays the information of the BGP peer.
clear ip bgp	Resets the BGP peer session.

Platform

Description None

5.125 neighbor soo

Use this command to set the SOO value of the neighbor. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} **soo** soo-value

no neighbor {peer-address | peer-group-name} **soo**

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>soo-value</i>	SOO value There are two forms of soo_value: (1)soo_value = as_num:nn as_number:nn: as_number is the public AS number and nn is defined by yourself. The range is from 0 to 4294967295. (2)soo_value = ip_addr:nn ip_address:nn: IP address must be global and nn is defined by yourself. The range is from 0 to 65535. (3)soo_value = as4_num:nn an4_num is the public AS number (4 byte) and nn is defined by yourself, which ranges from 0 to 65535.

Defaults This function is disabled by default.

Command

Mode IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode.

Usage Guide In CE dual-home mode, execute this command to prevent routes sent by CE to PEs from being sent back to CE.

The following example sets the SOO value of the neighbor.

Configuration Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 remote-as 100
Orion_B54Q(config-router)# address-family ipv4 vrf vpn1
Orion_B54Q(config-router)# neighbor 10.0.0.1 soo 100:100
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
timers bgp	Configures the keepalive and holdtime values globally.

Platform

Description None

5.126 neighbor timers

In specifying BGP peer to establish the BGP connection, use this command to set the keepalive and holdtime time values used for establishing the BGP connection. Use the **no** form of this command to restore the default setting.

neighbor {peer-address | peer-group-name} **timers** keepalive holdtime [minimum-holdtime]

no neighbor [peer-address | peer-group-name] **timers**

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>keepalive</i>	Time interval to send the KEEPALIVE message to the BGP peer. Range: 0-65535 seconds
<i>holdtime</i>	Time interval to consider the BGP peer alive Range: 0-65535 seconds
<i>minimum-holdtime</i>	Allows a minimum holdtime value of neighbor advertisement. It is unrestricted when the value is 0. The range is 0 to 65535 seconds.

Defaults

keepalive: 60 seconds
holdtime: 180 seconds
minimum-holdtime: 0 seconds

Command BGP configuration mode, BGP IPv4 VRF address family configuration mode, BGP IPv6 VRF
Mode address family configuration mode

A proper keepalive value must not exceed one-third of the holdtime value.

Usage If the time is configured for an individual peer or a peer group, that peer or peer-group will use its

time to replace the global time configuration and connect the peer.

Guide If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration The following example sets the keepalive and holdtime time values used for establishing the
Examples BGP connection.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 80 240
```

	Command	Description
Related Commands	router bgp	Enables the BGP protocol.
	timers bgp	Sets the keepalive and holdtime values globally.

Platform

Description None

5.127 neighbor unsuppress-map

Use this command to selectively advertise routing information suppressed by aggregate-address command. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address* | *peer-group-name*} **unsuppress-map** *map-tag*

no neighbor {*peer-address* | *peer-group-name*} **unsuppress-map** *map-tag*

	Parameter	Description
Parameter Description	<i>peer-address</i>	IP address of the peer
	<i>peer-group-name</i>	Name of the peer group of up to 32 characters
	<i>map-tag</i>	Name of the route-map of up to 32 characters

Defaults This function is disabled by default.

Command BGP configuration mode, BGP IPv4 Unicast VRF address family configuration mode, BGP IPv6
Mode Unicast/VRF address family configuration mode, BGP VPNv4/VPNv6 address family configuration mode, BGP L2VPN VPWS/VPLS address family configuration mode, BGP scope configuration mode

Usage This command advertises the specified suppressed routes.

Guide If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration Examples The following example selectively advertises routing information suppressed by aggregate-address command.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 unsuppress-map
unspress-route
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.
aggregate-address	Configures the aggregate address.
route-map	Configures the route-map

Platform Description None

5.128 neighbor update-source

Use this command to configure the interface for BGP connection of the IBGP peer..

neighbor { *peer-address* | *peer-group-name* } **update-source** {*interface-type interface-number* | *address* }

Use the **no** form of the command to remove the source address configuration for the BGP peer.

no neighbor {*peer-address* | *peer-group-name*} **update-source**

Use the **default** form of the command to restore the default settings.

default neighbor { *peer-address* | *peer-group-name* } **update-source**

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer, IPv4 or IPv6 address
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>interface-type interface-number</i>	Interface name
<i>address</i>	The interface address which is used fro BGP connection. The address type (IPv4 or IPv6) must be same as that of the peer address.

Defaults The local interface is used as the egress interface by default.

Command BGP configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family

Mode configuration mode/ Scope configuration mode

You can use this command to enable the loopback interface to establish a BGP connection with the peer.

The interface address specified for BGP connection must be valid in local, otherwise the BGP connection may be faulty.

All members in a BGP peer group inherit the settings of this command. Particularly, if the interface address is used, only the member whose address type is same as the interface address's can inherit the settings of this command.

Usage

Guide

If the IPv6 address of the loopback interface is used for neighbor connection, both peers need to be configured with the loopback interface. The BGP connection can be established only when the address of the egress interface on the peer is same as that of the neighbor in local.

A loopback interface address can be configured on different interfaces. You need to specify only the interface name,

The peer configured with the IPv6 address of loopback interface support only one-hop BGP neighbor connection.

Configuration

The following example establishes the BGP connection.

Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# neighbor 10.0.0.1 update-source loopback 1
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.129 neighbor version

Use this command to display the number of the BGP protocol version used by the specific BGP neighbor. Use the **no** form of this command to restore the default setting.

neighbor { *peer-address* | *peer-group-name* } **version** *number*

no neighbor { *peer-address* | *peer-group-name* } **version**

Parameter

Description

Parameter	Description
<i>peer-address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>number</i>	Version number

Defaults

The default version number is 4.

Command

BGP configuration mode/ BGP IPv4 VRF address family configuration mode/ BGP IPv6 VRF

Mode address family configuration mode

Usage

Guide When the command is used, BGP will lose the version negotiation function.

Configuration Examples The following example displays the number of the BGP protocol version used by the specific BGP neighbor.

```
Orion_B54Q(config-router)# neighbor 10.1.1.1 version 4
```

Related Commands

Command	Description
router bgp	Enables the BGP protocol.
neighbor remote-as	Configures the BGP peer.

Platform

Description None

5.130 neighbor weight

Use this command to set the weight for the specific neighbor. Use the **no** form of this command to restore the default setting.

neighbor {*peer-address*|*peer-group-name*} **weight** *number*

no neighbor {*peer-address*|*peer-group-name*} **weight**

Parameter Description

Parameter	Description
<i>peer-address</i>	IP address of the peer
<i>peer-group-name</i>	Name of the peer group of up to 32 characters
<i>number</i>	Weight, in the range from 0 to 65535.

Defaults

No weight is configured for the specific neighbor by default. In this case, the learned route weight is 0 and the locally generated route's weight is 32768 initially.

Command Mode

BGP configuration mode, BGP IPv4 Unicast VRF address family configuration mode, BGP IPv6 Unicast/VRF address family configuration mode, BGP VPNv4/VPNv6 address family configuration mode, BGP L2VPN VPWS/VPLS address family configuration mode, BGP scope configuration mode

Usage

When the command is used, routes learnt from the neighbor use this value as the initial weight value. The higher the weight, the higher the priority is.

Guide

Executing the **set weight** command in the route map of the neighbor will overwrite this value.

Configuration Examples

```
Orion_B54Q(config-router)# neighbor 10.1.1.1 weight 73
```


Related Commands	Command	Description
	router bgp	Enables the BGP protocol.
	neighbor remote-as	Configures the BGP peer.

Platform
Description None

5.131 network

Use this command to configure the network information to be advertised by the local BGP speaker. Use the **no** form of this command to restore the default setting.

network *network-number* [**mask** *mask*] [**route-map** *map-tag*] [**backdoor**]

no network *network-number* [**mask** *mask*] [**route-map** *map-tag*] [**backdoor**]

Parameter Description	Parameter	Description
	<i>network-number</i>	Network number
	<i>mask</i>	Subnet mask
	<i>map-tag</i>	Name of the route-map of up to 32 characters
	backdoor	The route is a backdoor route.

Defaults No network information is specified by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

Usage Guide This command allows injecting the IGP route into the BGP routing table. The network information advertised can be direct route, static route and dynamic route.
The "route-map" can be used to modify the network information.

Configuration Examples The following example configures the network information to be advertised by the local BGP speaker.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# network 10.0.0.1 mask 255.255.0.0
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.
	redistribute	Configures the route redistribution.
	Network synchronization	Enables network synchronization.

Platform
Description None

5.132 network synchronization

Use this command to advertise the network information after the local BGP speaker is synchronized with the local device. Use the **no** form of this command to directly advertise the network information.

network synchronization

no network synchronization

	Parameter	Description
Parameter		
Description	N/A	N/A

Defaults This function is enabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

Usage Guide This command is used to modify the status of the network during the process of advertisement. It is not recommended to turn off this switch lest route black hole is caused.

Configuration Examples The following example advertises the network information after the local BGP speaker is synchronized with the local device.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# network synchronization
```

	Command	Description
Related Commands	router bgp	Enables the BGP protocol.
	redistribute	Configures the route redistribution.
	network(BGP)	Configures the route to be distributed.

Platform Description None

5.133 overflow memory-lack

Use this command to allow BGP to enter the OVERFLOW state when the memory is insufficient. Use the **no** form of this command to disable this function.

overflow memory-lack

no overflow memory-lack

	Parameter	Description
Parameter		
Description	N/A	N/A

Defaults Allow the BGP to enter the OVERFLOW state when the memory is insufficient.

Command

Mode BGP configuration mode

In the BGP OVERFLOW state, the newly-learned routes are discarded, which prevents the memory from increasing.

When this function is enabled, if the BGP address family is in the OVERFLOW state, the newly-learned routes will be discarded, which may result in network loop. To prevent this, BGP generates a default route directing to the NULL interface, and the default route will always exist in the OVERFLOW state.

Usage

Guide Use the **clear bgp {addressfamily|all} *** command to reset the BGP and clear the OVERFLOW state in the BGP address family.

Use the no option to disallow the BGP to enter the OVERFLOW state when the memory is insufficient, which may lead to the continuous exhaustion of the memory resources. When the memory has been exhausted to a certain degree, BGP will break down all neighbors and delete all learned routes.

Configuration

The following example sets BGP not to enter the OVERFLOW configuration status when the memory is insufficient.

Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# no memory-lack overflow
```

Related

Commands

Command	Description
clear bgp { addressfamily all } *	Resets the BGP address family.
show bgp { addressfamily all } summary	Displays the summary of the BGP address family.

Platform

Description None

5.134 redistribute

Use this to redistribute routes between the other routing protocol and the BGP. Use the **no** form of this command to restore the default setting.

redistribute protocol-type [route-map map-tag] [metric metric-value]

no redistribute protocol-type [route-map map-tag] [metric]

Parameter

Description


Parameter	Description
<i>protocol-type</i>	The source protocol types for redistributing routes, including connected, static, RIP
route-map map-tag	Specifies the route map. No route map is associated with by default.


metric <i>metric-value</i>	Sets the default metric of the routes to be redistributed, null by default.
-----------------------------------	---

Defaults This function is disabled by default.

Command Mode BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode, IPv4 VRF address family configuration mode, IPv6 VRF address family configuration mode

When a switch supports multiple routing protocols, the coordination between these protocols becomes an important task. The switch may run multiple routing protocols at the same time, so it should redistribute a protocol's information to another protocol. This is applicable to all IP routing protocols.

Usage Guide  When you configure the **no** form of this command with parameters, the corresponding parameter configuration will be removed. The no form removes redistribution without any parameters configured.

 The route metric generated by the route-map command takes precedence over the one generated by the metric option of this command. If both are unavailable, the redistributed one is used.

Configuration Examples The following example redistributes routes between the other routing protocol and the BGP.

```
Orion_B54Q(config-router)# redistribute static route-map static-rmap
Orion_B54Q(config-router)# no redistribute static
route-map static-rmap
Orion_B54Q(config-router)# no redistribute static
```

Related Commands	Command	Description
	show ip protocol	Displays the protocol configuration.

Platform Description None

5.135 redistribute ospf

Use this command to redistribute routes between OSPF and BGP. Use the **no** form of this command to restore the default setting.

redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match internal external** [1|2] **nssa-external** [1|2]]

no redistribute ospf *process-id* [**route-map** *map-tag*] [**metric** *metric-value*] [**match internal external** [1|2] **nssa-external** [1|2]]


Parameter	Parameter	Description
-----------	-----------	-------------


Description	<i>process-id</i>	OSPF process ID to be redistributed
	route-map <i>map-tag</i>	Specifies the route map. No route map is associated by default.
	metric <i>metric-value</i>	Sets the default metric of the routes to be redistributed, null by default.
	match	Matches the sub type of OSPF routes.
	internal	Matches the internal OSPF routes, the default configuration.
	external [1 2]	Matches the external OSPF routes. You can specify the concrete type (v1 or v2) or v1 and v2 without indication.
	nssa- external [1 2]	Matches the NSSA-external type of OSPF routes. You can specify the concrete type (v1 or v2) or v1 and v2 without indication.

Defaults This function is disabled by default.

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

When a switch supports multiple routing protocols, the coordination between these protocols becomes an important task. The switch may run multiple routing protocols at the same time, so it should redistribute a protocol's information to another protocol.

Usage Guide  When you configure the **no** form of this command with parameters, the corresponding parameter configuration will be removed. The **no** form removes redistribution without any parameters configured.

 The filtering rule of OSPF routing: filtering the OSPF routing type according to the configured match option before filtering the route-map rule. The route metric generated by the **route-map** command takes precedence over the one generated by the metric option of this command. If both are not available, the redistributed one is used.

Configuration Examples The following example redistributes routes between OSPF and BGP.

```
Orion_B54Q(config-router)# redistribute ospf 2 route-map static-rmap
Orion_B54Q(config-router)# no redistribute ospf 4 match external route-map ospf-rmap
Orion_B54Q(config-router)# no redistribute ospf 78
```

Related Commands	Command	Description
	show ip protocol	Displays the protocol configuration.

Platform Description None

5.136 redistribute isis

Use this command to redistribute routes between ISIS and BGP. Use the **no** form of this command to restore the default setting.

redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric** *metric-value*] [**level-1** | **level-1-2** | **level-2**]

no redistribute isis [*isis-tag*] [**route-map** *map-tag*] [**metric**] [**level-1** | **level-1-2** | **level-2**]

Parameter Description

Parameter	Description
<i>isis-tag</i>	(Optional)ISIS process ID to be redistributed
route-map <i>map-tag</i>	Specifies the route map. No route map is associated by default.
metric <i>metric-value</i>	Sets the default metric of the routes to be redistributed, null by default.
level-1	Redistributes level-1 ISIS routes.
level-1-2	Redistributes level-1 and level-2 ISIS routes.
level-2	Redistributes level-2 ISIS routes.

Defaults

This function is disabled by default.

Command Mode

BGP configuration mode, IPv4 address family configuration mode, or IPv6 address family configuration mode

When a switch supports multiple routing protocols, the coordination between these protocols becomes an important task. The switch may run multiple routing protocols at the same time, so it should redistribute a protocol's information to another protocol. This is applicable to all IP routing protocols.

Usage Guide

- i When you configure the **no** form of this command with parameters, the corresponding parameter configuration will be removed. The **no** form removes redistribution without any parameters configured.
- ▲ The filtering rule of ISIS routing is: filtering the ISIS routing type according to the configured level option before filtering the route-map rule. The route metric generated by the route-map command takes precedence over the one generated by the metric option of this command. If both are unavailable, the redistributed one is used.

Configuration Examples

The following example redistributes routes between ISIS and BGP.

```
Orion_B54Q(config-router)# redistribute isis route-map static-rmap
Orion_B54Q(config-router)# no redistribute isis test route-map isis-rmap
Orion_B54Q(config-router)# no redistribute isis
```

Related Commands

Command	Description
show ip protocol	Displays the protocol configuration.

Platform

Description None

5.137 router bgp

Use this command to enable the BGP protocol, configure the local autonomous system number and enter BGP protocol configuration mode. Use the **no** form of this command to restore the default setting.

router bgp *as-number*

no router bgp *as-number*

Parameter Description

Parameter	Description
<i>as-number</i>	AS number in the range from 1 to 65535 In the 10.4(3) or later versions, the 4-byte AS notation is supported, namely, the new AS notation range is from 1 to 4294967295, represented as from 1 to 65535.65535 in dot mode.

Defaults This function is disabled by default.

Command

Mode Global configuration mode

This command is used to start the BGP protocol.

RFC4839 defines a new reserved AS notation 23456, which cannot be used. The original private AS notation in the range from 64512 to 65534 is still effective, 65535 is reserved for special purposes.

Usage Guide

RFC 5398 also defines two groups of new reserved AS notation for documents, whose ranges are from 64496 to 64511 and from 65536 to 65551.

Configuration Examples The following example enables the BGP protocol.

```
Orion_B54Q(config)# router bgp 65000
```

Related Commands

Command	Description
ip routing	Enables IP routing.
bgp router-id	Sets the ID of the device running the BGP protocol
network	Sets the network information to be advertised by the local BGP speaker.

Platform

Description None

5.138 synchronization

Use this command to enable the synchronization mechanism of BGP and IGP routing information. Use the **no** form of this command to restore the default setting.

synchronization

no synchronization

Parameter	Parameter	Description
Description	N/A	N/A

Defaults This function is disabled by default.

Command Mode BGP configuration mode, IPv4 address family configuration mode, IPv6 address family configuration mode

The synchronization between BGP and IGP aims to prevent the possible route black hole. In any of the two cases below, you may cancel the synchronization mechanism to ensure fast convergence of routing information.

- Usage Guide**
- There is no route information which passes through this AS (In general, this AS is an end AS).
 - All devices within this AS operate BGP protocol and the full connection relationship is established among all BGP Speakers (The adjacent relationship is established between any two BGP Speakers).

Configuration Examples The following example enables the synchronization mechanism of BGP and IGP routing information.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# synchronization
```

Related Commands	Command	Description
	router bgp	Enables the BGP protocol.

Platform Description None

5.139 table-map

Use this command to control the route information distributed to the kernel table. Use the **no** form of this command to restore the default setting.

table-map route-map-name

no table-map

Parameter	Parameter	Description
Description	<i>route-map-name</i>	Name of the route-map

Defaults No table-map is configured by default,

Command Mode BGP configuration mode/ IPv4 address family configuration mode/ IPv6 address family configuration mode/ IPv4 VRF address family configuration mode/ IPv6 VRF address family configuration mode

Usage Guide BGP uses the table-map to control the information distributed to the kernel routing table. The table-map is used to modify attributes of that route information, and it only takes effect on the IPv4 address-family.

Configuration Examples The following example controls the route information distributed to the kernel table.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# table-map bgp_tm
```

Related Commands	Command	Description
	route-map	Configures the route-map

Platform Description None

5.140 timers bgp

Use this command to adjust the BGP network timer. Use the **no** form of this command to restore the default value.

timers bgp *keepalive holdtime* [*minimum-holdtime*]

no timers bgp

Parameter	Description
<i>keepalive</i>	Time interval to send the keepalive message to the BGP peer Range: 0-65535 seconds.
<i>holdtime</i>	Time interval to consider the BGP peer alive Range: 0-65535 seconds.
<i>minimum-holdtime</i>	Allows a minimum holdtime value of neighbor advertisement. It is unrestricted when the value is 0. The range is 0 to 65535 seconds.

Defaults *keepalive*: 60 seconds
holdtime: 180 seconds
minum-holdtime: 0 seconds

Command

Mode BGP configuration mode / BGP scope global configuration mode

A proper keepalive value must not exceed one-third of the holdtime value.

Usage

If the time is configured for an individual peer or a peer group, that peer or peer-group will use its time to replace the global time configuration and connect the peer.

Guide

If the BGP peer group is specified, all members of the peer group adopt the settings of this command. If this command is set for a member of the peer, the setting will overwrite the setting for the group.

Configuration

The following example adjusts the BGP network timer.

Examples

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# timers bgp 80 240
```

Related

Commands

Command	Description
neighbor timers	Sets the keepalive and holdtime values on the basis of neighbors.

Platform

Description None

5.141 scope

Use this command to enter the scope configuration mode and associate VRF with BGP. Use the **exit** command to exit the scope configuration mode. Use the **no** or **default** form of this command to remove the association between the VRF instance and BGP protocol.

scope { global | vrf vrf-name }

exit

no scope { global | vrf vrf-name }

default scope { global | vrf vrf-name }

Parameter

Description

Parameter	Description
global	Global routing table.
vrf vrf-name	VRF name.

Defaults

No scope address family is defined by default.

Command

Mode BGP configuration mode.

Usage

Enter the scope configuration mode to perform the configuration.

Guide

To exit the scope configuration mode, use the **exit** command.

⚠ In the scope configuration mode, the commands configured in the BGP configuration mode are converted to the form in the scope configuration mode. To restore the commands, execute the command **no route bgp** and configure the commands again.

Configuration Examples

The following example enters the scope global configuration mode.

```
Orion_B54Q(config)# router bgp 65000
Orion_B54Q(config-router)# scope global
```

Related Commands

Command	Description
N/A	N/A

Platform

Description N/A

5.142 show bgp all

Use this command to display all the address-families information of BGP route. The use of this command is consistent with other BGP's show commands.

Display the parameters of the route information.

show bgp all [community | filter-list | community-list | dampening {flap-statistics | dampened-paths} | regexp | quote-regexp | neighbors {received-routes | routes | advertised-routes}]

Display the route dampening parameter.

show bgp all dampening parameters

Display the related information of the neighbors.

show bgp all neighbors.

show bgp all summary

Display the path information.

show bgp all paths

Parameter Description

Parameter	Description
Please refer to the detailed description of show bgp ipv4 unicast command.	Please refer to the detailed description of show bgp ipv4 unicast command.

Defaults

Please refer to the detailed description of **show bgp ipv4 unicast** command.

Command

Mode Privileged EXEC mode

Usage

Guide Please refer to the detailed description of **show bgp ipv4 unicast** command..

Configuration

Examples None

**Related
Commands**

Command	Description
show bgp ipv4 unicast	Displays the IPv4 unicast route information of BGP

Platform

Description None

5.143 show bgp ipv4 unicast

Use this command to display the IPv4 unicast route information of BGP.

- show bgp ipv4 unicast [vrf *vrf-name*] [*network* [*network-mask*]]**
- show bgp ipv4 unicast [vrf *vrf-name*] community *community-number* [exact-match]**
- show bgp ipv4 unicast [vrf *vrf-name*] community-list *community-name* [exact-match]**
- show bgp ipv4 unicast [vrf *vrf-name*] dampening dampened-paths**
- show bgp ipv4 unicast [vrf *vrf-name*] dampening flap-statistics**
- show bgp ipv4 unicast [vrf *vrf-name*] filter-list *path-list-number***
- show bgp ipv4 unicast [vrf *vrf-name*] inconsistent-as**
- show bgp ipv4 unicast [vrf *vrf-name*] prefix-list *ip-prefix-list-name***
- show bgp ipv4 unicast [vrf *vrf-name*] quote-regexp *regexp***
- show bgp ipv4 unicast [vrf *vrf-name*] regexp *regexp***
- show bgp ipv4 unicast [vrf *vrf-name*] route-map *map-tag***
- show bgp ipv4 unicast [vrf *vrf-name*] neighbors *neighbor-address* [received-routes | routes | advertised-routes]**
- show bgp ipv4 unicast [vrf *vrf-name*] cidr-only**
- show bgp ipv4 unicast [vrf *vrf-name*] labels**

**Parameter
Description**

Parameter	Description
<i>vrf-name</i>	VRF name
<i>network</i>	Displays the specific routing information in the routing table
<i>network-mask</i>	Displays the routing information included in the specified network.
community <i>community-number</i>	Displays the routing information including the specified community value. Community-number can be in the format of AA:NN (autonomous system number / 2-byte number), or the following pre-defined value: internet, no-export, local-as, no-

	advertise.
community-list <i>community-name</i>	Displays the BGP routing information matching the specified community-list.
exact-match	Routing information exactly matching the community value or community-list.
dampening dampened-paths	Displays the restrained routing information.
dampening flap-statistics	Displays the routing dampening statistics.
filter-list <i>path-list-number</i>	Displays the routing information matching the filter-list.
inconsistent-as	Displays the routing information of the inconsistent source AS.
prefix-list <i>ip-prefix-list-name</i>	Displays the routing information matching the specified prefix-list.
quote-regexp <i>regexp</i>	Displays the BGP routing information with the AS path attribute matching the specified regexp within the double quote marks.
regexp <i>regexp</i>	Displays the BGP routing information with the AS path attribute matching the specified regexp.
route-map <i>map-tag</i>	Displays the routing information matching the specified route-map filtering condition.
neighbors <i>neighbor-address</i> received-routes	Displays all routing information received from the specified peer (including the accepted and refused route).
neighbors <i>neighbor-address</i> routes	Displays all the routing information received from the peer and accepted.
neighbors <i>neighbor-address</i> advertised-routes	Displays all the routing information sent to the specified peer.
cidr-only	Displays the routing information without the category.
labels	Displays the BGP-learned and BGP-sent routes with the MPLS label.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Use this command to view the IPv4 unicast route information of BGP. You can filter the information with the specified parameter to display the matching route information.

Configuration

The following example displays the IPv4 unicast route information of BGP.

Examples

```
Orion_B54Q# show bgp ipv4 unicast
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
      S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Network  Next Hop  Metric  LocPrf  Path
```

```

*>i44.0.0.0 192.168.195.183 0 100 i
*>i64.12.0.0/16 192.168.195.183 0 100 i
*>i172.16.0.0/24 192.168.195.183 0 100 i
*>i202.201.0.0 192.168.195.183 0 100 i
*>i202.201.1.0 192.168.195.183 0 100 i
*>i202.201.2.0 192.168.195.183 0 100 i
*>i202.201.3.0 192.168.195.183 0 100 i
*>i202.201.18.0 192.168.195.183 0 100 i
Total number of prefixes 8
Orion_B54Q# show bgp ipv4 unicast community 11:2222
111:12345
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
    S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
  Network  Next Hop  Metric  LocPrf  Path
*>i202.201.0.0 192.168.195.183 0 100 i
*>i202.201.1.0 192.168.195.183 0 100 i
*>i202.201.2.0 192.168.195.183 0 100 i
*>i202.201.3.0 192.168.195.183 0 100 i
Total number of prefixes 4
Orion_B54Q(config)# ip as-path access-list 5 permit .*
Orion_B54Q# show bgp ipv4 unicast filter-list 5
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
    S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
  Network  Next Hop  Metric  LocPrf  Path
*>192.168.88.0 0.0.0.0 32768 ?
Total number of prefixes 1
Orion_B54Q# show ip bgp cidr-only
BGP table version is 2, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
    S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
  Network  Next Hop  Metric  LocPrf  Path
*>i64.12.0.0/16 192.168.195.183 0 100 i
*>i172.16.0.0/24 192.168.195.183 0 100 i
Total number of prefixes 2
Orion_B54Q# show bgp ipv4 unicast labels
Network  Next Hop  In Label/Out Label

```

```
1.1.1.1/32 192.167.1.1 17/18
1.1.1.2/32 192.167.1.1 nolabel/19
```

Field	Description
Network	Route prefix
Nexthop	Nexthop IP address of the route
In label	Label assigned by this router (if any).
Out label	Label learnt from the nexthop router (if any).

Related Commands	Command	Description
	<code>show ip bgp</code>	Displays the IPv4 unicast route information of BGP.

Platform

Description None

5.144 show bgp ipv4 unicast dampening parameters

Use this command to display the IPv4 unicast route dampening parameters configured for the BGP.

show bgp ipv4 unicast [vrf *vrf-name*] dampening parameters

Parameter	Parameter	Description
Description	<i>vrf-name</i>	VRF name

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide This command is used to display the IPv4 unicast route dampening parameters configured for BGP.

Configuration Examples The following example displays the IPv4 unicast route dampening parameters configured for the BGP.

```
Orion_B54Q(config-router)# bgp dampening 25 10000 10000 200
Orion_B54Q# show bgp ipv4 unicast dampening parameters
dampening 25 10000 10000 200
Dampening Control Block(s):
Reachability Half-Life time : 25 min
Reuse penalty      : 10000
Suppress penalty   : 10000
Max suppress time  : 200 min
```

```
Max penalty (ceil)      : 29800000
Min penalty (floor)    : 5000
```

Related

Commands N/A

Platform

Description None

5.145 show bgp ipv4 unicast neighbors

Use this command to display the related information of BGP IPv4 unicast neighbor.

show bgp ipv4 unicast [vrf vrf-name] neighbors neighbor-address

Parameter	Parameter	Description
Description	neighbor-address	Neighbor IPv4 address

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to view the information of the connection with BGP IPv4 unicast neighbor.

Configuration The following example displays the related information of BGP IPv4 unicast neighbor.

Examples

```
Orion_B54Q# show bgp ipv4 unicast neighbors
BGP neighbor is 192.168.195.183, remote AS 23, local AS 23, internal
link
  BGP version 4, remote router ID 44.0.0.1
  BGP state = Established, up for 00:06:37
  Last read 00:06:37, hold time is 180, keepalive interval is 60 seconds
  Neighbor capabilities:
  Route refresh: advertised and received (old and new)
  Address family IPv4 Unicast: advertised and received
  Graceful restart: advertised and received
  Remote Restart timer is 120 seconds
  Received 14 messages, 0 notifications, 0 in queue
  open message:1 update message:4 keepalive message:9
  refresh message:0 dynamic cap:0 notifications:0
  Sent 12 messages, 0 notifications, 0 in queue
  open message:1 update message:3 keepalive message:8
  refresh message:0 dynamic cap:0 notifications:0
```



```

Route refresh request: received 0, sent 0
Minimum time between advertisement runs is 0 seconds
For address family: IPv4 Unicast
BGP table version 2, neighbor version 1
Index 2, Offset 0, Mask 0x4
Inbound soft reconfiguration allowed
8 accepted prefixes
0 announced prefixes
Connections established 2; dropped 1
Local host: 192.168.195.239, Local port: 1074
Foreign host: 192.168.195.183, Foreign port: 179
Nexthop: 192.168.195.239
Nexthop global: ::
Nexthop local: ::
BGP connection: non shared network
Last Reset: 00:06:43, due to BGP Notification sent
Notification Error Message: (Cease/Unspecified Error Subcode)
Using BFD to detect fast fallover
    
```

Related

Commands N/A

Platform

Description None

5.146 show bgp ipv4 unicast paths

Use this command to display the path information of the IPv4 unicast in the route database.

show bgp ipv4 unicast [vrf *vrf-name*] paths

Parameter	Parameter	Description
Description	N/A	N/A

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to view the path information in the route database.

Configuration The following example displays the path information of the IPv4 unicast in the route database.

Examples Orion_B54Q# show bgp ipv4 unicast paths

```
Address Refcnt Path
[0x1d7806a0:0] (67)
[0x1d7389a0:13] (20) 10
```

Related**Commands** N/A**Platform****Description** None

5.147 show bgp ipv4 unicast summary

Use this command to display the related information of BGP IPv4 unicast.

show bgp ipv4 unicast [vrf *vrf-name*] summary

Parameter	Parameter	Description
Description	<i>vrf-name</i>	VRF name

Defaults N/A**Command****Mode** Privileged EXEC mode**Usage****Guide** This command is used to display the related information of BGP IPv4 unicast.

The following example displays the related information of BGP IPv4 unicast.

```
Orion_B54Q # show bgp ipv4 unicast summary
BGP router identifier 192.168.183.1, local AS number 23
BGP table version is 2
2 BGP AS-PATH entries
1 BGP community entries
Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd
192.168.195.79 4 24 0 0 0 0 0 never Active
192.168.195.183 4 23 17 15 1 0 0 00:09:04 8
Total number of neighbors 2
```

Configuration**Examples****Related****Commands**

Command	Description
router bgp	Enables the BGP protocol

Platform**Description** None

5.148 show bgp ipv6 unicast

Use this command to display the IPv6 unicast routing information of BGP.

- show bgp ipv6 unicast** [vrf *vrf-name*] [*IPv6-Prefix*]
- show bgp ipv6 unicast** [vrf *vrf-name*]community *community-number* [exact-match]
- show bgp ipv6 unicast** [vrf *vrf-name*]community-list *community-name* [exact-match]
- show bgp ipv6 unicast** [vrf *vrf-name*]dampening dampened-paths
- show bgp ipv6 unicast** [vrf *vrf-name*]dampening flap-statistics
- show bgp ipv6 unicast** [vrf *vrf-name*]filter-list *path-list-number*
- show bgp ipv6 unicast** [vrf *vrf-name*]inconsistent-as
- show bgp ipv6 unicast** [vrf *vrf-name*]prefix-list *ipv6-prefix-list-name*
- show bgp ipv6 unicast** [vrf *vrf-name*]quote-regexp *regexp*
- show bgp ipv6 unicast** [vrf *vrf-name*] regexp *regexp*
- show bgp ipv6 unicast**[vrf *vrf-name*] route-map *map-tag*
- show bgp ipv6 unicast** [vrf *vrf-name*]neighbors *neighbor-address*[received-routes | routes | advertised-routes]

Parameter
Description

Parameter	Description
<i>vrf-name</i>	VRF name
<i>IPv6-prefix</i>	Displays the IPv6 routing information included in the specified network. The input format of the routing information prefix is X:X:X:X::X/<0-128>.
community <i>community-number</i>	Displays the routing information including the specified community value. Community-number can be in the format of AA:NN (autonomous system number / 2-byte number), or the following pre-defined value: internet, no-export, local-as, no-advertise.
community-list <i>community-name</i>	Displays the BGP routing information matching the specified community-list.
exact-match	Routing information exactly matches the community value or community-list.
dampening dampened-paths	Displays the restrained routing information.
dampening flap-statistics	Displays the routing dampening statistics.
filter-list <i>path-list-number</i>	Displays the routing information matching the filter-list.
inconsistent-as	Displays the routing information of the inconsistent source AS.
prefix-list <i>ipv6-prefix-list-name</i>	Displays the routing information matching the specified prefix-list.
quote-regexp <i>regexp</i>	Displays the BGP routing information with the AS path attribute matching the specified regexp within the double quote marks.
regexp <i>regexp</i>	Displays the BGP routing information with the AS path attribute

	matching the specified regexp.
route-map <i>map-tag</i>	Displays the routing information matching the specified route-map filtering condition.
neighbors <i>neighbor-address</i> received-routes	Displays all routing information received from the specified peer (including accepted and refused routes).
neighbors <i>neighbor-address</i> routes	Displays all the routing information received from the peer and accepted.
neighbors <i>neighbor-address</i> advertised-routes	Displays all the routing information sent to the specified peer.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide

Use this command to view the IPv6 unicast route information of BGP. You can filter the information with the specified parameter to display the matching route information. The function and use of this command is similar to the **show bgp ipv4 unicast** command, please refer to the command.

Configuration

Examples N/A

Related

Commands

Command	Description
show bgp ipv4 unicast	Displays the IPv4 unicast route information of BGP.

Platform

Description None

5.149 show bgp ipv6 unicast dampening parameters

Use this command to display the IPv6 unicast route dampening parameters configured for BGP.

show bgp ipv6 unicast [vrf *vrf-name*] dampening parameters

Parameter

Description

Parameter	Description
<i>vrf-name</i>	VRF name.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide

This command is used to display the IPv6 unicast route dampening parameters configured for the BGP. The function and use of this command are similar to the **show bgp ipv4 unicast**

dampening parameters command. Please refer to the command.

Configuration

Examples N/A

Related Commands

Command	Description
show bgp ipv4 unicast dampening parameters	Displays the IPv4 unicast route dampening parameters configured for BGP.

Platform

Description None

5.150 show bgp ipv6 unicast neighbors

Use this command to display the related information of BGP IPv6 unicast neighbor.

show bgp ipv6 unicast [vrf *vrf-name*] neighbors *neighbor-address*

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name
<i>neighbor-address</i>	Neighbor IPv6 address.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Guide

This command is used to view the information of the connection with BGP IPv6 unicast neighbor. The function and use of this command are similar to the **show bgp ipv4 unicast neighbors *neighbor-address*** command. Please refer to the command.

Configuration

Examples N/A

Related Commands

Command	Description
show bgp ipv4 unicast neighbors <i>neighbor-address</i>	Displays the related information of BGP IPv4 unicast neighbor.

Platform

Description None

5.151 show bgp ipv6 unicast paths

Use this command to display the path information of the IPv6 unicast in the route database.

show bgp ipv6 unicast [vrf *vrf-name*] paths

	Parameter	Description
Parameter	<i>vrf-name</i>	VRF name

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is used to view the path information in the route database.

The following example displays the path information of the IPv6 unicast in the route database.

Configuration Examples

```
Orion_B54Q# show bgp ipv6 unicast paths
Address  Refcnt Path
[0x1d7806a0:0] (67)
[0x1d7389a0:13] (20) 10
```

	Command	Description
Related Commands	show bgp ipv4 unicast paths	Displays the path information of the IPv4 unicast in the route database.

Platform Description None

5.152 show bgp ipv6 unicast summary

Use this command to display the related information of BGP IPv6 unicast.

show bgp ipv6 unicast [vrf *vrf-name*] summary

	Parameter	Description
Parameter	<i>vrf-name</i>	VRF name.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is used to display the related information of BGP IPv6 unicast. The function and use of this command are similar to the **show bgp ipv4 unicast summary** command. Please refer to the command.

Configuration N/A

Examples

	Command	Description
Related Commands	router bgp	Enables the BGP protocol
	show bgp ipv4 unicast summary	Displays the related information of BGP IPv4 unicast.

Platform**Description** None**5.153 show bgp l2vpn**

Use the following command to display the BGP L2VPN routing information.

show bgp l2vpn { vpls | vpws } all

Use the following command to display the routing information of the BGP L2VPN address family of the *ve_id:offset*.

show bgp l2vpn { vpls | vpws } all ve_id:offset

Use the following command to display the neighbor information of the BGP L2VPN address family.

show bgp l2vpn { vpls | vpws } all neighbor [peer-address [policy [detail]]]

Use the following command to display the neighbor summary information of the BGP L2VPN address family.

show bgp l2vpn { vpls | vpws } all summary

Use the following command to display the L2VPN information on the specified RD.

show bgp l2vpn { vpls | vpws } rd vpn_rd [ve_id:offset]

Use the following command to display the L2VPN information on the specified VFI.

show bgp l2vpn { vpls | vpws } vfi vfi_name [ve_id:offset]

**Parameter
Description**

Parameter	Description
<i>vpls</i>	Displays VPLS information.
<i>vpws</i>	Displays VPWS information.
all	Displays all NLRI information that contains the VPLS instance or the VPWS instance.
<i>ve_id:offset</i>	Displays the VFI instance information of the specified <i>ve_id:offset</i>
neighbor [peer-address]	Displays the BGP L2VPN neighbor information. You can specify the specific neighbor information by entering the parameter <i>peer-address</i> . Otherwise all BGP L2VPN neighbor information is displayed.
neighbor peer-address policy	Displays the summarized routing policy information on BGP neighbor.

neighbor peer-address policy detail	Displays the detailed routing policy information BGP neighbor,
summary	Displays main BGP L2VPN information, including site ID, OFFSET, LABEL BASE and NEXT HOP.
rd vpn_rd	The specified RD.
vfi vfi_name	The specified VFI instance.

Defaults N/A

Command

Mode Privileged EXEC mode

Usage Use the command **show bgp l2vpn vpls** to display the VPLS information of local configuration, including Site ID, LABEL BASE and so on.

Configuration The following example displays all L2VPN VPLS address family routing information.

Examples

```
Orion_B54Q(config)# show bgp l2vpn vpls all
BGP table version: 4, local router ID is 172.168.201.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network      Next Hop      Metric   LocPrf   Path
Route Distinguisher: 45000:100
*> 2:0       0.0.0.0             ?
*> 100:3     172.168.201.2    0        100      ?
Route Distinguisher: 45000:200
*>01:10     0.0.0.0             0        32768    ?
*>i200:11   172.168.201.2    0        100      ?
```

The following example displays all L2VPN VPWS address family routing information.

```
Orion_B54Q(config)# show bgp l2vpn vpws all
BGP table version: 4, local router ID is 172.168.201.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network      Next Hop      Metric   LocPrf   Path
Route Distinguisher: 45000:100
*> 3:0       0.0.0.0             ?
*> 300:3     172.168.201.2    0        100      ?
Route Distinguisher: 45000:200
*>01:30     0.0.0.0             0        32768    ?
*>i300:11   172.168.201.2    0        200      ?
```

The following example displays the routing information of the BGP L2VPN address family of the

ve_id:offset.

```
Orion_B54Q(config)# show bgp l2vpn vpls all 4:0
BGP routing table entry for 100:100:4:0
  77 100
    192.168.250.77 from 192.168.250.77 (0.54.121.150)
      Origin IGP, metric 0, localpref 100, valid, external, best
      Extended Community: RT:1:200 RT:12345:11 SoO:12345:11
SoO:0.0.48.58:11 Unknown:12345:0:11 Layer2:5.0.1500
  ve id: 4 offset: 0 block size: 10 label base: 8196
  Last update: Wed Aug 19 04:06:17 1970
```

The following example displays the neighbor summary information of the BGP L2VPN VPLS peer group.

```
Orion_B54Q(config)# show bgp l2vpn vpls summary
BGP router identifier 192.168.250.8, local AS number 23
BGP table version is 1
 2 BGP AS-PATH entries
 0 BGP Community entries
 0 BGP Prefix entries (Maximum-prefix:4294967295)

Neighbor          V  AS  MsgRcvd  MsgSent  TblVer  InQ  OutQ  Up/Down
State/PfxRcd
192.168.250.77   4   77    6         5        1     0    0    00:01:55
11

Total number of neighbors
```

Command	Description
BGP table version	BGP table version.
Local Router ID	Local Router ID. Generally it is a loopback address.
status codes	Status codes: s :The route is dampened. d :Shielded route flap. h: Historical routes that no longer available * : Valid routes > : Optimal routes i : IGBP routes. r : Fails to install the RIB routing table. S: Old routes.
Origin Codes	Origin Codes: i: IGP. e: EGP.

	?: Incomplete.
Network	Routing information in the form aa:bb. The aa here represents site ID and the bb represents label model offset.
Next hop	Next hop IP address.
Metric	Metric value of the represent route (if be displayed.)
LocPrf	Local priority.
Path	AS path that reach the destination network.
Route Distinguisher	RD of VPLS.

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

5.154 show bgp l2vpn all connections

Use the following command to display connection information of the Kompella VPLS or the VPWS PW.

show bgp l2vpn { vpls | vpws } all connections [vfi vfi_name] [neighbor peer-address [policy [detail]] [site-id id] [detail]

Parameter	Description
vpls	Displays VPLS information.
vpws	Displays VPWS information.
vfi vfi_name	Displays PW information of the specified VFI instance.
neighbor [peer-address]	Displays information on the Kompella VFI PW connected with neighbor.
neighbor peer-address policy	Displays summarized routing policy information on the BGP neighbor.
neighbor peer-address policy detail	Displays detailed routing policy information on the BGP neighbor.
site-id id	Displays all connection information of all VFI instances of the specified site ID.
detail	Displays the detailed L2VPN connection information.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Use this command to display local configuration and the remote STA information on L2 VFI. If there is no remote STA, only local information is displayed.

The following example displays the PW connection information of the BGP L2VPN VPLS address family.

```
Orion_B54Q# show bgp l2vpn vpls all connections
vfi: vpls1 (VPLS: vpnid 1)
  Local Site: 1
  Connect-Site  Status  Neighbor  Remote-Label  local-Label
  2              up      2.2.2.2   1024          80000
  3              up      3.3.3.3   1025          9192
  4              up      4.4.4.4   1024          8192
vfi: vpls2 (VPLS: vpnid 2)
  Local Site: 1
  Connect-Site  Status  Neighbor  Remote-Label  local-Label
  2              up      2.2.2.2   1124          80001
  3              up      3.3.3.3   1125          9193
  4              down    4.4.4.4   --            --
Orion_B54Q# show bgp l2vpn vpws all connections
vfi: vpws1 (VPWS: vpnid 3)
  Local Site: 1
  Connect-Site  Status  Neighbor  Remote-Label  Local-Label
  5              up      2.2.2.2   1124          73728
  6              up      3.3.3.3   1125          73729
  7              up      4.4.4.4   1124          73730
```

Configuration Examples

Parameter	Description
vfi	Name of the VFI instance. (n) indicates the VPN ID of the VFI instance.
Local Site	Local site ID.
Connect-Site	Remote site ID.
Status	Whether the PW connection is up or down.
Neighbor	The PW neighbor's IP address.
Remote-Label	The PW remote tag (outbound tag).
Local-Label	The PW local tag (inbound tag).

The following example displays all VFI instance connection information of Site ID 1 of the L2VPN VPWS address family.

```
Orion_B54Q# show bgp l2vpn vpws all connections site 1 detail
vfi: vpws1 (VPWS:vpnid 1)
  Local site: 1
  Label-base      offset      range
  73728           1           10
```

```

73738          11          10
Remote site: 2 (connected)
  Neighbor address: 172.10.10.2
  Label-base      offset      range
  9000            1          10
  Incoming label: 73729, Outgoing label: 9000

Orion_B54Q# show bgp l2vpn vpls all connections site 1 detail
vfi: vpls1 (VPLS:vpnid 1)
  Local site: 1
  Label-base      offset      range
  8192            1          10
  8292            11         10
  Remote site: 2 (connected)
  Neighbor address: 172.10.10.2
  Label-base      offset      range
  9000            1          10
  Incoming label: 8193, Outgoing label: 9000
  Remote site: 25 (unconnected)
  Neighbor address: 172.10.10.3
  Label-base      offset      range
  10000           1          10
Incoming label: --, Outgoing label: --
    
```

Parameter	Description
vfi	Name of the VFI instance. (n) indicates the VPN ID of the VFI instance.
Local Site	Local site ID.
Label-base	Label block base.
Offset	Label block offset.
Range	The maximum number of connected sites.
Remote site	Remote site ID. One local site can be connected with multiple remote sites. Connected; The remote site is connected with the local site. Unconnected: The remote site is not connected with the local site.

**Related
Commands**

Command	Description
N/A	N/A

Platform

Description N/A

5.155 show bgp vpnv4 unicast

Use this command to display the VPN or neighbor information of all the VRFs or RDs.

show bgp vpnv4 unicast all [*network* | **neighbor** [| *address*] | **summary** | **label**]

show bgp vpnv4 unicast vrf *vrf_name* [*network* | **summary** | **label**]

show bgp vpnv4 unicast rd *rd_value* [*network* | **summary**| **label**]

Parameter Description

Parameter	Description
<i>network</i>	Network IP address
neighbor	Displays neighbor information.
summary	Displays the route summary information.
label	Displays the label information of routes.
<i>vrf_name</i>	VRF name
<i>rd_value</i>	RD value, for example, 100:1 or 202.118.239.165:1

Defaults N/A

Command

Mode Privileged EXEC mode

Usage

Guide This command is used to display the VPN information of all VRFs or RDs.

Configuration The following example displays the VPN or neighbor information of all the VRFs or RDs.

Examples

```
Orion_B54Q# show bgp vpnv4 unicast all
BGP table version is 0, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
      S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Route Distinguisher: 78:90 (Default for VRF this)
  Network  Next Hop  Metric  LocPrf  Path
*> 202.210.10.0  177.36.51.3    0    10  i
*>i208.208.1.0  192.168.195.183  0   100  i
*>i208.208.2.0  192.168.195.183  0   100  i
*> 211.158.0.0  0.0.0.0        0     i
*>i211.158.1.0  192.168.195.183  0   100  i
*> 212.210.0.0  0.0.0.0        0     i
*> 212.210.1.0  0.0.0.0        0     i
```

```
Total number of prefixes 7

Orion_B54Q# show bgp vpnv4 unicast vrf this summary
BGP router identifier 192.168.183.1, local AS number 23
BGP VRF this Route Distinguisher: 78:90
BGP table version is 1
2 BGP AS-PATH entries
1 BGP community entries
Neighbor  V AS MsgRcvd MsgSent  TblVer  InQ  OutQ  Up/Down  State/PfxRcd
177.36.51.2  4 10  0  0  0  0  0 never Active
177.36.51.3  4 10  85  87  1  0  0 01:12:25  5
Total number of neighbors 2
```

Related Commands	Command	Description
	N/A	N/A

Platform
Description N/A

5.156 show bgp vpnv6 unicast

Use this command to display the VPNv6 or neighbor information of all the VRFs or RDs.

show bgp vpnv6 unicast all [*network* | **neighbor** [[*address* [**policy** [**detail**]]]] | **summary** | **label**]

show bgp vpnv6 unicast vrf *vrf_name* [*network* | **summary** | **label**]

show bgp vpnv6 unicast rd *rd_value* [*network* | **summary**| **label**]

Parameter	Description
<i>network</i>	Network IP address
neighbor [<i>address</i>]	Displays the BGP VPNv6 neighbor information. All BGP VPNv6 neighbor information is displayed by default.
neighbor <i>address</i> policy	Displays the summarized BGP neighbor routing policy.
neighbor <i>address</i> policy detail	Displays the detailed BGP neighbor routing policy.
summary	Displays the route summary information.
label	Displays the route label information.
<i>vrf_name</i>	VRF name
<i>rd_value</i>	RD value, for example, 100:1 or 202.118.239.165:1.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide

Use this command to display the VRF that supports IPv6 address family or the VPNv6 routing information of the RD.

Configuration Examples

The following example displays all routing information of the VPNv6 address family.

```

Orion_B54Q# show bgp vpnv6 unicast all
BGP table version is 0, local router ID is 192.168.183.1
Status codes: s suppressed, d damped, h history, * valid, > best, i -
internal,
                S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete
Route Distinguisher: 78:90 (Default for VRF this)
  Network          Next Hop          Metric      LocPrf   Path
*> 10::/64         177.36.51.3       0           10      i
*>i10:1::/64       192.168.195.183   0           100     i
*>i10:2::/64       192.168.195.183   0           100     i
*> 10:3::/64       0.0.0.0           0           0       i
*>i10:4::/64       192.168.195.183   0           100     i
*> 10:5::/64       0.0.0.0           0           0       i
*> 10:6::/64       0.0.0.0           0           0       i
Total number of prefixes 7

Orion_B54Q# show bgp vpnv6 unicast vrf this summary
BGP router identifier 192.168.183.1, local AS number 23
BGP VRF this Route Distinguisher: 78:90
BGP table version is 1
2 BGP AS-PATH entries
1 BGP community entries
Neighbor      V   AS   MsgRcvd  MsgSent  TblVer  InQ  OutQ  Up/Down
State/PfxRcd
20::2         4   10     0        0        0     0    0     never
Active
20::3         4   10    85       87       1     0    0     01:12:25
5
Total number of neighbors 2
    
```

Parameter	Description
BGP table version	BGP table version.
Local Router ID	Local Router ID. Generally it is an IP address of a loopback interface.
status codes	Status codes: s :The route is dampened. d :Shielded route flap.

	<p>h: Historical routes that are no long available.</p> <p>* : Valid routes.</p> <p>> : Optimal routes.</p> <p>i : IBGP routes.</p> <p>r : Fails to install the RIB routing table.</p> <p>S: Old routes.</p>
Origin Codes	<p>Origin Codes:</p> <p>i: IGP.</p> <p>e: EGP.</p> <p>?: Incomplete.</p>
Route Distinguisher	<p>Routing information in the form aa: bb. The aa here represents site ID and the bb represents label model offset.</p>
Network	<p>Next hop IP address.</p>
Next hop	<p>Metric value of the represent route (if be displayed.)</p>
Metric	<p>BGP table version.</p>
LocPrf	<p>Local Router ID, usually it is an IP address of a loopback interface.</p>
Path	<p>The path to the destination AS,</p>

Related Commands

Command	Description
N/A	N/A

Platform

Description N/A

5.157 show ip bgp

Use this command to display the BGP IPv4 unicast address families' route information. The method of use is the same as other BGP show commands.

show ip bgp [*network* [*network-mask*] | **cidr-only** | **community** | **filter-list** | **community-list** | **regexp** | **quote-regexp** | **extcommunity-list** | **inconsistent-as** | **labels** | **prefix-list** | **route-map** | **scan**]

Display route flap's parameters.

show ip bgp dampening { **flap-statistics** | **dampened-paths** | **parameters** }

Display neighbors' related information.

show ip bgp neighbors *peer-address* [**received-routes** | **routes** | **advertised-routes**]

show ip bgp summary

Display directory information.

show ip bgp paths

Display related information under VRF.

show ip bgp vrf *vrf-name*

Parameter Description

Parameter	Description
<i>network</i>	Displays specific route information in the route table.
<i>network-mask</i>	Displays route information in the specific network.
cidr-only	Displays route information without specific category.
community <i>community-number</i>	Displays route information containing specific community value. The <i>community-number</i> is the group number. The format is AA:NN (autonomous system number/2-byte figure), or the following pre-defined value: internet, no-export, local-as or no-advertise.
community-list <i>community-name</i>	Displays the BGP route information of the specified community list. The <i>community-name</i> is the name of the community list.
dampening dampened-paths	Displays dampened route information.
dampening flap-statistics	Displays the route flap statistics.
dampening parameters	Displays believed route flap parameters.
extcommunity-list	Displays route information containing specific extcommunity value.
filter-list <i>path-list-number</i>	Displays the route information that complies with the filter list. The <i>path-list-number</i> is the marking number of the filter list.
inconsistent-as	Displays the route information of inconsistent source AS.
labels	Displays the IPv4 label route information.
neighbors <i>peer-address</i>	Displays the route information of BGP neighbors.
paths	Displays the route information in the route database.
prefix-list	Displays the route information that complies with the prefix list.
quote-regexp <i>regexp</i>	Displays the BGP route information of regular expression in the specified double quotation mark of the AS route attribute.
regexp <i>regexp</i>	Displays the BGP route information of specified regular expression of the AS route attribute.
route-map	Displays the route information that complies with the route map.
scan	Displays the BGP route scanning status.
summary	Displays related information of BGP neighbors.
vrf	Displays related information under BGP VRF.

Defaults

-

Command Mode

Privileged EXEC mode

Usage Guide

The **show ip bgp** command is the same as **show bgp ipv4 unicast** in terms of the function. All the parameters in **show bgp ipv4 unicast** apply to **show ip bgp**.

Configuration Examples

-

Configuration

Command	Description
---------	-------------

n Examples

show bgp ipv4 unicast	Displays IPv4 unicast route information in BGP route information.

Platform

-

Description

6 RIPng Commands

6.1 clear ipv6 rip

Use this command to clear the RIPng routes.

clear ipv6 rip

Parameter Description	Parameter	Description
	N/A	N/A

Defaults None

Command mode Privileged EXEC mode

Usage Guide Running this command removes all RIPng routes and this operation may have great impact on the RIPng protocol. This command should be used with caution.

Configuration Examples The following example clears the RIPng routes:

```
Orion_B54Q# clear ipv6 rip
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

6.2 default-metric

Use this command to configure the default metric for RIPng. Use the **no** form of this command to restore the default value.

default-metric metric

no default-metric

Parameter Description	Parameter	Description
	<i>metric</i>	Sets the default metric value. The valid range is from 1 to 16. The route is unreachable if the metric value is larger than or equal to 16.

Defaults 1

Command Routing process configuration mode.

mode

Usage Guide This command shall be used with the **redistribute** command. When redistributing the route from one route process to RIPng, due to the incompatibility of metric calculation mechanisms of different routing protocols, it fails to translate the routing metric values. To this end, the RIPng metric value shall be defined when translating the metric values. If there is no defined metric value, use the **default-metric** command to define one; and the defined metric value will overwrite the value of the **default-metric** command. By default, the **default-metric** value is 1.

Configuration Examples The following example redistributes the static route the RIP process and set the metric value to 3:

```
Orion_B54Q(config-router)# default-metric 3
Orion_B54Q(config-router)# redistribute static
```

Related Commands

Command	Description
redistribute	Redistributes the route from one route domain to another route domain.

Platform N/A
Description

6.3 distance

Use this command to set the administrative distance of RIPng. Use the **no** form of this command to restore the default value.

distance *distance*
no distance

Parameter Description

Parameter	Description
<i>distance</i>	Sets the RIPng administrative distance. The range is from 1 to 254.

Defaults 120

Command mode Routing process configuration mode.

Usage Guide N/A

Configuration Examples The following example sets the RIPng administrative distance as 160:

```
Orion_B54Q(config)# ipv6 router rip
Orion_B54Q(config-router)# distance 160
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

6.4 distribute-list

Use this command to filter the in/out route in the prefix list. Use the **no** form of this command to remove route filtering.

distribute-list prefix-list *prefix-list-name* { **in** | **out** } [*interface-type interface-name*]
no distribute-list prefix-list *prefix-list-name* { **in** | **out** } [*interface-type interface-name*]

Parameter Description

Parameter	Description
prefix-list <i>prefix-list-name</i>	Name of the prefix list which is used to filter the route.
in out	Filters the in or out route in the distribute list.
<i>interface-type interface-name</i>	(Optional) Applies the distribute list to the specified interface.

Defaults By default, no distribute list is defined.

Command mode Routing process configuration mode.

Usage Guide This command is used to configure the route distribution control list to filter all update routes for the purpose of refusing to receive or send the specified routes. If the interface is not specified, the update routes on all interfaces are filtered.

Configuration Examples The following example filters the received update route on the interface eth0 (only those update routes within the **prefix-list allowpre** prefix list range can be received)

```
Orion_B54Q(config)# ipv6 router rip
Orion_B54Q(config-router)# distribute-list prefix-list allowpre in eth0
```

Related Commands

Command	Description
redistribute	Sets route redistribution.

Platform N/A
Description

6.5 ipv6 rip default-information

Use this command to generate a default IPv6 route to the RIPng. Use the **no** form of this command to remove the default route.

ipv6 rip default-information { **only** | **originate** } [**metric** *metric-value*]
no ipv6 rip default-information

Parameter Description	Parameter	Description
	only	Advertises the IPv6 default route only.
	originate	Advertises both of the IPv6 default route and other routes.
	metric <i>metric-value</i>	Sets the metric value for the default route. The valid range is from 1 to 15. The default metric is 1.

Defaults By default, no default route is configured.

Command mode Interface configuration mode

Usage Guide With this command configured on an interface, the interface advertises an IPv6 default route and the route itself is not to join the device route forwarding table and the RIPng route database. To avoid the route loop, once this command has been configured on the interface, RIPng refuses to receive the default route update message advertised from the neighbor.

Configuration Examples The following example creates a default route to the RIPng routing process on the interface ethernet0/0 and enable this interface to advertise the default route only:

```
Orion_B54Q(config)# interface ethernet 0/0
Orion_B54Q(config-if)# ipv6 rip default-information only
```

Related Commands	Command	Description
	show ipv6 rip	Displays the RIPng process and statistics.
	show ipv6 rip database	Displays the RIPng route.

Platform Description N/A

6.6 ipv6 rip enable

Use this command to enable the RIPng on the interface. Use the **no** form of this command to disable RIPng on the interface.

- ipv6 rip enable**
- no ipv6 rip enable**

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command mode Interface configuration mode.

Usage Guide This command is used to add the RIPng interface. Before this command is configured, if the RIPng is not enabled, use this command to enable the RIPng automatically.

Configuration Examples The following example enables the RIPng on the interface 0/0:

```
Orion_B54Q(config)# interface ethernet 0/0
Orion_B54Q(config-if)# ipv6 rip enable
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

6.7 ipv6 rip metric-offset

Use this command to set the interface metric value. Use the **no** form of this command to remove the metric configurations.

```
ipv6 rip metric-offset value
no ipv6 rip metric-offset
```

Parameter Description

Parameter	Description
<i>value</i>	Sets the interface metric value on the interface. The valid range is from 1 to 16.

Defaults 1

Command mode Interface configuration mode.

Usage Guide Before the route is added to the routing list, the interface metric value shall be upon the route metric. To this end, the interface metric value influences the route usage.

Configuration Examples The following example sets the metric value of the interface Ethernet 0/1 as 5:

```
Orion_B54Q(config)# interface ethernet 0/1
Orion_B54Q(config-if)# ipv6 rip metric-offset 5
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

6.8 ipv6 router rip

Use this command to create the RIPng process and enter routing process configuration mode. Use the **no** form of this command to remove the RIPng process.

ipv6 router rip

no ipv6 router rip

Parameter Description	Parameter	Description
	N/A	N/A

Defaults No RIPng process is configured by default.

Command mode Global configuration mode.

Usage Guide N/A.

Configuration Examples The following example creates the RIPng process and enter routing process configuration mode:

```
Orion_B54Q(config)# ipv6 router rip
```

Related Commands	Command	Description
	ipv6 rip enable	Enables the RIPng on the specified interface.

Platform Description N/A

6.9 passive-interface

Use this command to disable the interface to send update packets. Use the **no** form of this command to enable the interface to send update packets.

passive-interface { **default** | *interface-type interface-num* }

no passive-interface { **default** | *interface-type interface-num* }

Parameter Description	Parameter	Description
	default	Enables the passive mode on all interfaces.
	<i>interface-type interface-num</i>	Interface type and interface number.

Defaults No passive interface is configured by default.

Command mode Routing process configuration mode.

Usage Guide You can use the **passive-interface default** command to enable the passive mode on all interfaces.

Then ,use the **no passive-interface** *interface-type interface-num* command to remove the specified interface from the passive mode.

Configuration Examples The following example enables the passive mode on all interfaces and remove interface ethernet 0/0 from the passive mode:

```
Orion_B54Q(config-router)# passive-interface default
Orion_B54Q(config-router)# no passive-interface ethernet 0/0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

6.10 redistribute

Use this command to redistribute the route of other routing protocols to RIPng. Use the **no** form of this command to remove the redistribution configuration.

redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static** } [**metric** *metric-value* | **route-map** *route-map-name*]

no redistribute { **bgp** | **connected** | **isis** [*area-tag*] | **ospf** *process-id* | **static** } [**metric** *metric-value* | **route-map** *route-map-name*]

Parameter Description

Parameter	Description
bgp	Redistributes the BGP routes to RIPng.
connected	Redistributes the connected routes to RIPng.
isis [<i>area-tag</i>]	Redistributes the ISIS routes to RIPng. <i>area-tag</i> indicates the ISIS process number.
ospf <i>process-id</i>	Redistributes the OSPF routes to RIPng. <i>process-id</i> indicates the OSPF process number, and the range is from 1 to 65,535.
static	Redistributes the static routes to RIPng.
metric <i>metric-value</i>	(Optional) Sets the metric value for the route redistributed to RIPng.
route-map <i>route-map-name</i>	(Optional) Sets the redistribution route filtering.

Defaults

By default, the routes of other routing protocols are not redistributed.
If the **default-metric** command is not configured, the default metric value is 1;
By default, the **route-map** is not configured;
By default, all sub-type routes in the specified routing process are redistributed.

Command mode

Routing process configuration mode.

Usage Guide This command is used to redistribute the external routes to RIPng. It is unnecessary to transform the metric of one routing protocol into another routing protocol in the process of the route redistribution, for the metric calculation methods of the different routing protocols are different. The RIP and OSPF metric calculations are incomparable for the reason that the RIP metric calculation is hop-based while the OSPF one is bandwidth-based. The instance, from where the routing information is redistributed to the RIPng, must be specified in the process of configuring the multi-instance protocol redistribution.

Configuration Examples The following example redistributes the static route, use the route map *mymap* to filter and set the metric value as 8:

```
Orion_B54Q(config)# ipv6 router rip
Orion_B54Q(config-router)# redistribute static route-map
mymap metric 8
```

Related Commands	Command	Description
	default-metric	Defines the default RIPng metric value when redistributing other routing protocols.
	distribute-list	Filters the RIPng routing update packets.

Platform N/A
Description

6.11 show ipv6 rip

Use this command to show the parameters and each statistical information of the RIPng routing protocol process.

show ipv6 rip

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command mode Privileged EXEC mode.

Usage Guide N/A

```
Orion_B54Q# show ipv6 rip
Routing Protocol is "RIPng"
  Sending updates every 10 seconds with +/-50%, next due in 8 seconds
  Timeout after 30 seconds, garbage collect after 60 seconds
  Outgoing update filter list for all interface is:
    distribute-list prefix aa out
```

```
Incoming update filter list for all interface is: not set
Default redistribution metric is 1
Default distance is 120
Redistribution:
    Redistributing protocol connected route-map rm
    Redistributing protocol static
    Redistributing protocol ospf 1
Default version control: send version 1, receive version 1
Interface          Send   Recv
    VLAN 1          1     1
    Loopback 1      1     1
Routing Information Sources:
    None
```

Related Commands	Command	Description
	show ipv6 rip	Displays the parameters and each statistical information of the RIPng process.

Platform N/A
Description

6.12 show ipv6 rip database

Use this command to display the RIPng route entries.

show ipv6 rip database

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command mode Privileged EXEC mode.

Usage Guide N/A

Configuration Examples

```
Orion_B54Q# show ipv6 rip database
Codes: R - RIPng,C - Connected,S - Static,O - OSPF,B - BGP
sub-codes:n - normal,s - static,d - default,r - redistribute,
          i - interface, a/s - aggregated/suppressed
S(r) 2001:db8:1::/64, metric 1, tag 0
      Loopback 0/::
S(r) 2001:db8:2::/64, metric 1, tag 0
```

```

        Loopback 0/::
C(r)   2001:db8:3::/64, metric 1, tag 0
        VLAN 1/::
S(r)   2001:db8:4::/64, metric 1, tag 0
        Null 0/::
C(i)   2001:db8:5::/64, metric 1, tag 0
        Loopback 1/::
S(r)   2001:db8:6::/64, metric 1, tag 0
        Null 0/::
    
```

Related Commands

Command	Description
N/A	N/A

Platform N/A
Description

6.13 split-horizon

Use the **split-horizon** command to enable the RIPng split-horizon function in routing process configuration mode. Use the **no** form of this command to disable this function. Use the **split-horizon poisoned-reverse** command to enable the RIPng poisoned reverse horizontal split function in routing process configuration mode. Use the **no** form of this command to disable this function.

- split-horizon poisoned-reverse**
- no split-horizon poisoned-reverse**

Parameter Description

Parameter	Description
poisoned-reverse	(Optional) Enables the poisoned-reverse horizontal split.

Defaults RIPng split horizon is enabled by default.

Command mode Routing process configuration mode.

Usage Guide In the process of packet updating, split-horizon function prevents some routing information from being advertised through the interface learning those routing information. The poisoned reverse horizontal split function advertises some routing information to the interface learning those routing information, and the metric value is set as 16. The RIPng routing protocol belongs to the distance vector routing protocol, so the horizontal split shall be noticed in the actual application. You can use the **show ipv6 rip** command to determine whether the RIPng split-horizon function is enabled or not.

Configuration Examples

The following example disables the RIPng horizontal split:

```

Orion_B54Q(config)# ipv6 router rip
Orion_B54Q(config-router)# no split-horizon
    
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

6.14 timers

Use this command to adjust the RIPng timer. Use the **no** form of this command to restore the default settings.

timers *update invalid flush*

no timers

Parameter Description	Parameter	Description
	<i>update</i>	Sets the routing update time, in seconds. The update parameter defines the period of sending the routing update packets by the device. The invalid and flush parameter reset once the update packets are received.
	<i>invalid</i>	Sets the routing invalid time, in seconds, starting from receiving the last valid update packet. The invalid parameter defines the invalid time for the un-updated routing in the routing list. The routing invalid time shall be three times larger than the routing update time. The routing will be invalid if no update packets are received within the routing invalid time, and it will reset if the update packets are received within the invalid time.
	<i>flush</i>	Sets the routing flush time, in seconds, starting from RIPng entering to invalid state. The invalid routing will be removed from the routing list if the flush time expires.

Defaults The default update time is 30 seconds; the default invalid time is 180 seconds; and the default flush time is 120 seconds.

Command mode Routing process configuration mode.

Usage Guide Adjusting the above time may speed up the RIPng convergence time and the troubleshooting time. The RIPng time must be consistent for the devices connecting to the same network. You are not recommended to adjust the RIP time, except for the specific requirement.

Use the **show ipv6 rip** command to view the current RIPng time parameter setting.

In the low-speed link, with the short time configured, large amount of the update packets consumes a lot of bandwidth. Generally, the short time can be configured in the Ethernet or 2Mbps-higher line

to shorten the convergence time of the network routing.

Configuration Examples The following example sends the RIP update packets every 10 seconds. The routing will be invalid if no update packets are received within 30 seconds, and the routing will be removed after being invalid for 90 seconds.

```
Orion_B54Q(config)# ipv6 router rip
Orion_B54Q(config-router)# timers 10 30 90
```

Related Commands

Command	Description
show ipv6 rip	Displays the parameters and the statistical information of the RIPng process.
show ipv6 rip database	Displays the RIPng routes.

Platform N/A

Description

7 NSM Commands

7.1 clear ip mroute

Use this command to clear the route cache.

```
clear ip route [ vrf vrf_name ] { * | network [ netmask ] }
```

Parameter description

Parameter	Description
vrf vrf_name	(Optional) Specifies the route cache of the specified VRF instance. If no VRF is specified, the route cache of all VRF instances is cleared.
*	Clears all route cache.
network	Specifies the route cache of the network or subnet.
netmask	(Optional) Subnet mask. If no subnet mask is specified, the longest match principle is used when you match <i>network</i> with the route. The cache of the longest match is cleared.

Command mode Privileged EXEC mode.

Usage guidelines Clearing route cache clears the corresponding routes and triggers the routing protocol relearning. Please note that clearing all route cache leads to temporary network disconnection.

Examples The following example clears the cache of the route which is the longest match with IP address 192.168.12.0.

```
clear ip route 192.168.12.0
```

Related commands

Command	Description
N/A	N/A

Platform

description This command is not supported on layer 2 devices.

7.2 ip default-network

Use this command to configure the default network globally. Use the **no** form of this command to restore the default setting.

ip default-network *network*

no ip default-network *network*

Parameter

Parameter	Description
description <i>network</i>	Default network

Default configuration The default is 0.0.0.0/0.

Command mode Global configuration mode.

Usage guidelines The goal of this command is to generate the default route. The default network must be reachable in the routing table, but not the directly connected network.

The default network always starts with an asterisk (**), indicating that it is the candidate of the default route. If there is connected route and the route without the next hop in the default network, the default route must be a static route.

The following example sets 192.168.100.0 as the default network. Since the static route to the network is configured, the device will automatically generate a default route.

```
ip route 192.168.100.0 255.255.255.0 serial 0/1
ip default-network 192.168.100.0
```

Examples

The following example sets 200.200.200.0 as the default network. The route becomes the default one only when it is available in the routing table.

```
ip default-network 200.200.200.0
```

Related commands

Command	Description
show ip route	Displays the routing table.

7.3 ip fast-reroute route-map

Use this command to enable static fast reroute. Use the **no** form of this command to restore the default setting.

ip fast-reroute [vrf *vrf-name*] **static route-map** *route-map-name*
no ip fast-reroute [vrf *vrf-name*]

Parameter	Parameter	Description
description	vrf <i>vrf-name</i>	VRF.
	route-map <i>route-map-name</i>	Route map.
	static	Backup route.

Default This function is disabled by default.

Command mode Global configuration mode.

Usage guideline Fast reroute provides an active next-hop and a backup one. If the active next-hop fails, the backup next-hop is used for forwarding.

To enhance the performance of fast reroute, enable the BFD detection function for the active next-hop. For interfaces that are up or down, to shorten the interruption time of fast reroute, configure **carrier-delay 0** in the interface configuration mode of the active outbound interface to optimize the performance.

For static fast reroute, if the active next-hop fails, the backup next-hop is used for forwarding.

Examples The following example sets the backup next-hop of all static routes to 192.168.1.2 through the outbound interface of GigabitEthernet 0/1.

```
Orion_B54Q(config)# route-map fast-reroute
Orion_B54Q(config-route-map)# set fast-reroute backup-nexthop
GigabitEthernet 0/1 192.168.1.2
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# ip fast-reroute static route-map fast-reroute
```

Related command	Command	Description
	fast-reroute	Configures OSPF fast reroute.

Platform description N/A

7.4 ip route

Use this command to configure a static route. Use the **no** form of this command to restore the default setting.

ip route [vrf *vrf_name*] *network net-mask* {*ip-address* | *interface [ip-address]*} [*distance*] [**tag tag**] [**permanent**] [**weight number**] [**disable** | **enable**]

no ip route [**vrf** *vrf_name*] **network** *net-mask* {*ip-address* | *interface* [*ip-address*]} [*distance*] [**tag** *tag*] [**permanent**] [**weight** *number*] [**disable** | **enable**]

Parameter description

Parameter	Description
<i>vrf-name</i>	Name of the VRF, which can be the single protocol IPv4 VRF or configured IPv4 address family multi-protocol VRF.
<i>network</i>	Network address of the destination
<i>net-mask</i>	Mask of the destination
<i>ip-address</i>	The next hop IP address of the static route
<i>interface</i>	(Optional) The next hop egress of the static route
<i>distance</i>	(Optional) The administrative distance of the static route
<i>tag</i>	(Optional) The tag of the static route
<i>permanent</i>	(Optional) Permanent route ID
<i>number</i>	(Optional) Weight number of the static route
disable/enable	(Optional) Disablement or enablement ID of the static route

Default configuration

No static route is configured by default.

Command mode

Global configuration mode

Usage guidelines

The default administrative distance of the static route is 1. Setting the administrative distance allows the learnt dynamic route to overwrite the static route. Setting the administrative distance of the static route can enable route backup, which is called floating route in this case. For example, the administrative distance of the OSPF is 110. You can set its administrative distance to 125. Then the data can switch over the static route when the route running OSPF fails.

You can specify the VRF that the static route belongs to. The default weight of the static route is 1. To view the static route of non default weight, execute the show ip route weight command. The parameter weight is used to enable WCMP. When there are load-balanced routes to the destination, the device assigns data flows by their weights. The higher the weight of a route is, the more data flows the route carries. WCMP limit is generally 32 for routers. However, WCMP limit varies by switch models for their chipsets support different weights. When the sum of the weights of load balanced routes is beyond this weight limit, the excessive ones will not take effect.

Enablement/disablement shows the state of the static route. Disablement means the static route is not used for forwarding. The forwarding table used the permanent route until administrator deletes it.

When you configure the static route on an Ethernet interface, do not set the next hop as an interface, for example, ip route 0.0.0.0 0.0.0.0 Fastethernet 0/0. In this case, the switch may consider that all unknown destination networks are directly connected to the Fastethernet 0/0. So it sends an ARP request to every destination host, which occupies

many CPU and memory resources. It is not recommended to set the static route to an Ethernet interface.

The following example adds a static route to the destination network of 172.16.100.0/24 whose next hop is 192.168.12.1 and administrative distance is 15.

```
ip route 172.16.199.0 255.255.255.0 192.168.12.1 155
```

Examples

If the static route has not a specific interface, data flows may be sent thought other interface in case of interface failure. The following example configures data flows to be sent through fastethernet 0/0 to the destination network of 172.16.100.0/24.

```
ip route 172.16.199.0 255.255.255.0 fastethernet 0/0 192.168.12.1
```

Related commands This command is not supported on layer 2 devices.

7.5 ip route static bfd

Use this command to correlate the static route with BFD. Use the **no** or **default** form of this command to restore the default setting.

ip route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

no ip route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

default ip route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

Parameter description

Parameter	Description
vrf <i>vrf-name</i>	(Optional) Specifies the VRF name of the static route. By default, it is global VRF,
<i>interface-type interface-number</i>	Interface type and interface number.
<i>gateway</i>	Specifies the gateway IP address, that is, the BFD neighbor IP address. If the next hop of the static route is the neighbor, the BFD will detect whether this neighbor is reachable.
source <i>ip-address</i>	(Optional) The source IP address of the BFD session. If the neighbor device is multi hops away, you should specify the source IP address for the BFD session. No source IP address is specified by default.


Default configuration

The static address is not correlated with BFD by default.

Command mode

Global configuration mode.

Usage guidelines

 Please make sure the BFD session parameters have been configured before executing this command.

The following example correlates the static route with BFD, and detects the reachability of path to the neighbor 172.16.0.2.

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if-GigabitEthernet 0/1)# no switchport // No
need to perform this command on the router.
Orion_B54Q(config-if-GigabitEthernet 0/1)# ip address 172.16.0.1
255.255.255.0
Orion_B54Q(config-if-GigabitEthernet 0/1)# bfd interval 50 min_rx
50 multiplier 3
Orion_B54Q(config-if-GigabitEthernet 0/1)#exit
Orion_B54Q(config)# ip route static bfd GigabitEthernet 0/1
172.16.0.2
Orion_B54Q(config)# ip route 10.0.0.0 255.0.0.0 GigabitEthernet 0/1
172.16.0.2
```

Examples

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.6 ip route static inter-vrf

Use this command to enable packets to be forwarded over VRF instances through the static route. Use the **no** or **default** form of this command to disable this function.

ip route static inter-vrf

no ip route static inter-vrf

default ip route static inter-vrf

Parameter	Parameter	Description
description	N/A	N/A

Default configuration This function is enabled by default.

Command mode Global configuration mode.

Usage guidelines If the **no** form of this command is executed, packets are unable to be forwarded over VRF instances through the static route. If this command is executed and you want to use the **no** form of this command to disable such function, the following information will be displayed.

```
*Aug 7 10:58:34: %NSM-6-ROUTESACROSSVRF: Un-installing route
[x.x.x.x/8] from global routing table with outgoing interface x/x.
```

Examples The following example disables packets to be forwarded over VRF instances through the

static route.

```
Orion_B54Q(config)# no ip route static inter-vrf
```

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.7 ip routing

Use this command to enable IP routing in the global configuration mode. Use the **no** form of this command to disable this function.

ip routing

no ip routing

Default configuration This function is enabled by default.

Command mode Global configuration mode.

Usage guidelines IP routing is not necessary when the switch serves as bridge or VoIP gateway.

Examples The following example disables IP routing.

```
no ip routing
```

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.8 ip static route-limit

Use this command to set the upper threshold of the static route. Use the **no** form of this command to restore the default setting.

ip static route-limit *number*

no ip static route-limit *number*

Parameter	Parameter	Description
description	<i>number</i>	Upper threshold of static routes

Default configuration The default is 1024.

Command mode Global configuration mode.

Usage guidelines The goal is to control the number of static routes. You can view the upper threshold of the configured non-default static routes with the show running config command.

Examples The following example sets the upper threshold of the static routes to 900 and then restores the setting to the default value.

```
ip static route-limit 900
```

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.9 ipv6 route

Use this command to configure an ipv6 static route. Use the **no** form of this command to restore the default setting.

ipv6 route [vrf *vrf-name*] *ipv6-prefix/prefix-length* {*ipv6-address* [**nexthop-vrf** {*vrf-name1* | **default** }] | *interface* [*ipv6-address* [**nexthop-vrf** {*vrf-name1* | **default** }]]] [*distance*] [**tag** *tag*] [**weight** *number*]

no ipv6 route [vrf *vrf-name*] *ipv6-prefix/prefix-length* {*ipv6-address* [**nexthop-vrf** {*vrf-name1* | **default** }] | *interface* [*ipv6-address* [**nexthop-vrf** {*vrf-name1* | **default** }]]] [*distance*] [**tag** *tag*] [**weight** *number*]

Parameter description

Parameter	Description
<i>network</i>	Network address of the destination
<i>vrf-name</i>	Name of VRF, which must be the configured IPv6 address family multi-protocol VRF.
<i>prefix-length</i>	Mask length of the destination
<i>ipv6-address</i>	The next hop IP address of the static route
<i>interface</i>	(Optional) The next hop egress of the static route
<i>vrf-name1</i>	VRF the nexthop belongs, which must be the configured IPv6 address family multi-protocol VRF.
<i>distance</i>	(Optional) The administrative distance of the static route. The default is 1.
<i>tag</i>	(Optional) The tag value of the static route. The default is 0.
<i>number</i>	(Optional) The weight value of the static route, which is specified when configuring the equivalent routes, in range of 1 to 128. The sum of the weight of all equivalent paths of one route could not exceed the number of the configurable maximum equivalent paths. The weight ratio between the equivalent routes of the same route shows the flow rate between these paths.

Default configuration

No IPv6 static route is configured by default.

Command mode Global configuration mode.

When the multi-protocol VRF deletes the IPv6 address family, the IPv6 static route of VRF that the route or nexthop belongs is deleted.

If the VRF of the IPv6 static route interface is not same as the nexthop's VRF, then this IPv6 static route takes no effect.

Usage guidelines

The default administrative distance of the static route is 1. Setting the administrative distance allows the learnt dynamic route to overwrite the static route. Setting the administrative distance of the static route can enable route backup, which is called floating route in this case. For example, the administrative distance of the OSPF is 110. You can set its administrative distance to 125. Then the data can switch over the static route when the route running OSPF fails.

The following example adds a static route to the destination network of 2001::/64 whose next hop is 2002::2 and administrative distance is 115.

```
ipv6 route 2001::/64 2002::2 115
```

Examples

If the static route has not a specific interface, data flows may be sent thought other interface in case of interface failure. The following example configures that data flows are sent through fastethernet 0/0 to the destination network of 2001::/64.

```
ipv6 route 2001::/64 fastethernet 0/0 2002::2
```

Related commands

Command	Description
show ipv6 route	Displays IPv6 routing table.

Platform description This command is not supported on Layer 2 devices.

7.10 ipv6 route static bfd

Use this command to correlate the static route with BFD. Use the **no** or **default** form of this command to restore the default setting.

ipv6 route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

no ipv6 route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]

default ipv6 route static bfd [vrf *vrf-name*] *interface-type interface-number gateway* [**source** *ip-address*]


Parameter description

Parameter	Description
vrf <i>vrf-name</i>	(Optional) Specifies the VRF name of the static route. By default, it is global VRF,
<i>interface-type interface-number</i>	Interface type and interface number.
<i>gateway</i>	Specifies the gateway IP address, that is, the BFD neighbor IP address. If the next hop of the static route is the neighbor, the BFD will detect whether this neighbor is

	reachable.
source <i>ipv6-address</i>	(Optional) The source IP address of the BFD session. If the neighbor device is multi hops away, you should specify the source IP address for the BFD session. No source IP address is specified by default.

Default configuration The static route is not associated with BFD by default.

Command mode Global configuration mode.

Usage guidelines  Please make sure the BFD session parameters have been configured before executing this command.

The following example correlates the static route with BFD, and detects the reachability of path to the neighbor `2001:1::2`.

```
Orion_B54Q(config)# interface GigabitEthernet 0/1
Orion_B54Q(config-if)# no switchport //
Orion_B54Q(config-if)# ip address 2001:1::1/64
Orion_B54Q(config-if)# bfd interval 50 min_rx 50 multiplier 3
Orion_B54Q(config-if)# exit
Orion_B54Q(config)# ipv6 route static bfd GigabitEthernet 0/1
2001:1::2
Orion_B54Q(config)# ipv6 route 2002::/64 GigabitEthernet 0/1
2001:1::2
```

Examples

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.11 ipv6 static route-limit

Use this command to set the upper threshold of the static route. Use the **no** form of this command to restore the default setting.

ipv6 static route-limit *number*

no ipv6 static route-limit *number*

Parameter description

Parameter	Description
<i>number</i>	Upper threshold of static routes in the range from 1 to 10000.

Default The default is 1000.

configuration

Command mode Global configuration mode.

Usage guidelines

The goal is to control the number of static routes. You can view the upper threshold of the configured non-default static routes with the show running config command.

Examples

The following example sets the upper threshold of the ipv6 static routes to 900 and then restores the setting to the default value.

```
Orion_B54Q# ipv6 static route-limit 900
Orion_B54Q# no ipv6 static route-limit
```

Related commands

Command	Description
ipv6 route	Configures the IPv6 static route.
show ipv6 route	Displays the IPv6 routing table

Platform description

This command is not supported on Layer 2 devices.

7.12 ipv6 unicast-routing

Use this command to enable the IPv6 route function of the NOS. Use the **no** form of this command to disable this function.

ipv6 unicast-routing

no ipv6 unicast-routing

Parameter**description**

None

Default**configuration**

This function is enabled by default.

Command mode

Global configuration mode

Usage guidelines

This function can be disabled if the device is just used as the bridge-connection device or the VOIP gateway device.

Examples

The example disables the IPv6 route function of NOS.

```
Orion_B54Q# no ipv6 unicast-routing
```

Related commands

Command	Description
ipv6 route	Configure the IPv6 static route
show ipv6 route	Displays the IPv6 routing table

Platform description This command is not supported on Layer 2 devices.

7.13 maximum-paths

Use this command to specify the number of equivalent routes. Use the **no** form of this command is used to restore the default setting.

maximum-paths *number*
no maximum-paths *number*

Parameter	Parameter	Description
description	<i>number</i>	Number of equivalent routes in the range from 1 to 32

Default configuration The default is 32 for routers. For switches, it depends on switch models.

Command mode Route map configuration mode.

Usage guidelines With this command executed, the number of routes for load balancing is no more than the specified number of equivalent routes. You can view the number of equivalent routes with the show running config command.

Examples The following example sets the number of equivalent routes to 10 and then restores the default setting.

```
maximum-paths 10
no maximum-paths 10
```

7.14 show ip route

Use the command to display the configuration of the IP routing table.

show ip route [[vrf *vrf_name*] [*network* [*mask* [**longer-prefix**]] | **count** | *protocol* [*process-id*] | **weight**]]

show ip route [vrf *vrf-name*] [[**normal** | **ecmp** | **fast-reroute**] [*network* [*mask*]]

Parameter	Description
<code>vrf vrf_name</code>	(Optional) Displays the route information of the VRF.
<code>network</code>	(Optional) Displays the route information to the network.
<code>mask</code>	(Optional) Displays the route information to the network of this mask.
<code>longer-prefix</code>	(optional) Displays the routes that match the specified prefix.
<code>count</code>	(Optional) Displays the number of existent routes. (for the ECMP/WCMP route, displays one route)
<code>protocol</code>	(Optional) Displays the route information of specific protocol.
<code>process-id</code>	(Optional) Routing protocol process ID.
<code>weight</code>	(Optional) Displays the route information of non default weight.
<code>normal</code>	Displays normal routes and not equivalent routes or fast reroutes.
<code>ecmp</code>	Displays only equivalent routes.
<code>fast-reroute</code>	(Optional) Displays the master/standby route of fast reroute.

Parameter description

Default configuration

All routes are displayed by default.

Command mode

Privileged EXEC mode/ global configuration mode/ interface configuration mode/ routing protocol configuration mode/ route map configuration mode.

Usage guidelines

This command can display route information flexibly.
 This command shows all routes. To show different attributes of routes, specify `normal | ecmp | fast-reroute`.

The following example displays the configuration of the IP routing table.

Examples

```

Orion_B54Q# show ip route

Codes: C - Connected, L - Local, S - Static
       R - RIP, O - OSPF, B - BGP, I - IS-IS, V - Overflow route
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       SU - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
       IA - Inter area, * - candidate default

Gateway of last resort is no set
S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN 1
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN 1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host.
    
```

Field	Description
O	Source routing protocol, which may be: C: directly connected route S: static route R: RIP route B: BGP route O: OSPF route I: IS-IS route
E2	Route type, which may be: E1: OSPF external route type 1 E2: OSPF external route type 2 N1: OSPF NSSA external type 1 N2: OSPF NSSA external type 2 IA: OSPF area internal route SU: IS-IS summary route L1: IS-IS level-1 route L2: IS-IS level-2 route IA: IS-IS area internal route
20.0.0.0/8	Network address and mask of the destination network
[1/0]	Administrative distance/metric

```
Orion_B54Q# show ip route 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF, extern 2
```

Field	Description
Routing Descriptor Blocks	Next hop IP address, source, update time, forwarding interface, source routing protocol and type of route information

```
Orion_B54Q# show ip route count
----- route info -----
the num of active route: 5
```

```
Orion_B54Q# show ip route weight
-----[distance/metric/weight]-----
S    23.0.0.0/8 [1/0/2] via 192.1.1.20
S    172.0.0.0/16 [1/0/4] via 192.0.0.1
```

```
Orion_B54Q#show ip route normal

Codes:  C - Connected, L - Local, S - Static
        R - RIP, O - OSPF, B - BGP, I - IS-IS, V - Overflow route
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        SU - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        IA - Inter area, * - candidate default

Gateway of last resort is no set

S    20.0.0.0/8 is directly connected, VLAN 1
S    22.0.0.0/8 [1/0] via 20.0.0.1
O E2 30.0.0.0/8 [110/20] via 192.1.1.1, 00:00:06, VLAN 1
R    40.0.0.0/8 [120/20] via 192.1.1.2, 00:00:23, VLAN 1
B    50.0.0.0/8 [120/0] via 192.1.1.3, 00:00:41
C    192.1.1.0/24 is directly connected, VLAN 1
C    192.1.1.254/32 is local host
```

```
Orion_B54Q#show ip route ecmp

Codes:  C - Connected, L - Local, S - Static
        R - RIP, O - OSPF, B - BGP, I - IS-IS, V - Overflow route
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        SU - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        IA - Inter area, * - candidate default

Gateway of last resort is 192.168.1.2 to network 0.0.0.0

S*   0.0.0.0/0 [1/0] via 192.168.1.2
           [1/0] via 192.168.2.2
O IA 192.168.10.0/24 [110/1] via 35.1.10.2, 00:38:26, VLAN 1
           [110/1] via 35.1.30.2, 00:38:26, VLAN 3
```

```
Orion_B54Q#show ip route fast-reroute

Codes:  C - Connected, L - Local, S - Static
        R - RIP, O - OSPF, B - BGP, I - IS-IS, V - Overflow route
```

```

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
SU - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
IA - Inter area, * - candidate default
Status codes: m - main entry, b - backup entry, a - active entry

Gateway of last resort is 192.168.1.2 to network 0.0.0.0
S*   0.0.0.0/0 [ma] via 192.168.1.2
           [b] via 192.168.2.2
O IA 192.168.10.0/24 [m] via 35.1.10.2, 00:38:26, VLAN 1
           [ba] via 35.1.30.2, 00:38:26, VLAN 3
    
```

```

Orion_B54Q# show ip route fast-reroute 30.0.0.0
Routing entry for 30.0.0.0/8
Distance 110, metric 20
Routing Descriptor Blocks:
[m] 192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF, extern
2
[ba]192.1.1.1, 00:01:11 ago, via VLAN 1, generated by OSPF, extern
2
    
```

7.15 show ip route static bfd

Use this command to display the IP route correlated BFD information

show ip route [**vrf vrf_name**] **static bfd**

Parameter	Parameter	Description
description	vrf vrf-name	(Optional) Displays route information of the specified VRF. The default is global VRF.

Default configuration N/A

Command mode Privileged EXEC mode.

Usage guidelines Use this command to display the IP route correlated BFD information

Examples The following example displays the IP route correlated BFD information,

```

Orion_B54Q(config)#show ip route static bfd
S   10.0.0.0/8 via 100.100.100.25, GigabitEthernet 0/3, BFD state
is Up
    
```

```
S      20.0.0.0/8 via 200.100.100.25, GigabitEthernet 0/4, BFD state
is Admin
```

Field	Description
S	Static route
BFD state	State of the static route correlated BFD.

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.16 show ip route summary

Use this command to display the statistical information about one routing table.

show ip route [vrf vrf_name] summary

Use this command to display the statistical information about all routing tables.

show ip route summary all

Parameter	Parameter	Description
description	<i>vrf-name</i>	VRF name

Default

configuration N/A

Command mode Privileged EXEC mode

Usage guideline N/A

Examples

The following example displays the statistics of the global routing table.

```

Orion_B54Q# show ip route summary
Codes: NORMAL - Normal route ECMP - ECMP route FRR - Fast-Reroute route

Memory: 2000 bytes
Entries: 22,based on route prefixes
          NORMAL ECMP FRR TOTAL
Connected 3 0 0 3
Static 2 1 1 4
RIP 1 2 1 4
OSPF 2 1 1 4
ISIS 1 2 0 3
BGP 2 1 1 4
TOTAL 11 7 4 22

```

The following example displays the statistics of all routing tables.

```

Orion_B54Q# show ip route summary all
Codes: NORMAL - Normal route ECMP - ECMP route FRR - Fast-Reroute route

IP routing table count:2
Total
Memory: 4000 bytes
Entries: 44,based on route prefixes
          NORMAL ECMP FRR TOTAL
Connected 6 0 0 6
Static 4 2 2 8
RIP 2 4 2 8
OSPF 4 2 2 8
ISIS 2 4 0 6
BGP 4 2 2 8
TOTAL 22 14 8 44

Global
Memory: 2000 bytes
Entries: 22,based on route prefixes
          NORMAL ECMP FRR TOTAL
Connected 3 0 0 3
Static 2 1 1 4
RIP 1 2 1 4
OSPF 2 1 1 4
ISIS 1 2 0 3
BGP 2 1 1 4
TOTAL 11 7 4 22

```

```

VRF1
Memory: 2000 bytes
  Entries: 22, based on route prefixes
          NORMAL ECMP FRR TOTAL
Connected 3 0 0 3
Static 2 1 1 4
RIP 1 2 1 4
OSPF 2 1 1 4
ISIS 1 2 0 3
BGP 2 1 1 4
TOTAL 11 7 4 22
    
```

Field	Description
NORMAL	Type of the table entries. Value: NORMAL: common routes (not ECMP or FRR); ECMP: equivalent route; FRR: fast reroute; TOTAL: total
Memory	Memory occupied by the table.
Entries	Number of entries (based on prefix, not next-hop)
Connected	Protocol type. Value: Connected: direct connection; Static: static; RIP: RIP; OSPF: OSPF; ISIS: ISIS; BGP: BGP; TOTAL: total
IP routing table count	Number of routing tables.
Global	Routing table name. Value: Global: (default VRF). VRF1: VRF name. TOTAL: total VRF routing table information.

7.17 show ipv6 route

Use the command to display the configuration of the IPv6 routing table.

show ipv6 route [vrf vrf-name] [[network / prefix-length] | **summary** | protocol] **weight**

Parameter description

Parameter	Description
<i>network</i>	(Optional) Displays the route information to the network.
<i>vrf-name</i>	VRF name.
summary	(Optional)Displays the classified statistics of the number of ipv6 routes.
<i>protocol</i>	((Optional) Displays the route information of specific protocol.
<i>weight</i>	(Optional) Displays the non-default-weight routes only.

Default configuration

All routes are displayed by default.

Command mode

Privileged EXEC mode/ global configuration mode, interface configuration mode/ routing protocol configuration mode/ route map configuration mode.

Usage guidelines

Use this command to display route information flexibly.

Examples

The following example displays the output of this command.

```
Orion_B54Q(config)# show ipv6 route

IPv6 routing table - Default - 7 entries
Codes: C - Connected, L - Local, S - Static
       R - RIP, O - OSPF, B - BGP, I - IS-IS, V - Overflow
route
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       SU - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS
level-2
       IA - Inter area

C    10::/64   via Loopback 1, directly connected
L    10::1/128 via Loopback 1, local host
S    20::/64   [20/0] via 10::4, Loopback 1C
C    FE80::/10 via Null 0, directly connected
C    FE80::/64 via Loopback 1, directly connected
L    FE80::2D0:F8FF:FE22:33AB/128 via Loopback 1, local host
```

Field	Description
-------	-------------

O	Source routing protocol, which may be: C: directly connected route S: static route R: RIP route B: BGP route O: OSPF route I: IS-IS route
E2	Route type, which may be: E1: OSPF external route type 1 E2: OSPF external route type 2 N1: OSPF NSSA external type 1 N2: OSPF NSSA external type 2 IA: OSPF area internal route SU: IS-IS summary route L1: IS-IS level-1 route L2: IS-IS level-2 route IA: IS-IS area internal route
20::/64	Network address and mask of the destination network
[20/0]	Administrative distance/metric

Related commands

Command	Description
ipv6 route	Configures the IPv6 static route.

Platform description

This command is not supported on Layer 2 devices.

7.18 show ip route static bfd

Use this command to display the IPv6 route correlated BFD information

show ipv6 route [[vrf vrf_name] static bfd

Parameter description

Parameter	Description
vrf vrf-name	(Optional) Displays the route information of the designated VRF name of the static route. The default is global VRF,

Default configuration

N/A

Command mode

Privileged EXEC mode.

Usage guidelines

Use this command to display the IPv6 route correlated BFD information.

The following example displays the IPv6 route correlated BFD information.

```
Orion_B54Q(config)#show ip route static bfd
S      25::/64 via 100::25, GigabitEthernet 0/3, BFD state is Up
S      26::/64 via 200::25, GigabitEthernet 0/4, BFD state is Admin
```

Examples

Field	Description
S	Static route
BFD state	State of the static route associated BFD

Related commands N/A

Platform description This command is not supported on Layer 2 devices.

7.19 show ipv6 route summary

Use this command to display the statistics of the IPv6 routing table of a specified VRF.

show ipv6 route [vrf vrf-name] summary

Use this command to display statistics of all IPv6 routing tables.

show ipv6 route summary all

Parameter	Description
<i>vrf-name</i>	(Optional) VRF name. If no VRF name is specified, statistics of the IPv6 routing table of the global VRF are displayed.

Default configuration N/A

Command mode Privileged EXEC mode.

Usage guidelines N/A

Examples The following example displays statistics of IPv6 routing table of the global VRF.

```
Orion_B54Q#show ipv6 route summary
IPv6 routing table name is - Default(0) global scope - 5
entries
IPv6 routing table default maximum-paths is 32
Local          2
Connected     3
Static         0
PIP            0
```

```

OSPF          0
BGP           0
-----
Total        5
    
```

The following example displays t statistics of all IPv6 routing tables.

```

Orion_B54Q#show ipv6 route summary
IPv6 routing table name is - Default(0) global scope - 5
entries
IPv6 routing table default maximum-paths is 32
Local          2
Connected      3
Static         0
PIP            0
OSPF           0
BGP            0
-----
Total          5
    
```

Field	Description
Memory	The memory size occupied by the current routing table.
Entries	The entries in the current routing table (based on the entry prefix instead of the next hop entry.)
Connected	Describes the protocol type of the entry. The field can be; Connected: Connected route entry. Static: Static route entry. RIP: RIP route entry. OSPF: OSPF route entry. ISIS: ISIS route entry. BGP: BGP route entry. TOTAL: Total number of all protocol entries.
IPv6 routing table count	The number of the routing tables.
Global	The name of the current routing table. The field can be: Global : Global (The default VRF) VRF1: VRF name. TOTAL: All VRF routing table summary.

Related commands

Command	Description
N/A	N/A

Platform description This command is not supported on Layer 2 devices.

8 Protocol-independent Configuration Commands

8.1 accept-lifetime

Use this command in the encryption key configuration mode to specify the lifetime of an encryption key in its receiving direction. Use the no form of this command to restore the default value.

accept-lifetime *start-time* {infinite | end-time | duration seconds}

no accept-lifetime

Parameter description	Parameter	Description
	<i>start-time</i>	Start time of the lifetime. The syntax is as follows: <i>hh:mm:ss month date year</i> <i>hh:mm:ss date month year</i> <ul style="list-style-type: none"> ● hh—hour ● mm—minute ● ss—second ● month—month ● date—day ● year—year The default start time is Jun 1, 1993, which is also the earliest start time available.
	infinite	Indicates that the encryption key is valid for ever.
	<i>end-time</i>	<i>End time of the encryption key. It must be later than the start time.</i>
	duration seconds	Duration of the encryption key after the start time. The value ranges from 1 to 2147483646.

Default infinite

Command mode Encryption key configuration mode

Usage guideline Use this command to specify the lifetime of an encryption key in its receiving direction.

Examples The following example configures the lifetime from 0:00 on September 9, 2000 to 0:00 on October 12, 2011.

```
Orion_B54Q(config)# key chain ripkeys
Orion_B54Q(config-keychain)# key 1
Orion_B54Q(config-keychain-key)#accept-lifetime 00:00:00 Sep 9 2000
00:00:00 Dec 12 2011
```

Related command	Command	Description
	-	-

Platform description

8.2 ip as-path access-list

Use this command to configure an autonomous system (AS) path filter using a regular expression. Use the **no** form of this command to remove the AS path filter using a regular expression.

```
ip as-path access-list path-list-num { permit | deny } regular-expression
no ip as-path access-list path-list-num [ { permit | deny } regular-expression ]
```

Parameter description	Parameter	Description
	<i>path-list-num</i>	Specifies the AS-path access-list number. The range is from 1 to 500.
	permit	Permits advertisement based on matching conditions.
	deny	Denies advertisement based on matching conditions.
	<i>regular-expression</i>	Regular expression that defines the AS-path filter. The expression length range is from 1 to 255 characters.

Default By default, no AS path filter using a regular expression is configured.

Command mode Global configuration mode

Usage guideline N/A

Examples The following example configures an AS path filter matching the path which contains AS number 123 only.

```
Orion_B54Q(config)# ip as-path access-list 105 deny ^123$
```

Related command	Command	Description
	-	-

Platform description

8.3 ip community-list

Use this command to define a community list and control access to it. Use the **no** form of this command to remove the setting.

ip community-list {[standard | expanded] *community-list-name* | *community-number*} {permit | deny} [*community-number*]

no ip community-list {standard | expanded} {*community-list-name* | *community-number*}

Parameter description

Parameter	Description
<i>community-list-name</i>	Name of the community list of no more than 32 characters
standard	Set a standard community list numbered in 1 to 99.
expanded	Set an expanded community list numbered over 100.
permit	Permit access to the community list.
deny	Deny access to the community list.
<i>community-number</i>	Community number in the form of AA:NN(AS number/2-byte numerical) in the range of 1 to 255 characters. It may also be one of the following value: Internet: Indicates the Internet community. All paths belong to this community. no-export: Indicates that this path will not be advertised to any EBGP peers. no-advertise: Indicates that this path will not be advertised to any BGP peers. local-as: Indicates that this path will not be advertised to out of the AS. When AS confederation is configured, this path will not be advertised to other ASs or sub-ASs.

Default configuration

None

Command mode

Global configuration mode.

Usage guidelines

This command is used to define the community list for BGP.

Examples

```
Orion_B54Q(config)# ip community-list standard 1 deny 100.20.200.20
Orion_B54Q(config)# ip community-list standard 1 permit internet
```

Related commands

Command	Description
match community	Match the community list.
set community-list delete	Remove the community value of the BGP path according to the community list.
show ip community-list	Show the community list information.

8.4 ip prefix-list

Use this command to create a prefix list or add an entry to the prefix list. Use the **no** form of this command to remove the prefix list or an entry.

ip prefix-list *prefix-list-name* [**seq** *seq-number*] { **deny** | **permit** } *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

no ip prefix-list *prefix-list-name* [**seq** *seq-number*] { **deny** | **permit** } *ip-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

Parameter description

Parameter	Description
<i>prefix-list-name</i>	Name of the prefix list
<i>seq-number</i>	Sequence number of an entry in the range of 1 to 2147483647. When you execute this command to add an entry without a sequence number, the system allocates a default sequence number for the entry. The default sequence number of the first entry is 5. Every subsequential entry without a sequence number uses the time of 5 larger than the previous sequence number as the default sequence number.
deny	Deny the route matching the prefix list.
permit	Permit the route matching the prefix list.
<i>ip-prefix</i>	Network address and mask. Network address can be any valid IP address and the mask length is in the range of 0 to 32.
<i>minimum-prefix-length</i>	(Optional) Minimum length of the prefix (the starting length) Note: “ge” indicates the operation of “larger than” and “equivalent to”.
<i>maximum-prefix-length</i>	(Optional) Maximum length of the prefix (the ending length) Note: “le” indicates the operation of “less than” and “equivalent to”.

Default configuration

None

Command mode

Global configuration mode.

Usage guidelines

The ip prefix-list command configures the prefix list, with the permit or deny keyword to determine the action in case of matching.

You can execute this command to define an exact match, or use “ge” or “le” to define a range match for a prefix for flexible configuration. “ge” indicates the range of minimum-prefix-length to 32; “le” indicates the range of the mask length of the IP prefix to maximum-

prefix-length; “ge” and “le” indicates the range of minimum-prefix-length to maximum-prefix-length, namely, mask length of IP prefix < minimum-prefix-length < maximum-prefix-length <=32.

The following example filters the RIP routes the OSPF redistributes by the destination IP address following the rule defined in the associated IP prefix list, for example, redistribute the routes whose destination IP address is in the range 201.1.1.0/24.

Examples

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ip prefix-list pre1 permit 201.1.1.0/24
Orion_B54Q(config)# router ospf
Orion_B54Q(config-router)# distribute-list prefix pre1 out rip
Orion_B54Q(config-router)# end
```

8.5 ip prefix-list description

Use this command to add the description of a prefix list. Use the **no** form of this command to delete the description.

ip prefix-list *prefix-list-name* **description** *description-text*

	Parameter	Description
Parameter description	<i>prefix-list-name</i>	Name of the prefix list
	<i>description-text</i>	Description of the prefix list

Default configuration
No description is added for a prefix list, by default.

Command mode
Global configuration mode

The example below adds the description for the prefix list:

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ip prefix-list pre description Deny routes
from Net-A
```

8.6 ip prefix-list sequence-number

Use this command to enable sort function for a prefix list. Use the **no** form of this command to disable the sort function.

ip prefix-list **sequence-number**

Parameter description	Disabled
------------------------------	----------

Default

configuration No sequence number is added for a prefix list, by default.

Command mode Global configuration mode

Examples

The example below adds a sequence number for the prefix list:

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ip prefix-list pre description deny routes
from Net-A
```

Related commands

Command	Description
ip prefix-list	Configure the prefix list.

Platform description N/A

8.7 ipv6 prefix-list

Use this command to create an IPv6 prefix list or add an entry in the prefix list. Use the **no** form of this command to delete an IPv6 prefix list or an entry in the prefix list.

ipv6 prefix-list *prefix-list-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

no ipv6 prefix-list *prefix-list-name* [**seq** *seq-number*] { **deny** | **permit** } *ipv6-prefix* [**ge** *minimum-prefix-length*][**le** *maximum-prefix-length*]

Parameter description

Parameter	Description
<i>prefix-list-name</i>	Name of the prefix list
<i>seq-number</i>	Sequence number of an entry in the prefix list. Its range is 1 to 4294967294. If the sequence number is not specified in this command, the system will allocate a default one for the entry. The default sequence number of the first entry is 5, and that of each subsequent one is the product of adding 5 to the sequence number of the proceeding entry.
permit	Permit the access to the matching result.
deny	Deny the access to the matching result.
<i>ipv6-prefix</i>	Network address and its mask. The network address can be any valid IP address. The mask can be 0 to 32 characters.
<i>minimum-prefix-length</i>	(Optional) Minimum length of the prefix (the starting length) Note: "ge" indicates the operation of "larger than" and "equivalent to".

<i>maximum-prefix-length</i>	(Optional) Maximum length of the prefix (the ending length) Note: "le" indicates the operation of "less than" and "equivalent to".
------------------------------	---

Default

configuration No prefix list is created.

Command mode Global configuration mode

Usage guideline

The ipv6 prefix-list command configures the prefix list, with the permit or deny keyword to determine the action in case of matching.

You can execute this command to define an exact match, or use "ge" or "le" to define a range match for a prefix for flexible configuration. "ge" indicates the range of minimum-prefix-length to 128; "le" indicates the range of the mask length of the IP prefix to maximum-prefix-length; "ge" and "le" indicates the range of minimum-prefix-length to maximum-prefix-length, namely, ipv6-prefix mask length < minimum-prefix-length < maximum-prefix-length <= 128

Examples

The following example filters the RIP routes the OSPF redistributes by the destination IP address following the rule defined in the associated IP prefix list, for example, redistribute the routes whose destination IP address is in the range 2222::/64.

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ipv6 prefix-list pre1 permit 2222::64
Orion_B54Q(config)# ipv6 router ospf
Orion_B54Q(config-router)# distribute-list prefix pre out rip
Orion_B54Q(config-router)# end
```

8.8 ipv6 prefix-list description

Use this command to add the description of an IPv6 prefix list. Use the **no** form of this command to delete the description.

ipv6 prefix-list *prefix-lis-name* **description** *description-text*
no ipv6 prefix-list *prefix-lis-name* **description** *description-text*

Parameter description

Parameter	Description
<i>prefix-lis-name</i>	Name of the ipv6 prefix list
<i>description-text</i>	Description of the ipv6 prefix list

Default

configuration No description is added for an IPv6 prefix list, by default.

Command mode Global configuration mode

The example below adds the description for the prefix list:

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ipv6 prefix-list pre description Deny routes
from Net-A
```

Examples

	Command	Description
Related commands	ipv6 prefix-list	Configure the IPv6 prefix list.

8.9 ipv6 prefix-list sequence-number

Use this command to enable the sorting function for an IPv6 prefix list. Use the **no** form of this command to remove the settings.

- ipv6 prefix-list sequence-number**
- no ipv6 prefix-list sequence-number**

Parameter description Disabled.

Default configuration No sequence number is added for a prefix list, by default.

Command mode Global configuration mode

The example below adds a sequence number for the prefix list:

```
Orion_B54Q# configure terminal
Orion_B54Q(config)# ipv6 prefix-list pre description Deny routes
from Net-A
```

Examples

	Command	Description
Related commands	ipv6 prefix-list	Configure the IPv6 prefix list.

8.10 key

Use this command to define an encryption key and enter the encryption key chain configuration mode. Use the **no** form of this command to delete it.

- key key-id**
- no key key-id**

Parameter	Parameter	Description
description	key-id	Key ID, ranging from 0 to 2147483647.

Default No encryption key is configured.

Command mode Encryption key chain configuration mode.

Usage guideline Use this command to define an encryption key.

Examples The following example configures encryption key chain ripkeys and key 1.

```
Orion_B54Q(config)# key chain ripkeys
Orion_B54Q(config-keychain)# key 1
```

Related command	Command	Description
	-	-

Platform description -

8.11 key chain

Use this command to define a key chain and enter the key chain configuration mode. Use the no form of this command to delete it.

key chain *key-chain-name*
no key chain *key-chain-name*

Parameter description	Parameter	Description
	<i>key-chain-name</i>	Key chain name.

Default No key chain is configured.

Command mode Global configuration mode.

Usage guideline  For a key chain to take effect, you need to configure at least one key.

Examples The following example configures key chain ripkeys and enters the key chain configuration mode.

```
Orion_B54Q(config)# key chain ripkeys
```

Related command	Command	Description
	-	-

Platform description -

8.12 key-string

Use this command to specify a key string. Use the no form of this command to delete it.

key-string [0|7] *text*

no key-string

Parameter description	Parameter	Description
	0	Use plaintext.
	7	Use encryption.
	<i>text</i>	Authentication string.

Default No key string is configured.

Command mode Encryption key configuration mode.

Usage guideline Use this command to specify a key string.

Examples The following example configures key chain ripkeys, key 1 and the key string abc:

```
Orion_B54Q(config)# key chain ripkeys
Orion_B54Q(config-keychain)# key 1
Orion_B54Q(config-keychain-key)#key-string abc
```

Related command	Command	Description
	-	-

Platform description -

8.13 match as-path

Use this command to redistribute the routes of AS_PATH attribute permitted by the access list in the route map configuration mode. Use the **no** form of this command to remove the setting.

match as-path *as-path-acl-list-num* [*as-path-acl-list-num.....*]

no match as-path *as-path-acl-list-num* [*as-path-acl-list-num.....*]

Parameter description	Parameter	Description
	<i>as-path-acl-list-num</i>	ACL number, in the range of 1 to 500.
	<i>access-list-name</i>	Name of the access list

Default configuration None.

Command

mode Route map configuration mode.

The match as-path can be followed by an access list number or name.

Usage

One or more match or set commands can be executed to configure one route map. If the match

guidelines

command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

Examples

```
!
route-map ROUTEMAP2IBGP
match as-path 20 30
```

Related commands

Command	Description
match community	Match the community.
match metric	Match the metric.
match origin	Match the source of routes.
set as-path prepend	Set the AS_PATH attribute of redistributed routes
set metric	Set the metric.
set metric-type	Set the metric type.

8.14 match community

Use this command to redistribute the routes matching the Community attribute permitted by the ACL in the route map configuration mode. Use the **no** form of this command to remove the setting.

match community { *community-list-number* | *community-list-name* } [**exact-match**] [{ *community-list-number* | *community-list-name* } [**exact-match**] ...]

no match community { *community-list-number* | *community-list-name* } [**exact-match**] [{ *community-list-number* | *community-list-name* } [**exact-match**] ...]

Parameter description

Parameter	Description
<i>community-list-number</i>	Number of the standard community list in the range 1 to 99. Number of the extended community list in the range of 100 to 199
<i>communitys-list-name</i>	Name of the community list in the range of less than 80 characters
exact-match	Match the community list exactly.

Default

configuration None.

Command

mode Route map configuration mode.

Usage

The match community can be followed by more than one community list number or name, but the

total of community lists and names should not be greater than 6.
 Each exact-match applies to only the previous list, not all the lists.

guidelines

One or more match or set commands can be executed to configure one route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

Examples

```
ip community-list 1 permit 100:2 100:30
route-map set lopref
match community 1 exact-match
set local-preference 20
```

Related commands

Command	Description
match as-path	Match the AS_PATH attribute.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set metric-type	Set the metric type.

8.15 match extcommunity

Use this command to define the match rule for the BGP extcommunity. Use the no form of this command to cancel the setting.

match extcommunity { *standard-list-number* | *standard-list-name* | *expanded-list-num* | *expanded-list-name* }

no match extcommunity { *standard-list-number* | *standard-list-name* | *expanded-list-num* | *expanded-list-name* }

Parameter description

Parameter	Description
<i>standard-list-number</i>	Standard extcommunity list number, ranging from 1 to 99. An extcommunity list may contains multiple excommunity values.
<i>standard-list-name</i>	Standard excommunity name. An extcommunity list may contains multiple excommunity values.
<i>expanded-list-num</i>	Expanded extcommunity list number, ranging from 100 to 199. An extcommunity list may contains multiple excommunity values.
<i>expanded-list-name</i>	Expanded excommunity name. An extcommunity list may contains multiple excommunity values.

Default

The rule is not defined in the associated route map.

Command mode

Route map configuration mode.

Usage guideline

There are the following scenarios for a route map with an extcommunity:

1. The route map associated with **import map** uses the RT attribute to filter imported VRF

routes.

2. The route maps associated with **neighbor route-map in** and **neighbor route-map out** are configured in the BGP VPNv4 address family mode and use the RT attribute to filter VPNv4 routes sent to or by BGP peers.

Examples

1. Define two extcommunity:

```
Orion_B54Q(config)# ip extcommunity-list 1 permit rt 100: 1
Orion_B54Q(config)# ip extcommunity-list 1 permit rt 100: 2
```

2. Define match rules in the route map:

```
Orion_B54Q(config)# route-map rt
Orion_B54Q(config-route-map)# match extcommunity 1
```

3. Use the route map.

```
Orion_B54Q(config)# router bgp 100
Orion_B54Q(config-router)# address-family vpnv4
Orion_B54Q(config-router-af)# neighbor 3.3.3.3 route-map rt in
```

Related command

Command	Description
ip extcommunity-list	Create an extcommunity list.
show ip extcommunity-list	Show an extcommunity list.

Platform description -

8.16 match interface

Use **match interface** command to redistribute the routes whose next hop is the specified interface. Use the **no** form of this command to remove the setting.

match interface *interface-type interface-number* [...*interface-type interface-number*]

no match interface [*interface-type interface-number* [...*interface-type interface-number*]]

Parameter description

Parameter	Description
<i>interface-type</i>	Interface type
<i>interface-number</i>	Interface number

Default configuration

None.

Command mode

Route map configuration mode.

Usage guidelines

This command can be followed by multiple interfaces. You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The route map can be configured very flexibly for route redistribution and policy-based routing. No matter how the route map is used, the configuration principle is the same, except that different command sets are used. Even if it is used on the route redistribution, different routing protocols can use different commands with the route map.

The following example redistributes the RIP route with the next hop of fastethernet 0/0 in the OSPF routing protocol.

Examples

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
match interface fastethernet 0/0
```

Related commands

Command	Description
match ip address	Match the address in the access list.
match ip next-hop	Match the next-hop IP address in the access list.
match ip route-source	Match the source IP address in the access list.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.17 match ip address

Use **match ip address** command to redistribute the routes matching the IP address permitted by the ACL or the prefix list. Use the **no** form of this command to remove the setting.

match ip address {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]} | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

no match ip address [*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

Parameter description

Parameter	Description
<i>access-list-number</i>	Number of the access list
<i>access-list-name</i>	Name of the access list

prefix-list <i>prefix-list-name</i>	Specify the prefix list to match.
--	-----------------------------------

Default

configuration None.

Command mode Route map configuration mode.

Usage guidelines

Multiple access list numbers or names may follow match ip address. You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains. One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The route map can be configured very flexibly for route redistribution and policy-based routing. No matter how the route map is used, the configuration principle is the same, except that different command sets are used. Even if it is used on the route redistribution, different routing protocols can use different commands with the route map.

The following example enables the OSPF routing protocol to redistribute RIP routes that match access list 10, with the route type being type-1 external type and the default metric being 40.

Examples

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

access-list 10 permit 200.168.23.0

route-map redrip permit 10
match ip address 10
set metric 40
set metric-type type-1!
```

Related commands

Command	Description
access-list	Set the access list.
match interface	Match the next-hop interface of the route.
match ip next-hop	Match the next-hop address in the access list.
match ip route-source	Match the route source address in the access list.
match metric	Match the metric.
match route-type	Match the route type.

Related commands

Command	Description
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.18 match ip next-hop

Use **match ip next-hop** command to redistribute the routes whose next-hop IP address matches the access list or the prefix list. Use the **no** form of this command to remove the setting.

match ip next-hop [*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

no match ip next-hop [*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]] | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

Parameter description

Parameter	Description
<i>access-list-number</i>	Number of the access list
<i>access-list-name</i>	Name of the access list
prefix-list <i>prefix-list-name</i>	Specify the prefix list to match.

Default configuration

None.

Command mode

Route map configuration mode.

Usage guidelines

Multiple access list numbers or names may follow match ip next-hop.

You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

Examples

In the example below, the OSPF routing protocol redistributes the RIP routes. As long as the next hop address of the RIP route matches the access list 10 or 20, the OSPF allows for redistribution.

```
router ospf
 redistribute rip subnets route-map redrip
 network 192.168.12.0 0.0.0.255 area 0
```

```
access-list 10 permit 192.168.100.1
access-list 20 permit 172.16.10.1

route-map redrip permit 10
match ip next-hop 10 20
```

Related commands

Command	Description
access-list	Set the access list.
match ip address	Match the IP address in the access list.
match interface	Match the next-hop interface of the route.
match ip route-source	Match the route source address in the access list.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.19 match ip route-source

Use **match ip route-source** command to redistribute the routes whose source IP address matches the access list. Use the **no** form of this command to remove the setting.

match ip route-source {*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]} | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

no match ip route-source [*access-list-number* [*access-list-number...* | *access-list-name...*] | *access-list-name* [*access-list-number...* | *access-list-name*]} | **prefix-list** *prefix-list-name* [*prefix-list-name...*]

Parameter	Description
<i>access-list-number</i>	Number of the access list
<i>access-list-name</i>	Name of the access list
prefix-list <i>prefix-list-name</i>	Specify the prefix list to match.

Default configuration None.

Command mode Route map configuration mode.

Usage guidelines Multiple access list numbers may follow match ip route-source. You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be

implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

In the example below, the OSPF routing protocol redistributes the RIP routes. As long as the source IP address of the RIP route matches the access list 5, the OSPF allows for redistribution.

Examples

```
router ospf
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

access-list 5 permit 192.168.100.1

route-map redrip permit 10
 match ip route-source
```

Related commands

Command	Description
access-list	Set the access list.
match ip address	Match the IP address in the access list.
match interface	Match the next-hop interface of the route.
match ip next-hop	Match the next-hop IP address in the access list.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.20 match ipv6 address

Use this command to redistribute the network routes permitted in the IPv6 access list or the IPv6 prefix list. Use the **no** form of this command to delete the setting.

match ipv6 address { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 address

Parameter description

Parameter	Description
<i>access-list-name</i>	Name of the access list.
prefix-list <i>prefix-list-name</i>	Specify the IPv6 prefix list to match.

Default

configuration None

Command mode Route map configuration mode

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.
 In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The route map can be configured very flexibly to be used for route redistribution and policy-based routing. No matter how the route map is used, the configuration principle is the same, except that different command sets are used. Even if it is used on the route redistribution, different routing protocols can use different commands with the route map. The following example enables the OSPF routing protocol to redistribute RIP routes that match access list v6acl, with the default metric being 30.

Examples

```
ipv6 router ospf
redistribute rip subnets route-map redrip
ipv6 access-list v6acl
10 permit ipv6 2620::64 any

route-map redrip permit 10
match ipv6 address v6acl
set metric 30
```

Related commands

Command	Description
ipv6 access-list	Set the IPV6 access list.
match interface	Match the next-hop interface of the route.
match ipv6 next-hop	Match the next-hop address in the IPV6 access list.
match ipvr route-source	Match the route source address in the IPV6 access list.
match metric	Match the route metric.
match route-type	Match the route type.
match tag	Match the route tag.
set metric	Set the metric for route redistribution.
set metric-type	Set the type for route redistribution.
set tag	Set the tag for route redistribution.

8.21 match ipv6 next-hop

Use this command to redistribute the network routes whose next-hop IP address matches the IPv6 access list or the IPv6 prefix list. Use the **no** form of this command to delete the setting.

match ipv6 next-hop { *access-list-name* } | **prefix-list** *prefix-list-name*}

no match ipv6 next hop

Parameter	Description
<i>access-list-name</i>	Name of the IPv6 access list.
prefix-list <i>prefix-list-name</i>	Specify the IPv6 prefix list to match.

Default configuration None

Command mode Route map configuration mode

You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains. One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The route map can be configured very flexibly to be used for route redistribution and policy-based routing. No matter how the route map is used, the configuration principle is the same, except that different command sets are used. Even if it is used on the route redistribution, different routing protocols can use different commands with the route map. The following example enables the OSPF routing protocol to redistribute RIP routes that only match access list v6acl, with the default metric being 40.

Examples

```

ipv6 router ospf
redistribute rip subnets route-map redrip

ipv6 access-list v6acl
10 permit ipv6 2620::64 any

route-map redrip permit 10
match ipv6 address v6acl
set metric 40

```

Related commands

Command	Description
ipv6 access-list	Set the IPV6 access list.
match interface	Match the next-hop interface of the route.
match ipv6 address	Match the IP address in the IPV6 access list.
match ipv6 route-source	Match the route source address in the IPV6 access list.
match metric	Match the route metric.
match route-type	Match the route type.
match tag	Match the route tag.
set metric	Set the metric for route redistribution.
set metric-type	Set the type for route redistribution.
set tag	Set the tag for route redistribution.

8.22 match ipv6 route-source

Use this command to redistribute the network routes whose next-hop IP address matches the IPV6 access list or the IPV6 prefix list. Use the **no** form of this command to delete the setting.

match ipv6 route-source { *access-list-name* | **prefix-list** *prefix-list-name* }

no match ipv6 route-source

Parameter description

Parameter	Description
<i>access-list-name</i>	Name of the IPV6 access list.
prefix-list <i>prefix-list-name</i>	Specify the IPV6 prefix list to match.

Default

configuration None

Command mode Route map configuration mode

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The route map can be configured very flexibly to be used for route redistribution and policy-based routing. No matter how the route map is used, the configuration principle is the same, except that different command sets are used. Even if it is used on the route redistribution, different routing protocols can use different commands with the route map. The following example enables the OSPF routing protocol to redistribute RIP routes that only match access list v6acl, with the default metric being 50.

Examples

```

ipv6 router ospf
redistribute rip subnets route-map redrip

ipv6 access-list v6acl
10 permit ipv6 5200::64 any

route-map redrip permit 10
match ipv6 address v6acl
set metric 50
    
```

Related commands

Command	Description
ipv6 access-list	Set the IPV6 access list.
match interface	Match the next-hop interface of the route.
match ipv6 address	Match the IP address in the IPV6 access list.
match ipv6 next-hop	Match the next hop in the IPV6 access list.
match metric	Match the route metric.
match route-type	Match the route type.
match tag	Match the route tag.
set metric	Set the metric for route redistribution.
set metric-type	Set the type for route redistribution.
set tag	Set the tag for route redistribution.

8.23 match metric

Use **match metric** command to redistribute the routes of the specified metric. Use the **no** form of this command to remove the setting.

match metric *metric*

no match metric *metric*

Parameter	Parameter	Description
description	<i>metric</i>	Route metric, in the range 0 to 4294967295

Default configuration None.

Command mode Route map configuration mode.

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guidelines

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains. In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

In the example below, the OSPF routing protocol redistributes the RIP routes of metric 10.

Examples

```
router ospf 1
redistribute rip subnets route-map redrip
network 192.168.12.0 0.0.0.255 area 0

route-map redrip permit 10
match metric 10
```

Related commands

Command	Description
access-list	Set the access list.
match ip address	Match the IP address.
match interface	Match the interface.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.24 match mpls-label

Use this command to specify the filtering conditions of a route map. When the BGP receives routes from its peers, only routes that meet the filtering conditions and have the required labels are accepted. Use the no form of this command to cancel this function.

- match mpls-label**
- no match mpls-label**

Parameter description

Parameter	Description
-	-

Default If the associated route map does not define the rule, MPLS labels will not be required for receiving routes.

Command mode Route map configuration mode.

Usage guideline This command is used only for the route map associated with **neighbor route-map in**. It applies only to the receive direction. If this command is not included in the rules specified by the route map, then the MPLS labels will not be required for receiving routes.
This command does not apply to VPNv4 routes. It applies only to IPv4 routes with labels.

Examples The following example creates a route map. Only routes that meet the following two conditions will be received.

1. The route prefix meets the acl1-defined rules.
2. The route includes MPLS labels.

```
Orion_B54Q(config)# route-map infiltrer permit 10
Orion_B54Q(config-route-map)# match ip address acl1
Orion_B54Q(config-route-map)# match mpls-label
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# router bgp 1
Orion_B54Q(config-router)# neighbor 1.1.1.1 route-map infiltrer in
```

Command	Description
neighbor send-label	Enable the function for the BGP and its peer to exchange routes with MPLS labels.
neighbor route-map out	Manage the policy for the BGP sending routes to its peers.
neighbor route-map in	Manage the policy for the BGP receiving routes from its peers.
set mpls-label	Assign an MPLS label to routes that meet the filtering conditions.

Platform -
description

8.25 match origin

Use this command to redistribute the routes whose source IP address is permitted by the ACL in the route map configuration mode. Use the **no** form of this command to remove the setting.

match origin {egp | igp | incomplete}

no match origin [egp | igp | incomplete]

Parameter	Description
egp	Redistribute the routes from the remote EGP.
igp	Redistribute the routes from the local IGP.
incomplete	Redistribute the routes from an incomplete type.

Default

configuratio

n None

Command

mode Route map configuration mode

Usage

guideline Use this command to set the origin of the routes to be redistributed. Only one origin can be set.

Examples

```
Orion_B54Q(config)# route-map MY_MAP 10 permit
Orion_B54Q(config-route-map)# match origin egp
Orion_B54Q(config-route-map)# set community 109
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map MAP20 20 permit
Orion_B54Q(config-route-map)# match origin incomplete
Orion_B54Q(config-route-map)# set community no-export
```

Related commands

Command	Description
match as-path	Match the AS_PATH attribute.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set origin	Set the source.

8.26 match route-type

Use this command to redistribute the network routes of the specified type. Use the **no** form of this command to delete the setting.

match route-type { static | connect | rip | local | internal | external [type-1 | type-2] | level-1 | level-2 }

no match route-type [static | connect | rip | local | internal | external [type-1 | type-2] | level-1 | level-2]

Parameter description

Parameter	Description
local	Indicates the local route type.
static	Indicates the static route type.
connect	Indicates the directly connected route type.
rip	Indicates the RIP route type.
internal	Indicates the OSPF internal route type.
external	Indicates the OSPF external route type.

type-1 type-2	Indicates the OSPF type-1 or type-2 route type.
level-1 level-2	Indicates the ISIS level-1 or level-2 route type.

Default configuration

n None

Command mode

Route map configuration mode

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

In the example below, the RIP routing protocol redistributes only the internal routes in the OSPF routing domain.

Examples

```
router rip
redistribute ospf route-map redrip
network 192.168.12.0

route-map redrip permit 10
match route-type internal
!
```

Related commands

Command	Description
access-list	Set the access list.
match ip address	Match the IP address.
match interface	Match the interface.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the access list.
set tag	Match the IP address.

8.27 match tag

Use this command to redistribute the network routes with the specified tag. Use the **no** form of this command to delete the setting.

match tag *tag* [...*tag*]

no match tag [*tag* [...*tag*]]

Parameter	Parameter	Description
description	<i>tag</i>	Route tag

Default configuration

n None

Command

mode Route map configuration mode

Multiple tags may follow the match tag command.

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

In the example below, the RIP routing protocol redistributes only the routes with tag 50 and 80 in the OSPF routing domain.

```
router rip
redistribute ospf 100 route-map redrip
network 192.168.12.0

route-map redrip permit 10
match tag 50 80
```

Examples

Related commands

Command	Description
access-list	Set the access list.
match ip address	Match the IP address.
match interface	Match the next-hop IP interface.
match ip route-source	Match the source IP address.
match metric	Match the metric.

match ip next-hop	Match the next-hop IP address.
match route-type	Match the route type.
set metric	Set the metric.
set metric-type	Set the metric type.
set tag	Set the tag.

8.28 memory-lack exit-policy

Use this command to configure a policy to preferentially exit a routing protocol when the memory reaches the lower limit. Use the **no** form of this command to restore the default policy, namely, exit the routing protocol which occupies the largest memory.

memory-lack exit-policy { bgp | ospf | pim-sm | rip }
no memory-lack exit-policy

Parameter description	Parameter	Description
	bgp	Preferentially exit BGP when the memory is insufficient.
	ospf	Preferentially exit OSPF when the memory is insufficient.
	pim-sm	Preferentially exit PIM-SM when the memory is insufficient.
	rip	Preferentially exit RIP when the memory is insufficient.

Default By default, the routing protocol which occupies the largest memory exits preferentially.

Command mode Global configuration mode

Usage guideline

When the memory reaches the lower limit, you can disable a routing protocol to release the memory to ensure the normal running of other protocols.

When the system runs out of memory, disable a routing protocol which has the minimal impact on the system to ensure the operation of main services.

Configuring the policy to preferentially exit the routing protocols which are disabled cannot help the system release memory.

This command ensures the operation of main services to some extent when the memory is insufficient. If the memory is further consumed, all routing protocols will exit and stop running.

Examples The following example configures a policy to preferentially exit the BGP protocol when the memory reaches the lower limit.

```
Orion_B54Q(config)# memory-lack exit-policy bgp
```

Related command	Command	Description
	-	-

Platform -

description

8.29 route-map

Use **route-map** to enter the route map configuration mode and define a route map. Use the **no** form of this command to remove the setting.

route-map *route-map-name* [**permit** | **deny**] [*sequence-number*]

no route-map *route-map-name* [{**permit** | **deny**}*sequence-number*]

Parameter description

Parameter	Description
<i>route-map-name</i>	Name of the route map. The redistribute command references the route map according to its name. Multiple routing policies can be defined in a route map, and each policy corresponds to one sequence number.
permit	(Optional) If the permit keyword is defined and the rule defined by match is met, The set command controls the redistributed routes. For policy-based routing, the set command controls the packet forwarding, and exits the route map operation. If the permit keyword is defined but the rule defined by match is not met, the system performs the routing policy of the second route map till the set command is executed finally.
deny	(Optional) If the deny keyword is defined and the rule defined by match is met, no operation will be performed. Neither route redistribution nor policy-based routing is supported in the route map. The system exits the route map operation. If the deny keyword is defined but the rule defined by match is not met, the system performs the routing policy of the second route map till the set command is executed finally.
<i>sequence-number</i>	Sequence number of the route map. The policy with a lower sequence number is preferred, so it's noted when setting the sequence number.

Default

configuration None.

Command mode Global configuration mode.

Usage guidelines

At present, the NOS software primarily uses the route map for route redistribution and policy-based routing.

1. Route redistribution control

You can redistribute the routes from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

One or more match or set commands can be executed to configure a route map. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

When configuring route maps, pay attention to the following when using the sequence number of a route map:

When you create the first route map policy, if *sequence-number* is not specified, it is 10 by default;

If only one route map policy exists and *sequence-number* is not specified, no new route map policy will be created, and the existing route map policy will be accessed for configuration;

If more than one route map policy is available, the sequence number of each policy shall be specified; otherwise an error message will be displayed.

2. policy-based routing

Policy-based routing refers to a routing mechanism based on user defined policies.

Compared with traditional destination IP address-based routing, policy-based routing offers a flexibility for routing based on source IP address, length and port of IP packets. Policy-based routing can apply to the IP packets received on an interface or the IP packets sent from the local device.

Policy-based routing utilizes route map to define routing and forwarding policy. The match command defines packet filtering rule and the set command defines the action for the packets matching the filtering rules. The match command used includes match ip address and match length; the set command includes set ip tos, set ip precedence, set ip dscp, set ip [default] nexthop, set ip next-hop verify-availability, set [default] interface.

The following example enables the OSPF routing protocol to redistribute the RIP routes with the hop count of 4. In the OSPF route domain, the route type is the external route type-1, the default metric is 40 and the tag is 40.

Examples

```
!  
router ospf  
  redistribute rip subnets route-map redrip  
  network 192.168.12.0 0.0.0.255 area 0  
!  
!  
route-map redrip permit 10  
  match metric 4  
  set metric 40  
  set metric-type type-1  
  set tag 40
```

Related commands	Command	Description
	redistribute	

8.30 send-lifetime

Use this command in the encryption key configuration mode to specify the lifetime of an encryption key in its send direction. Use the no form of this command to restore the default value.

send-lifetime *start-time* {infinite | *end-time* | **duration** *seconds*}

no send-lifetime

Parameter	Parameter	Description
description	<i>start-time</i>	Start time of the lifetime. The syntax is as follows: <i>hh:mm:ss month date year</i> <i>hh:mm:ss date month year</i> <ul style="list-style-type: none"> ● hh—hour ● mm—minute ● ss—second ● month—month ● date—day ● year—year The default start time is Jun 1, 1993, which is also the earliest start time available.
	infinite	Indicates that the encryption key is valid for ever.
	<i>end-time</i>	<i>End time of the encryption key. It must be later than the start time.</i>
	duration <i>seconds</i>	Duration of the encryption key after the start time. The value ranges from 1 to 2147483646.

Default infinite

Command mode Encryption key configuration mode

Usage guideline Use this command to specify the lifetime of an encryption key in its send direction.

Examples The following example configures the lifetime from 0:00 on September 9, 2000 to 0:00 on October 12, 2011

```
Orion_B54Q(config)# key chain ripkeys
Orion_B54Q(config-keychain)# key 1
Orion_B54Q(config-keychain-key)# send-lifetime 00:00:00 Sep 9 2000 00:00:00
Dec 12 2011
```

Related command	Command	Description
	-	-

Platform -
description

8.31 set aggregator as

Use this command to specify the AS_PATH attribute for the aggregator of the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set aggregator as *as-number ip_addr*
no set aggregator as [*as-number ip_addr*]

	Parameter	Description
Parameter description	<i>as-number</i>	AS number of the aggregator
	<i>ip_address</i>	IP address of the aggregator

Default configuration
n None

Command mode Route map configuration mode

Usage guideline Use this command to set the AS_PATH attribute for the matched routes in the BGP routing domain. Only one group of parameters (as-number, ip-addr) is allowed to set at a time.

```

Examples
Orion_B54Q(config)# route-map set-as-path
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set aggregator as 3 2.2.2.2
    
```

	Command	Description
Related commands	match as-path	Match the AS_PATH.
	match community	Match the community.
	match metric	Match the route metric.
	match origin	Match the route source.
	set community	Set the COMMUNITY attribute.
	set metric	Set the metric.
	set metric-type	Set the type.

8.32 set as-path prepend

Use this command to specify the AS_PATH attribute for the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set as-path prepend *as-number*

no set as-path prepend

Parameter	Parameter	Description
description	<i>as-number</i>	AS number of the AS_PATH attribute to be configured. The AS number ranges from 1 to 4294967295, and 1 to 65535.65535 in dot mode.

Default configuration
None

Command mode
Route map configuration mode

Usage guideline
Use this command to configure the AS_PATH attribute for the matched routes. Up to 15 ass can be added into the as-path for one time.

Examples

```
Orion_B54Q(config)# route-map set-as-path
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set as-path prepend 100 101 102
```

Command	Description
match as-path	Match the AS_PATH.
match community	Match the community.
match metric	Match the route metric.
match origin	Match the route source.
set community	Set the COMMUNITY attribute.
set metric	Set the metric.
set metric-type	Set the type.

8.33 set comm-list delete

Use this command to delete the COMMUNITY_LIST attribute for the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set comm-list *community-list-number* | *community-list-name* **delete**

no set comm-list *community-list-number* | *community-list-name* **delete**

Parameter	Description
<i>community-list-number</i>	Number of the community list. Standard community list number : 1-99. extended community list number : 100-199.
<i>community-list-name</i>	Name of the community list, which should be no more than 80 characters.

Default configuration None

Command mode Route map configuration mode

Usage guideline Use this command to set the community attribute value for the matched routes that will be deleted.

Examples

```
Orion_B54Q(config)# router bgp 100
Orion_B54Q(config-router)# neighbor 172.16.233.33 remote-as 120
Orion_B54Q(config-router)# neighbor 172.16.233.33 route-map
ROUTEMAPIN in
Orion_B54Q(config-router)# neighbor 172.16.233.33 route-map
ROUTEMAPOUT out
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# ip community-list 500 permit 100:10
Orion_B54Q(config)# ip community-list 500 permit 100:20
Orion_B54Q(config)# ip community-list 120 deny 100:50
Orion_B54Q(config)# ip community-list 120 permit 100:.*
Orion_B54Q(config)# route-map ROUTEMAPIN permit 10
Orion_B54Q(config-route-map)# set comm-list 500 delete
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map ROUTEMAPOUT permit 10
Orion_B54Q(config-route-map)# set comm-list 120 delete
```

Related commands

Command	Description
match as-path	Match the AS_PATH attribute value.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set local-preference	Set the local priority of the route to be redistributed.
set metric-type	Set the metric type.

8.34 set community

Use this command to specify the community for the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set community {*community-number*[*community-number...*] [**additive** | **none**]}

no set community

Parameter	Description
<i>community-number</i>	Community number in the form of AA:NN or a large numeral. In addition, it can be well-known community attributes like internet, local-AS, no-export and no-advertise.
additive	Increase on the original COMMUNITY attribute.
none	Set the community attribute as blank.

Parameter description

Default configuration

None

Command mode

Route map configuration mode

Usage guideline

Use this command to set the community attribute for the matched route.

Examples

```
Orion_B54Q(config)# route-map SET_COMMUNITY 10 permit
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set community 109:10
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map SET_COMMUNITY 20 permit
Orion_B54Q(config-route-map)# match as-path 2
Orion_B54Q(config-route-map)# set community no-export
```

Related commands

Command	Description
match as-path	Match the AS_PATH.
match community	Match the community.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set origin	Set the source.
set metric-type	Set the metric type.

8.35 set dampening

Use this command to specify the dampening parameters for the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set dampening *half-life reuse suppress max-suppress-time*

no set dampening

Parameter description

Parameter	Description
<i>half-life</i>	Half dampening life for the reachable or unreachable route in the range of 1 to 45 minutes, 15 minutes by default
<i>reuse</i>	When the route penalty is lower than this value, the route suppression is released. It is in the range 1 to 20000, 750 by default
<i>suppress</i>	When the route penalty is higher than this value, the route is suppressed. It is in the range 1 to 20000, 2000 by default
<i>max-suppress-time</i>	Maximum duration a route can be suppressed in the range 1 to 20000 minutes, 4* half-life by default.

Default configuration

None

Command mode

Route map configuration mode

Usage guideline

Use this command to set the dampening parameter for the matched routes.

Examples

```
Orion_B54Q(config)# route-map tag
Orion_B54Q(config-route-map)# match as-path 10
Orion_B54Q(config-route-map)# set dampening 30 1500 10000 120
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# router bgp 100
Orion_B54Q(config-router)# neighbor 172.16.233.52 route-map tag in
```

Related commands

Command	Description
match as-path	Match the AS_PATH value.
match community	Match the community.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set local-preference	Set the local priority of the route to be redistributed.

8.36 set extcommunity

Use this command to specify the extended COMMUNITY attribute for the routes that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set extcommunity {rt *extend-community-value* | **soo** *extend-community-value*}

no set extcommunity {rt | **soo** }

	Parameter	Description
Parameter description	rt	Specify the extended community value in the form of RT.
	soo	Specify the extended community value in the form of SOO.
	<i>extend-community-value</i>	Extended community value.

Default configuration None

Command mode Route map configuration mode

Usage guideline Use this command to set the extended community attribute for the matched route.

Examples

```
Orion_B54Q(config)# access-list 2 permit 192.168.78.0 255.255.255.0
Orion_B54Q(config)# route-map MAP_NAME permit 10
Orion_B54Q(config-route-map)# match ip-address 2
Orion_B54Q(config-route-map)# set extcommunity rt 100:2
```

Related commands

Command	Description
match as-path	Match the AS_PATH value
match community	Match the community.
match metric	Match the metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set metric-type	Set the metric type.

8.37 set extcomm-list delete

Use this command to delete all extcommunity values in the extcommunity list that meet the match rules. Use the **no** form of this command to delete the configuration.

set extcomm-list { *extcommunity-list-number* | *extcommunity-list-name* } **delete**

no set extcomm-list { *extcommunity-list-number* | *extcommunity-list-name* } **delete**

Parameter description	Parameter	Description
	<i>extcommunity-list-number</i>	<i>extcommunity-list-number</i> Standard list: ranges from 1 to 99. Expanded list: ranges from 100 to 199.
	<i>extcommunity-list-name</i>	<i>extcommunity-list-name</i> It consists of a maximum of 80 characters.

Default -

Command mode Route map configuration mode.

Usage This command is used to delete the **extcommunity-list**.

guideline This command applies only to policy route configuration.

```

Orion_B54Q(config)# router bgp 65530
Orion_B54Q(config-router)# neighbor 172.16.233.33 remote-as 65531
Orion_B54Q(config-router)# address-family vpnv4 unicast
Orion_B54Q(config-router-af)# neighbor 172.16.233.33 activate
Orion_B54Q(config-router-af)# neighbor 172.16.233.33 route-map ROUTEMAPIN
in
Orion_B54Q(config-router-af)# neighbor 172.16.233.33 route-map ROUTEMAPOUT
out
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# ip extcommunity-list 10 permit rt 100:10
Orion_B54Q(config)# ip extcommunity-list 10 permit rt 100:20
Orion_B54Q(config)# ip extcommunity-list 120 deny 100:50
Orion_B54Q(config)# ip extcommunity-list 120 permit 100:.*
Orion_B54Q(config)# route-map ROUTEMAPIN permit 10
Orion_B54Q(config-route-map)# set extcomm-list 10 delete
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map ROUTEMAPOUT permit 10
Orion_B54Q(config-route-map)# set extcomm-list 120 delete
    
```

Related command	Command	Description
	ip extcommunity-list	Configure an extcommunity-list .
	match as-path	Match the AS_PATH value
	match metric	Match the metric.
	match origin	Match the source.
	set as-path prepend	Set the AS_PATH attribute.
	set extcomm-list delete	Set delete extcommunity-list .
	set local-preference	Set local preference for a reroute.

Platform description -

8.38 set fast-reroute

Use this command to specify a backup outgoing fast reroute and a backup next-hop for routes that meet the match conditions. Use the no form of this command to delete the configuration.


set fast-reroute backup-interface *interface-type interface-number* [**backup-nexthop** *ip-address*]
no set fast-reroute

Parameter	Parameter	Description
description	<i>interface-type interface-number</i>	Backup outgoing interface.
	<i>ip-address</i>	Backup next-hop.

Default -

Command mode Route map configuration mode.

Usage guideline Use this command to configure IP FRR backup outgoing interface and backup next-hop. The current software version supports only one backup route. This command supports only one set of the two parameters.
 This command is used for fast reroute configuration.

 IP FRR backup routes must not be direct-connection or local host routes.

Examples

```
Orion_B54Q(config)# access-list 2 permit 192.168.78.0 255.255.255.0
Orion_B54Q(config)# route-map frr permit 10
Orion_B54Q(config-route-map)# match ip-address 2
Orion_B54Q(config-route-map)# set fast-reroute backup-interface
GigabitEthernet 0/1 backup-nexthop 192.168.1.2
```

Related command	Command	Description
	match ip-address	Match IP address list.

Platform description N/A

8.39 set ip default next-hop

Use this command to specify the default next-hop IP address for the packets that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting.

set ip default next-hop *ip-address* [*weight*] [...*ip-address*[*weight*]]
no set ip default next-hop [*ip-address* [*weight*] [...*ip-address*[*weight*]]]

Parameter	Parameter	Description
-----------	-----------	-------------

description	<i>ip-address</i>	IP address of the next hop.
	<i>weight</i>	Weight of the next hop.

Default configuration None

Command mode Route map configuration mode

This command supports two operation modes: WCMP load balancing mode and non-WCMP load balancing mode. In the former mode, the system implements WCMP load balancing according to the weight inputted.

Up to 32 IP addresses may follow the set ip default next-hop command.

If a weight follows ip address, up to 4 next hop IP addresses can be configured.

Note: If a weight follows any next-hop, the operation mode of this command will be automatically switched to the WCMP load balancing mode. In this mode, the weight of those next hop IP addresses whose weight is not configured is 1 by default.

Differences between set ip next-hop and set ip default next-hop: After the set ip next-hop command is configured, the policy-based routing takes precedence over the routing table; while after the set ip default next-hop command is configured, the routing table takes precedence over the policy-based routing.

Usage guideline

Use this command to customize a default route for a specified user. If the software fails to find the forwarding route, the packet will be forwarded to the nexthop set with this command.

To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded through the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

A route-map policy may contain multiple set operations.

Examples

The following example forwards the packets from two different nodes through different routes.

For the messages received on the synchronous interface 1 from 1.1.1.1, if the software cannot find the forwarding route, they are forwarded to device 6.6.6.6. For the messages received from 2.2.2.2, if the software cannot find the forwarding route, they are forwarded to device 7.7.7.7. The other messages will be discarded if the software cannot find the forwarding route.

```
Orion_B54Q(config)#access-list 1 permit 1.1.1.1 0.0.0.0
Orion_B54Q(config)#access-list 2 permit 2.2.2.2 0.0.0.0
Orion_B54Q(config)#interface async 1
Orion_B54Q(config-if)#ip policy route-map equal-access
```

```

Orion_B54Q(config)#route-map equal-access permit 10
Orion_B54Q(config- route-map)#match ip address 1
Orion_B54Q(config-route-map)#set ip default next-hop 6.6.6.6
Orion_B54Q(config)#route-map equal-access permit 20
Orion_B54Q(config-route-map)#match ip address 2
Orion_B54Q(config-route-map)#set ip default next-hop 7.7.7.7
Orion_B54Q(config)#route-map equal-access permit 30
Orion_B54Q(config- route-map)#set default interface null 0
    
```

Related commands

Command	Description
route-map	Define a route map.
match ip address	Match the IP address.
set default interface	Set the default outgoing interface.
set interface	Set the outgoing interface.
set ip next-hop	Set the next hop of the packets.
set ip precedence	Set the priority of the packets.

Platform

description N/A

8.40 set ip dscp

Use this command to specify the DSCP value for the packets that match the rule in the route map configuration mode.

Use the **no** form of this command to remove the setting.

set ip dscp *dscp-value*

no set ip dscp

Parameter description

Parameter	Description
<i>dscp-value</i>	DSCP value

Default configuration

N/A

Command mode

Route map configuration mode

Usage guideline

N/A

Examples

N/A

Related commands

Command	Description
route-map	Define a route map.
match ip address	Match the IP address.

set default interface	Set the default outgoing interface.
set interface	Set the outgoing interface.
set ip next-hop	Set the next hop of the packets.
set ip precedence	Set the priority of the packets.

8.41 set ip next-hop

Use this command to specify the next-hop IP address for the packets that meet the matching rule. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set ip next-hop *ip-address* [weight] [...*ip-address* [weight]]


no set ip next-hop [*ip-address* [weight] [...*ip-address*[weight]]]

Parameter	Description
<i>ip-address</i>	IP address of the next hop.
<i>weight</i>	Weight of the next hop.

Default configuration None

Command mode Route map configuration mode

Usage guideline This command supports two operation modes: WCMP load balancing mode and non-WCMP load balancing mode. In the former mode, the system implements WCMP load balancing according to the weight entered by the user. Multiple IP addresses may follow set ip next-hop and the number of addresses should be less than 32.

 If weight follows any next-hop, the operation mode of this command will be automatically switched to the WCMP load balancing mode. In the WCMP load balancing mode, for the nexthop address without configuring the corresponding weight, the weight is 1 by default.

If weight follows ip address, up to 4 next hop addresses can be configured.

This command can be used to set different routes for the traffic that meets different match rule. If multiple IP addresses are configured, they can be used in turn.

Policy-based routing is a packet forwarding mechanism more flexible than the routing based on the target network. After the policy-based routing is used, the device will decide how to process the packets that need be routed according to the route map, which decides the next-hop device of the packets.

To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface,

the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy. A route-map policy may contain multiple set operations.

The following example enables policy-based routing on serial 1/0. When the interface receives the packets from 10.0.0.0/8, they will be sent to 192.168.100.1; when the interface receives the packets from 172.16.0.0/16, they will be sent to 172.16.100.1; all other packets will be discarded.

Examples

```
Orion_B54Q(config)#interface serial 1/0
Orion_B54Q(config-if)#ip policy route-map load-balance
Orion_B54Q(config)#access-list 10 permit 10.0.0.0 0.255.255.255
Orion_B54Q(config)#access-list 20 permit 172.16.0.0 0.0.255.255
Orion_B54Q(config)#route-map load-balance permit 10
Orion_B54Q(config-route-map)#match ip address 10
Orion_B54Q(config-route-map)#set ip next-hop 192.168.100.1
Orion_B54Q(config)#route-map load-balance permit 20
Orion_B54Q(config-route-map)#match ip address 20
Orion_B54Q(config-route-map)#set ip next-hop 172.16.100.1
Orion_B54Q(config)#route-map load-balance permit 30
Orion_B54Q(config-route-map)#set interface Null 0
```

Related commands

Command	Description
route-map	Define the route map.
match ip address	Match the IP address.
set default interface	Set the default outgoing interface.
set interface	Set the outgoing interface.
set ip default next-hop	Set the default next hop.
set ip precedence	Set the priority of the packets.

8.42 set ip next-hop verify-availability

Use this command to verify the availability of the next hop IP address for the packets that meet the matching rule. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set ip next-hop verify-availability *ip-address track track-object-num*
no set ip next-hop verify-availability

Parameter description

Parameter	Description
<i>ip-address</i>	IP address of the next hop
<i>track-object-num</i>	Number of the object to be tracked

Default None

configuration

Command mode Route map configuration mode

Usage guideline None

The following example verifies the availability of the next hop IP address being 192.168.1.2 and the number of the object to be tracked to 1.

Examples

```
Orion_B54Q(config)#route-map rmap permit 10
Orion_B54Q(config-route-map)#set ip next-hop verify-availability
192.168.1.2 track 1
```

Related commands

Command	Description
route-map	Define the route map.
match ip address	Match the IP address.
set default interface	Set the default outgoing interface.
set interface	Set the outgoing interface.
set ip default next-hop	Set the default next hop.
set ip precedence	Set the priority of the packets.

8.43 set ip policy load-balance

Use this command to configure PBR load balancing. Use the **no** form of this command to remove the setting.

set ip policy load-balance { dst-ip | src-ip | src-l4port-src-ip | dst-l4port-dst-ip | dst-l4port-src-l4port-dst-ip-src-ip | src-l4port-dst-l4port-src-ip-dst-ip }
no set ip policy load-balance

Parameter description

Parameter	Description
dst-ip	Load balancing is based on destination-IP address.
src-ip	Load balancing is based on source-IP address.
src-l4port-src-ip	Load balancing is based on L4 source-port and source-IP address.
dst-l4port-dst-ip	Load balancing is based on L4 destination-port and source-IP address.
dst-l4port-src-l4port-dst-ip-src-ip	Load balancing is based on L4 destination-port, L4 source-port, destination-IP address and source-IP address.
src-l4port-dst-l4port-src-ip-dst-ip	Load balancing is based on L4 source-port, L4 destination-port, source-IP address and destination-IP address.

Default

configuration PBR load balancing is not configured by default.

Command mode Route map configuration mode

This command is used only for PBR configuration.

Usage guideline There are 6 methods for configuring PBR load balancing, and the methods can take effect only in PBR load balancing mode.

The following example configures L4 source-port and source-IP address based PBR load balancing for the incoming traffic of interface GigabitEthernet 1/0.

Examples

```
Orion_B54Q(config)# interface GigabitEthernet 1/0
Orion_B54Q(config-if)# ip policy route-map pbr1
Orion_B54Q(config-if)# exit
Orion_B54Q(config)# ip policy load-balance
Orion_B54Q(config)# route-map pbr1 permit 10
Orion_B54Q(config)# set ip policy load-balance src-l4port-src-ip
```

Related commands

Command	Description
N/A	N/A

8.44 set ip precedence

Use this command to set the precedence of the IP head of the packet matching the rule in the route map configuration mode. Use the **no** form of this command to remove the configured precedence setting.

set ip precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }
no set ip precedence

Default

configuration N/A

Command mode Route map configuration mode

With different precedence values for the IP packet head configured, the IP packets matching the PBR routing are sent according to the different precedence values.

Usage guideline Multiple set ip precedence commands can be executed in the route map configuration rule, but only the last one takes effect, and the precedence will be specified for the head of the IP packet matched the PBR.

Examples The following example sets the precedence of the packet with the source IP address 192.168.217.68 received at the interface FastEthernet 0/0 as 4:

```
Orion_B54Q(config)#access-list 1 permit 192.168.217.68 0.0.0.0
```

```
Orion_B54Q(config)#route-map name
Orion_B54Q(config-route-map)#match ip address 1
Orion_B54Q(config-route-map)#set ip precedence 4
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ip policy route-map name
```

Related commands

Command	Description
match interface	Match the next-hop interface.
match ip address	Match the IP address in the ACL.
match ip next-hop	Match the next-hop IP address in the ACL.
match ip route-source	Match the route source IP address in the ACL.
match metric	Match the route metric value.
match route-type	Match the route type.
match tag	Match the route tag value.
set metric-type	Set the type of redistributed route.
set tag	Set the tag value of redistributed route.
set ip tos	Set the tos for the IP packet head.

8.45 set ip tos

Use this command to set the tos of the IP head of the packet matching the rule in the route map configuration mode. Use the **no** form of this command to remove the configured tos setting.

```
set ip tos {<0-15> | max-reliability | max-throughput | min-delay | min-monetary-cost | normal }
no set ip tos
```

Default

configuration N/A

Command mode Route map configuration mode

Usage guideline

With different TOS values for the IP packet head configured, the IP packets matching the PBR routing are transmitted with different service qualities.
The TOS value will be specified for the head of the IP packet matched the PBR.

Examples

The following example sets the TOS value of the packet with the source IP address 192.168.217.68 received at the interface FastEthernet 0/0 as 4:

```
Orion_B54Q(config)#access-list 1 permit 192.168.217.68 0.0.0.0
Orion_B54Q(config)#route-map name
Orion_B54Q(config-route-map)#match ip address 1
Orion_B54Q(config-route-map)#set ip tos 4
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ip policy route-map name
```

Related commands	Command	Description
	match interface	Match the next-hop interface.
	match ip address	Match the IP address in the ACL.
	match ip next-hop	Match the next-hop IP address in the ACL.
	match ip route-source	Match the route source IP address in the ACL.
	match metric	Match the route metric value.
	match route-type	Match the route type.
	match tag	Match the route tag value.
	set metric-type	Set the type of redistributed route.
	set tag	Set the tag value of redistributed route.
	set ip precedence	Set the precedence for the IP packet head.

8.46 set ipv6 default next-hop

Use this command to specify the default next-hop IPv6 address for the IPv6 packets that match the rule in the route map configuration mode. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set ipv6 default next-hop *global-ipv6-address* [*weight*] [...*ipv6-address*[*weight*]]

no set ipv6 default next-hop *global-ipv6-address* [*weight*] [...*ipv6-address*[*weight*]]

Parameter description	Parameter	Description
	<i>global-ipv6-address</i>	IPv6 address of the next hop. The next hop router must be the neighbor router.
	<i>weight</i>	Weight in the load balancing mode, in the range of 1 to 8.

Default configuration None

Command mode Route map configuration mode

Usage guideline With the policy-based routing applied to the interface, for the IPv6 packets matching the corresponding rules, if the usual route (that is the non default route) with the destination of this packet is not in the routing table, this packet will be forwarded to the next hop specified by the set ipv6 default next-hop command. Otherwise it is forwarded through the usual route. Noted that the match rule should be the IPv6 corresponded.

Packets select the egress from the policy-based routing and routing table in following priority.

- set ipv6 next-hop;
- usual route (the non default route)
- set ipv6 default next-hop
- default route.

- ⚠ For the switches, this function does not take effect if the mask length is beyond 64.
- ⚠ If this command and the `set ipv6 next-hop verify-availability` are both configured, the next hop set by the `set ipv6 next-hop verify-availability` command will take effect preferentially.

The following example sets the default next hop of the packet with destination address `2001:0db8:2001:1760::/64` received at the interface `fastEthernet 0/0` as `2002:0db8:2003:1::95`

Examples

```
Orion_B54Q(config)# ipv6 access-list acl_for_pbr
Orion_B54Q(config-ipv6-acl)#permit ipv6 any 2001:0db8:2001:1760::/64
Orion_B54Q(config)#route-map rm_if_0_0
Orion_B54Q(config-route-map)#match ipv6 address acl_for_pbr
Orion_B54Q(config-route-map)# set ipv6 default next-hop
2002:0db8:2003:1::95
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ipv6 policy route-map rm_if_0_0
```

Related commands

Command	Description
<code>match ipv6 address</code>	Set the matching rule of policy-based routing.
<code>ipv6 policy route-map</code>	Use the policy-based routing on the interface.
<code>set ipv6 next-hop</code>	Set the next hop of the policy-based routing.

Platform

description N/A

8.47 set ipv6 next-hop

Use this command to specify the next-hop IPv6 address for the packets that meet the matching rule. Use the **no** form of this command to remove the setting. This command is only used to configure policy-based routing.

set ipv6 next-hop [**vrf** *vrf-name* | **global**] *global-ipv6-address* [**weight**] [...*global-ipv6-address* [**weight**]]

no set ip next-hop [**vrf** *vrf-name* | **global**] *global-ipv6-address* [**weight**] [...*global-ipv6-address* [**weight**]]

Parameter description

Parameter	Description
<i>global-ipv6-address</i>	IPv6 address of the next hop. The next hop router should be the neighbor router.
<i>vrf vrf-name</i>	The nexthop belongs to the specified VRF which must be the configured IPv6 address family multi-protocol VRF.
<i>global</i>	The nexthop belongs to the global.
<i>weight</i>	Weight of the next hop in the load balancing mode, in the range of 1 to 8.

Default

configuration None

Command mode Route map configuration mode


This command supports two operation modes: WCMP load balancing mode and non-WCMP load balancing mode. In the former mode, the system implements WCMP load balancing according to the weight entered by the user.

Multiple IP addresses may follow set ip next-hop and the number of addresses should be less than 32.

If weight follows ip address, up to 4 next hop addresses can be configured.

If the parameter vrf *vrf-name* is specified, packets forwarding will be across the VRF. The packets will be forwarded from VRF to public network with the parameter global specified. If no [vrf *vrf-name* | global] is specified, forwarding the IPv6 packets will inherit the VRF, that is the nexthop belongs to the VRF that receives this IPv6 packets.

Usage guideline

 If weight follows any next-hop, the operation mode of this command will be automatically switched to the WCMP load balancing mode. In the WCMP load balancing mode, for the nexthop address without configuring the corresponding weight, the weight is 1 by default.

When the packets select the egress from the policy-based routing and routing table, the priorities are as bellows.

- set ipv6 next-hop;
- usual route (the non default route)
- set ipv6 default next-hop
- Default route.

The following examle sets the next hop of the packet with destination address *2001:0db8:2001:1760::/64* received at the interface fastEthernet 0/0 as *2002:0db8:2003:1::95*

Examples

```
Orion_B54Q(config)# ipv6 access-list acl_for_pbr
Orion_B54Q(config-ipv6-acl)#permit ipv6 any 2001:0db8:2001:1760::/64
Orion_B54Q(config)#route-map rm_if_0_0
Orion_B54Q(config-route-map)#match ipv6 address acl_for_pbr
Orion_B54Q(config-route-map)# set ipv6 next-hop
2002:0db8:2003:1::95
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ipv6 policy route-map rm_if_0_0
```

Related commands

Command	Description
match ipv6 address	Set the matching rule of policy-based routing.
ipv6 policy route-map	Use the policy-based routing on the interface.
set ipv6 next-hop	Set the next hop of the policy-based routing.

Platform
description N/A

8.48 set ipv6 precedence

Use this command to set the precedence of the IPv6 head of the packet matching the rule in the route map configuration mode. Use the **no** form of this command to remove the configured precedence setting.

set ipv6 precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }
no set ipv6 precedence {<0-7> | *critical* | *flash* | *flash-override* | *immediate* | *internet* | *network* | *priority* | *routine* }

	Parameter	Description
Parameter description	<i>critical, flash, flash-override, immediate, internet, network, priority, routine</i>	The precedence type of the IPv6 head.
	0~7	The configurable precedence range.

Default configuration N/A

Command mode Route map configuration mode

The following table shows the corresponding relationship between the value and type.

	Value	Type
Usage guideline	0	routing
	1	priority
	2	network
	3	internet
	4	immediate
	5	flash-override
	6	flash
	7	critical

Examples The following example sets the precedence of IPv6 packet head as 3:

Configure the associated ACL6

```
Orion_B54Q(config)#ipv6 access-list aaa
Orion_B54Q(config-ipv6-acl)#permit ipv6 2003:1000::10/80
2001:100::/64
```

Configure route-map.

```
Orion_B54Q(config)#route-map pbr-aaa permit 10
Orion_B54Q(config-route-map)#set ipv6 next-hop 2001:1234::2
```

Modify the precedence.

```
Orion_B54Q(config-route-map)# set ipv6 precedence 3
```

Or

```
Orion_B54Q(config-route-map)# set ipv6 precedence immediate
```

Related commands

Command	Description
match ipv6 address	Configure the ACL used for matching the packet in IPv6 PBR.
route-map	Use the route map of the policy-based routing.
set default interface	Set the default next-hop egress.
set interface	Set the next hop egress.
set ipv6 default next-hop	Set the default next-hop address for forwarding packets.
set ipv6 next-hop	Set the next-hop address for forwarding packet.
show ipv6 policy	Show the policy-based routing
show route-map	Show the route map configuration.

Platform description

N/A

8.49 set level

Use this command to set the level of the area where the routes matching the rule are redistributed in the route map configuration command. Use the **no** form of this command to remove the setting.

```
set level {level-1 | level-2 | level-1-2 | stub-area | backbone}
```

```
no set level
```

Default configuration

None

Command mode

Route map configuration mode

In the example below, the OSPF routing protocol redistributes the RIP protocol to the backbone area.

Examples

```
Orion_B54Q(config)# router ospf
Orion_B54Q(config-router)# redistribute rip subnets route-map
redrip
Orion_B54Q(config-router)# network 192.168.12.0 0.0.0.255 area 0
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# route-map redrip permit 10
Orion_B54Q(config-route-map)# set level backbone
```

Related commands

Command	Description
match interface	Match the interface.

match ip address	Match the IP address.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric-type	Set the metric type.
set tag	Set the tag.

8.50 set local-preference

Use this command to set the **LOCAL_PREFERENCE** value for the routes to be redistributed in the route map configuration mode. Use the **no** form of this command to remove the setting.

set local-preference *number*

no set local-preference

Parameter	Parameter	Description
description	<i>number</i>	Local priority metric ranging 1 to 4294967295

Default configuration None

Command mode Route map configuration mode

Usage guideline Use this command to set the local preference for the matched routes. Only one local preference can be set.

Examples

```
Orion_B54Q(config)# route-map SET_PREF permit 10
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set local-preference 6800
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map SET_PREF permit 20
Orion_B54Q(config-route-map)# match as-path 2
Orion_B54Q(config-route-map)# set local-preference 50
```

Related commands	Command	Description
	match as-path	Match the AS_PATH attribute.
	match metric	Match the route metric.
	match origin	Match the source.
	set as-path prepend	Set the AS_PATH attribute.
	set metric	Set the metric.

set metric-type	Set the metric type.
------------------------	----------------------

8.51 set metric

Use **set metric** to set the metric for the routes to be redistributed. Use the **no** form of this command to remove the setting.

set metric [+ *metric-value* | - *metric-value* | *metric-value*]

no set metric

Parameter	Description
+	Increase based on the metric of the original route
-	Decrease based on the metric of the original route
<i>metric-value</i>	Metric for the route to be redistributed

Default

configuration

The default metric for route redistribution varies with the routing protocol.

Command mode

Route map configuration mode

Usage guideline

You should set the metric according to the actual network topology, because the routing depends on the metric of routes. Attention should be paid to the upper and lower limits of the routing protocols when you execute the **set metric**, **+ metric** or **- metric** commands. When the RIP protocol redistributes the routes of other protocols, the range of the metric after increase or decrease is 1 to 16.

You can redistribute the routes from one routing process to another routing process.

For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

For route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

One or more **match** or **set** commands can be executed to configure a route map. If the **match** command is not used, all the routes will be matched. If the **set** command is not used, no operation will be performed.

Examples

The following example enables the OSPF routing protocol to redistribute the RIP routes and sets the default metric to 40.

```
Orion_B54Q(config)# router ospf
Orion_B54Q(config-router)# redistribute rip subnets route-map
redrip
Orion_B54Q(config-router)# network 192.168.12.0 0.0.0.255 area 0
Orion_B54Q(config-router)# exit
```

```
Orion_B54Q(config)# route-map redrip permit 10
Orion_B54Q(config-route-map)# set metric 40
```

Related commands

Command	Description
match interface	Match the interface.
match ip address	Match the IP address.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric-type	Set the metric type.
set tag	Set the tag.

8.52 set metric-type

Use **set metric-type** to set the type of the routes to be redistributed. Use the **no** form of this command to remove the setting.

set metric-type *type*
 no set metric-type

Parameter description

Parameter	Description
<i>type</i>	Type of the routes to be redistributed. At present, you can set the type of the routes that the OSPF protocol redistributes. type-1: Type-1 external route; type-2: Type-2 external route.

Default

configuration Type-2

Command mode

Route map configuration mode

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.
 In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

Examples

The following example enables the OSPF routing protocol to redistribute the RIP route and

sets the type as type-1.

```
Orion_B54Q(config)# router ospf
Orion_B54Q(config-router)# redistribute rip subnets route-map
redrip
Orion_B54Q(config-router)# network 192.168.12.0 0.0.0.255 area 0
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# route-map redrip permit 10
Orion_B54Q(config-route-map)# set metric-type type-1
```

Related commands

Command	Description
match interface	Match the interface.
match ip address	Match the IP address.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set tag	Set the tag.

8.53 set mpls-label

Use this command to enable the system to assign an MPLS label to routes that meet the filter condition of the route map when route updates are sent to BGP peers. Use the no form of this command to disable this function.

- set mpls-label**
- no set mpls-label**

Parameter description	Parameter	Description
	-	-

Default If the rule is not specified in the associated route map policy, MPLS labels will not be assigned to IPv4 routes sent to BGP peers.

Command mode Route map configuration mode.

Usage guideline This command applies only to the route map associated in **neighbor route-map out, which is used to manage the policy of the BGP for filtering IPv4 routes sent to its peers.** This command takes effect only if you have used **neighbor send-label** to enable the BGP and its peers to exchange MPLS-labeled routes. Otherwise, routes will not be labeled. If this exchange function has been enabled but the associated route map does not configure **set mpls-label**, then

routes that meet the filtering condition will be assigned only IPv4 routes and not an MPLS label.

Examples The following example creates a route map. The route prefixed with 1.1.1.1/32 is assigned an MPLS label. The one prefixed with 1.1.1.2/32 is assigned only a common IPv4 route update without a label. Routes that do not meet the rules defined by acl1 and acl2 will not send route updates to neighbors.

```
Orion_B54Q (config)# ip access-list standard acl1
Orion_B54Q (config-std-nacl) # permit host 1.1.1.1
Orion_B54Q (config-std-nacl) # exit
Orion_B54Q (config)# ip access-list standard acl2
Orion_B54Q (config-std-nacl) # permit host 1.1.1.2
Orion_B54Q (config-std-nacl) # exit
Orion_B54Q (config)# route-map out-as permit 10
Orion_B54Q (config-route-map)# match ip address acl1
Orion_B54Q (config-route-map)# set mpls-label
Orion_B54Q (config-route-map) # exit
Orion_B54Q (config)# route-map out-as permit 20
Orion_B54Q (config-route-map)# match ip address acl2
```

Related command

Command	Description
neighbor send-label	Enable the function for the BGP and its peer to exchange routes with MPLS labels.
neighbor route-map out	Manage the policy for the BGP sending route updates to its peers.
match mpls-label	Manage the policy for BGP peers receiving routes. Only routes with labels will be received.
show ip bgp labels	Show BGP-learnt and BGP-sent routes with MLPS labels.

Platform description -

8.54 set next-hop

Use this command to specify the next-hop IP address for the routes that match the rule. Use the **no** form of this command to remove the setting. This command is only used to configure routing policies.

set next-hop *ip-address*
no set next-hop

Parameter	Parameter	Description
description	<i>ip-address</i>	IP address of the next hop.

Default configuration
n None

Command

mode Route map configuration mode

You can redistribute the routing information from one routing process to another routing process. For example, you can redistribute the route in the OSPF routing domain and then advertise it to the RIP routing domain, and vice versa. The mutual route redistribution can be implemented between all the IP routing protocols.

Usage guideline

In the route redistribution, route maps are usually used to control the mutual route redistribution between two routing domains.

In configuring one route map, one or more match or set commands can be executed. If the match command is not used, all the routes will be matched. If the set command is not used, no operation will be performed.

The following example enables the OSPF routing protocol to redistribute the RIP route and sets the next-hop to 192.168.1.2.

Examples

```
Orion_B54Q(config)# route-map redrip permit 10
Orion_B54Q(config-route-map)# match ip address 1
Orion_B54Q(config-route-map)# set next-hop 192.168.1.2
```

Related commands

Command	Description
match interface	Match the interface.
match ip address	Match the IP address.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric-type	Set the metric type.
set tag	Set the tag.

8.55 set origin

Use this command to set the source of the routes to be redistributed in the route map configuration mode. Use the **no** form of this command to remove the setting.

set origin {egp | igp | incomplete}

no set origin {egp | igp | incomplete}

Parameter description

Parameter	Description
egp	Redistribute the routes from the remote EGP.
igp	Redistribute the routes from the local IGP.
incomplete	Redistribute the routes from an unknown device.

Default

configuration None

Command mode Route map configuration mode

Usage guideline Use this command to set the source of the routes to be matched. Only one route source attribute can be set.

Examples

```
Orion_B54Q(config)# route-map SET_ORIGIN 10 permit
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set origin igp
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map SET_ORIGIN 20 permit
Orion_B54Q(config-route-map)# match as-path 2
Orion_B54Q(config-route-map)# set origin egp
```

Related commands

Command	Description
match as-path	Match the AS_PATH attribute.
match metric	Match the route metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set local-preference	Set the local priority of redistributed routes.

8.56 set originator-id

Use this command to set the source of the routes to be redistributed in the route map configuration mode. Use the **no** form of this command to remove the setting.

set originator-id *ip-addr*
no set originator-id [*ip-addr*]

Parameter	Parameter	Description
description	<i>ip-addr</i>	IP address of the originator.

Default

configuration None

Command mode Route map configuration mode

Usage guideline Use this command to set the source of the routes to be matched.

Examples

```
Orion_B54Q(config)# route-map SET_ORIGIN 10 permit
Orion_B54Q(config-route-map)# match as-path 1
Orion_B54Q(config-route-map)# set originator-id 5.5.5.5
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map SET_ORIGIN 20 permit
Orion_B54Q(config-route-map)# match as-path 2
Orion_B54Q(config-route-map)# set originator-id 5.5.5.6
```

Related commands

Command	Description
match as-path	Match the AS_PATH attribute.
match metric	Match the route metric.
match origin	Match the source.
set as-path prepend	Set the AS_PATH attribute.
set metric	Set the metric.
set local-preference	Set the local priority of redistributed routes.

8.57 set tag

Use this command to set the tag for the routes to be redistributed. Use the **no** form of this command to remove the setting.

set tag tag
no set tag

Parameter description

Parameter	Description
<i>tag</i>	Tag of the route to be redistributed

Default

configuration The original routing tag remains unchanged.

Command mode Route map configuration mode

Usage guideline This command can only be used for route redistribution. If this command is not configured, the default route tag is used.

Examples

The following example enables the OSPF routing protocol to redistribute the RIP route and sets the tag as 100.

```
Orion_B54Q(config)# router ospf
Orion_B54Q(config-router)# redistribute rip subnets route-map redrip
Orion_B54Q(config-router)# network 192.168.12.0 0.0.0.255 area 0
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# route-map redrip permit 10
```



```
Orion_B54Q(config-route-map)# set tag 100
```

Related commands

Command	Description
match interface	Match the interface.
match ip address	Match the IP address.
match ip next-hop	Match the next-hop IP address.
match ip route-source	Match the source IP address.
match metric	Match the metric.
match route-type	Match the route type.
match tag	Match the tag.
set metric	Set the metric.
set metric-type	Set the metric type.

8.58 set weight

Use this command to set the weight for the BGP routes matching filtering rules. Use the **no** form of this command to remove the setting.

set weight *number*
no set weight

Parameter	Parameter	Description
description	<i>number</i>	Weight in the range of 0 to 65535

Default configuration None

Command mode Route map configuration mode

Usage guideline This command can only be used modify the weight of a BGP route.
 By default, the weight of the route learned from a neighbor is the one configured with the neighbor weight command. The weight of the locally generated route is fixed 32768.

The following example sets the weight for the BGP route learned from the neighbor 1.1.1.1 at the inbound direction to 100.

```
Orion_B54Q(config)# router bgp 1
Orion_B54Q(config-router)# neighbor 1.1.1.1 route-map nei-rmap-in in
Orion_B54Q(config-router)# exit
Orion_B54Q(config)# route-map nei-rmap-in permit 10
Orion_B54Q(config-route-map)# set weight 100
```

Examples

Related commands

Command	Description
match as-path	Match the AS_PATH attribute.
match community	Match the route community.
match metric	Match the route metric.
match origin	Match the source.
set community	Set community of the redistributed route.
set metric	Set the metric of the redistributed route.
set metric type	Set the metric type of the redistributed route.

8.59 show ip as-path-access-list

Use this command to display the configuration of AS path access lists.

show ip as-path-access-list [num]

Parameter description

Parameter	Description
<i>num</i>	AS path access list number.

Default

N/A

Command mode

Privileged EXEC mode

Usage guideline

N/A

Examples

The following example displays the AS path access lists.

```
Orion_B54Q# show ip as-path-access-list
AS path access list 30
permit ^30$
```

Field	Description
AS path access list	AS path access list number
permit	Permits advertisement based on matching conditions.
^30\$	Regular expression.

Related command

Command	Description
-	-

Platform description

-

8.60 show ip community-list

Use **show ip community-list** command to display the community list.

show ip community-list [*community-list-number* | *community-list-name*]

Parameter	Parameter	Description
description	<i>community-list-number</i>	Number of the community list.
	<i>community-list-name</i>	Name of the community list.

Default configuration None

Command mode Privileged EXEC mode

Usage guidelines N/A

Examples

```
Orion_B54Q# show ip community-list
Community-list standard local
permit local-AS
Community-list standard Red-Giant
permit 0:10
deny 0:20
```

Related commands

Command	Description
match community	Match the route community.
set comm-list delete	Delete the community attribute in the BGP routes.

8.61 show ip extcommunity-list

Use this command to display the extcommunity list.

show ip extcommunity-list [*extcommunity-list-num* | *extcommunity-list-name*]

Parameter	Parameter	Description
description	<i>extcommunity-list-num</i>	extcommunity-list number, ranging from 1 to 199.
	<i>extcommunity-list-name</i>	extcommunity-list name.

Default -

Command mode Privileged EXEC mode.

Usage guideline -

Examples

```
Orion_B54Q # show ip extcommunity-list
```

```
Standard extended community-list 1
 10 permit RT:1:200
 20 permit RT:1:100
Standard extended community-list 2
 10 permit RT:1:200
Expanded extended community-list rt_filter
 13 permit 1:100
```

Related command

Command	Description
ip extcommunity-list	Create an extcommunity-list.
match extcommunity	Match an extcommunity.
set extcommunity	Set an extcommunity.

Platform description -

8.62 show ip prefix-list

Use **show ip prefix-list** to display the prefix list or the entries.

show ip prefix-list [*prefix-name*]

Parameter	Parameter	Description
description	<i>prefix-name</i>	Name of the prefix list.

Default

configuration The configuration information of all the prefix lists is displayed by default.

Command mode

Privileged EXEC mode, global configuration mode, interface configuration mode, routing protocol configuration mode, route map configuration mode.

Usage guidelines

If no prefix list is specified, the configurations of all the prefix lists are displayed, otherwise only the configuration of the specified prefix list is displayed.

Examples

```
Orion_B54Q# show ip prefix-list
ip prefix-list name : test
seq pre: 2 entries
seq 5 permit 192.168.564.0/24
seq 10 permit 192.2.2.0/24
```

8.63 show ipv6 prefix-list

Use this command to display the information about the IPv6 prefix list or its entries.

show ipv6 prefix-list [*prefix-name*]

Parameter	Parameter	Description
description	<i>prefix-name</i>	Name of the IPv6 prefix list.

Default configuration The configuration information of all the IPv6 prefix lists is displayed.

Command mode Privileged EXEC mode, global configuration mode, interface configuration mode, route protocol configuration mode, route map configuration mode

Usage guideline If no prefix list is specified, the configurations of all the prefix lists are displayed, otherwise only the configuration of the specified prefix list is displayed.

Examples

```
Orion_B54Q# show ipv6 prefix-list
Ipv6 prefix-list p6 : 2 entries
permit 13::/20
```

8.64 show key chain

Use this command to display the key chain configuration.

show key chain [*key-chain-name*]

Parameter description	Parameter	Description
	<i>key-chain-name</i>	(Optional) Display the configuration of the specified key chain.

Default The configuration information of all key chains is displayed.

Command mode Privileged EXEC mode, global configuration mode, interface configuration mode, routing protocol configuration mode, and key chain configuration mode.

Usage guideline If no key chain is specified, the configuration information of all key chains is displayed.

Examples

```
Orion_B54Q# sh key chain
key chain ripkeys
  key 1 -- text "abc"
  accept-lifetime (00:00:00 Sep 09 2000) - (00:00:00 Dec 12 2011)
  send-lifetime (00:00:00 Sep 09 2000) - (00:00:00 Dec 12 2011)
```

Field	Description
key chain	Key chain name.
key	Key ID.
text	Key string.
accept-lifetime	Lifetime in the accept direction.
send-lifetime	Lifetime in the send direction.

Related command

Command	Description
-	-

Platform description

-

8.65 show route-map

Use the command to display the configuration of the route map.

show route-map [*route-map-name*]

Parameter description

Parameter	Description
<i>route-map-name</i>	(Optional) Display the configuration information of the specified the route map.

Default configuration

The configuration information of all the route maps is displayed.

Command mode

Privileged EXEC mode, global configuration mode, interface configuration mode, routing protocol configuration mode, route map configuration mode.

Usage guidelines

If no route map is specified, the configurations of all the route maps will be displayed, otherwise only the configuration of the specified route map is displayed.

Examples

```
Orion_B54Q# show route-map
route-map AAA, permit, sequence 10
Match clauses:
ip address 2
Set clauses:
metric 10
```

Field	Description
route-map	Name of the route map.

Permit	The route map contains the permit keyword.
sequence 10	Sequence number of the route map.
Match clauses	Set the matching rule. Whether to perform the set operation depends on the permit or deny keyword in the route map.
Set clauses	Set the operation when the rule is matched.

9 PBR Commands

9.1 clear ip pbr statistics

Use this command to clear the IPv4 PBR forwarded packet count.

clear ip pbr statistics [**interface** *if-name* | **local**]

Parameter Description

Parameter	Description
interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the device clears the IPv4 PBR forwarded packet count on that interface. Otherwise, the device clears the IPv4 PBR forwarded packet count on every interface where IPv4 PBR is enabled.
local	Clears the IPv4 PBR forwarded packet count on the local interface.

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide Use this command to clear the IPv4 PBR forwarded packet count.

Configuration Examples The following example clears the IPv4 PBR forwarded packet count.

```
Orion_B54Q#clear ip pbr statistics
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

9.2 clear ipv6 pbr statistics

Use this command to clear the IPv6 PBR forwarded packet count.

clear ipv6 pbr statistics [**interface** *if-name* | **local**]

Parameter Description

Parameter	Description
interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the device clears the IPv6 PBR forwarded packet count on that interface. Otherwise, the device clears the IPv6 PBR forwarded packet count on every interface where IPv6 PBR is enabled.

local	Clears the IPv6 PBR forwarded packet count on the local interface.
--------------	--

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide Use this command to clear the IPv6 PBR forwarded packet count.

Configuration Examples The following example clears the IPv6 PBR forwarded packet count.

```
Orion_B54Q#clear ipv6 pbr statistics
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

9.3 ip local policy route-map

Use this command to apply the policy-based routing (PBR) on the packets sent locally. Use the **no** form of this command to restore the default setting.

ip local policy route-map *route-map*

no ip local policy route-map

Parameter Description

Parameter	Description
<i>route-map</i>	Name of the route map

Defaults This function is disabled by default.

Command Mode Global configuration mode

Usage Guide This command is valid for the IP packets sent locally, but not the IP packets received locally. The IP packets received by the local are free from this command.

To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

The **set interface** command for the policy-based routing does not support the load-balancing and only supports the redundancy backup.

Configuration The following examples send the packets with the source address 192.168.217.10 from the serial

n Examples 2/0.

The following example defines an ACL that match the IP packet.

```
Orion_B54Q(config)#access-list 1 permit 192.168.217.10
```

The following example defines the route map.

```
Orion_B54Q(config)#route-map lab1 permit 10
Orion_B54Q(config-route-map)#match ip address 1
Orion_B54Q(config-route-map)#set interface serial 2/0
Orion_B54Q(config-route-map)#exit
```

The following example applies PBR on the local interface.

```
Orion_B54Q(config)#ip local policy route-map lab1
```

Related Commands

Command	Description
access-list	Defines the access list rule.
route-map	Defines the route map.
set vrf	Defines the VRF instance of the policy-based IP packet.
set ip next-hop	Defines the next hop of the policy-based routing.
set ip default next-hop	Defines the default next hop of the policy-based routing.
set interface	Defines the output port of the policy-based routing.
set default interface	Defines the default policy-based routing output port.
set ip tos	Sets the TOS in the head of the IP packet.
set ip dscp	Sets the DSCP of the IP packet.
set ip precedence	Sets the priority level in the head of the IP packet.
match ip address	Sets the filtering rule.
match length	Matches the packet length.

Platform N/A

Description

9.4 ip policy

Use this command to set the policy: redundant backup or load balancing used between multiple next hops of the PBR applied for the **set ip [default] nexthop** command in global configuration mode. Use the **no** form of this command to restore the default setting.

ip policy { load-balance | redundance }

no ip policy


Parameter Description	Parameter	Description
	load-balance redundance	Specifies the policy: load balancing or redundant backup.

Defaults Redundant backup is adopted by default.

Command Global configuration mode

Mode

Usage Guide When you configure the **set ip next-hop** command in sub-route map, it is possible to configure multiple next hops. However, when you set redundant backup, only the first resolved next hop of the policy-based routing takes effect. When the load balancing is set, multiple resolved next hops of the policy-based routing take effect. The WCMP can be set up to 8 next hops, and the ECMP can be set up to 32 next hops. The resolved next hop refers to the ARP message learned by the next hop and the MAC address corresponding to this ARP exists in the MAC address table.

 NPE80 does not support this command.

Configuration Examples In the example below, there are multiple next hops configured in the route map. After the redundant backup is set in global configuration mode, only the first next hop among the sub-route map of the policy-based routing applied on the interface FastEthernet 0/0 takes effect.

The following example sets the ACL that match the IP packet.

```
Orion_B54Q(config)#access-list 1 permit 10.0.0.1
Orion_B54Q(config)#access-list 2 permit 20.0.0.1
```

The following example defines the route map.

```
Orion_B54Q(config)#route-map lab1 permit 10
Orion_B54Q(config-route-map)#match ip address 1
Orion_B54Q(config-route-map)#set ip next-hop 196.168.4.6
Orion_B54Q(config-route-map)#set ip next-hop 196.168.4.7
Orion_B54Q(config-route-map)#set ip next-hop 196.168.4.8
Orion_B54Q(config-route-map)#exit
Orion_B54Q(config)#route-map lab1 permit 20
Orion_B54Q(config-route-map)#match ip address 2
Orion_B54Q(config-route-map)#set ip next-hop 196.168.5.6
Orion_B54Q(config-route-map)#set ip next-hop 196.168.5.7
Orion_B54Q(config-route-map)#set ip next-hop 196.168.5.8
Orion_B54Q(config-route-map)#exit
```

The following example applies the policy-based routing on the interface.

```
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ip policy route-map lab1
Orion_B54Q(config-if)#exit
Orion_B54Q(config)#ip policy redundance
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

9.5 ip policy route-map

Use this command to apply the policy-based routing on an interface. Use the **no** form of this command to restore the default setting.


ip policy route-map *route-map*
no ip policy route-map

Parameter Description	Parameter	Description
	<i>route-map</i>	Name of the route map

Defaults This function is disabled by default.

Command Mode Interface configuration mode

Usage Guide The policy-based routing must be applied on the specified interface. That interface performs the policy-based routing only on the received packets. To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

 Up to one route map can be configured on an interface. When you configure a route map on the interface for many times, the latter will overwrite the former.

Configuration Examples In the example below, when the interface FastEthernet0/0 receives a datagram, if the source address of the datagram is 10.0.0.1, it sets the next-hop as 196.168.4.6; if the source address is 20.0.0.1, it sets the next-hop as 196.168.5.6; otherwise, the general forwarding will be performed.

The following example sets the ACL matched with the IP packets.

```
Orion_B54Q(config)#access-list 1 permit 10.0.0.1
Orion_B54Q(config)#access-list 2 permit 20.0.0.1
```

The following example defines the route map.

```
Orion_B54Q(config)#route-map lab1 permit 10
Orion_B54Q (config-route-map)#match ip address 1
Orion_B54Q(config-route-map)#set ip next-hop 196.168.4.6
```

```
Orion_B54Q(config-route-map)#exit
Orion_B54Q(config)#route-map lab1 permit 20
Orion_B54Q(config-route-map)#match ip address 2
Orion_B54Q(config-route-map)#set ip next-hop 196.168.5.6
Orion_B54Q(config-route-map)#exit
```

The following example applies the route map on the interface.

```
Orion_B54Q(config)#interface FastEthernet 0/0
Orion_B54Q(config-if)#ip policy route-map lab1
Orion_B54Q(config-if)#exit
```

Related Commands

Command	Description
access-list	Defines the access list rule.
route-map	Defines the route map.
set vrf	Defines the VRF instance of the policy-based IP packet.
set ip next-hop	Defines the next hop of the policy-based routing.
set ip default next-hop	Defines the default next hop of the policy-based routing.
set interface	Defines the policy-based routing output port.
set default interface	Defines the default policy-based routing output port.
set ip tos	Sets the TOS in the head of the IP packet.
set ip dscp	Sets the DSCP of the IP packet.
set ip precedence	Sets the priority level in the head of the IP packet.
match ip address	Sets the filtering rule.
match length	Matches the packet length.

Platform N/A

Description

9.6 ipv6 local policy route-map

Use this command to enable the policy-based routing on the packets sent locally. Use the **no** form of this command to restore the default setting.

ipv6 local policy route-map *route-map-name*

no ipv6 local policy route-map

Parameter Description

Parameter	Description
<i>route-map-name</i>	Name of the router map applied locally, which is configured by the

	router-map command.
--	----------------------------

Defaults This function is disabled by default.

Command Mode Global Configuration mode

Usage Guide

- This command is valid only for the IPv6 packets in accordance with the policy (for example, ping packets used for management) sent locally, but not the packets received locally.
- To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

Configuration Examples The following examples displays the PBR application process: The device sends the packets from the source address 2003:1000::10/80 to the 2001:100::/64, the packets will match ACL6 of aaa and be sent to the device 2003:1001::2.

- The following example defines the ACL matched with the IPv6 packet:

```
Orion_B54Q(config)#ipv6 access-list aaa
Orion_B54Q(config)#permit ipv6 2003:1000::10/80 2001:100::/64
```

- The following example defines the router map.

```
Orion_B54Q(config)#route-map pbr-aaa permit 10
Orion_B54Q(config-route-map)#match ipv6 address aaa
Orion_B54Q(config-route-map)#set ipv6 next-hop 2003::1001::2
```

- The following example applies the PBR on the device.

```
Orion_B54Q(config)#ipv6 local policy route-map pbr-aaa
```

Related Commands

Command	Description
match ipv6 address	Sets the ACL6 used to match the IPv6 packets in the IPv6 PBR.
match length	Defines the length of matched packets.
route-map	Defines the route map for PBR.
set default interface	Defines the default next hop output port.
set interface	Defines the next hop output port.
set ipv6 default next-hop	Sets the default next hop of packet forwarding.
set ipv6 next-hop	Sets the next hop of packet forwarding.
set ipv6 precedence	Sets the priority field in the head of IPv6

	packets.
show ipv6 policy	Displays the current PBR application.
show route-map	Displays the current router map configuration.

Platform N/A
Description

9.7 ipv6 policy

Use this command to set the policy: redundant backup or load balancing, applied for the **set ip nexthop** command in global configuration mode. Use the **no** form of this command to restore the default setting.

ipv6 policy { load-balance | redundancy }
no ipv6 policy

Parameter Description	Parameter	Description
	load-balance	Sets the policy as load balancing.
	redundance	Sets the policy as redundant backup.

Defaults Redundant backup is adopted by default.

Command Mode Global configuration mode


Usage Guide This command is valid for the IP packets sent locally, but not the IP packets received locally. The IP packets received by the local are free from this command.

To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

The **set interface** command for the policy-based routing does not support the load-balancing and only supports the redundancy backup.

Configuration Examples This function is valid for the multiple next-hops.
 When you configure the set ip next-hop command in sub-route map, it is possible to configure multiple next hops. However, when you set redundant backup, only the first resolved next hop takes effect. The second configured next hop will take effect only when the first one fails and the first next hop will take effect again if it recovers.

When the load balancing is set, multiple next hops of the policy-based routing take effect. The WCMP can be set up to 8 next hops, and the ECMP can be set up to 32 next hops.

 The resolved next hop refers to the learned MAC address for the next-hop.

The following example sets load-balancing mode for multiple nexthops.

The following example configures an ACL matching with IP packets.

```
Orion_B54Q(config)# ipv6 access-list 1
Orion_B54Q(config-ipv6-acl )# permit ipv6 1000::1 any
Orion_B54Q(config)# ipv6 access-list 2
Orion_B54Q(config-ipv6-acl )# permit ipv6 2000::1 any
```

The following example defines a route map.

```
Orion_B54Q(config)# route-map lab1 permit 10
Orion_B54Q(config-route-map)# match ipv6 address 1
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::1
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::2
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::3
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map lab1 permit 20
Orion_B54Q(config-route-map)# match ipv6 address 2
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::5
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::6
Orion_B54Q(config-route-map)# set ipv6 next-hop 2002::7
Orion_B54Q(config-route-map)# exit
```

The following example applies policy-based routing on the interface.

```
Orion_B54Q(config)# interface FastEthernet 0/0
Orion_B54Q(config-if)# ipv6 policy route-map lab1
Orion_B54Q(config-if)# exit
Orion_B54Q(config)# ipv6 policy load-balance
```

Related Commands

Command	Description
set ipv6 default next-hop	Defines the default next hop for forwarding the packets.
set ipv6 next-hop	Defines the next hop for forwarding the packets.
show ipv6 policy	Displays the current policy-based routing application.

Platform N/A

Description

9.8 ipv6 policy route-map

Use this command to apply the policy-based routing on an interface in interface configuration mode.

Use the **no** form of this command to restore the default setting.

ipv6 policy route-map *route-map-name*

no ip policy route-map

Parameter	Parameter	Description
-----------	-----------	-------------

Description	
<i>route-map-name</i>	Name of the PBR router map applied locally, which is configured by the router-map command.

Defaults This function is disabled by default..

Command Interface configuration mode

Mode

Usage Guide The policy-based routing must be applied on the specified interface. That interface performs the policy-based routing only on the received packets.

To use the policy-based routing, you must specify the route map for it and create the route map. A route map contains multiple policies, and each policy defines one or more match rules and the corresponding operations. After policy-based routing is applied to an interface, the packets received by the interface will be checked. The packets that do not match any policy in the route map will be forwarded to the usual route. The packets that match a policy in the route map will be processed according to the operation defined in the policy.

▲ Up to one route map can be configured on an interface. When you configure a route map on the interface for many times, the latter will overwrite the former.

Configuration Examples An IPv6 packet is received on the fastEthernet 0/0. If the packet is sent from 10::/64 network segment, it is forwarded to the next hop of 2000:1; if the packet is sent from 20::/64 network segment, it is forwarded to the next hop of 2000:2 or forwarded as usual.:

The following example configures an ACL matched with the IP packet.

```
Orion_B54Q(config)# ipv6 access-list acl_for_pbr1
Orion_B54Q (config-ipv6-acl)# permit ipv6 10::/64 any
Orion_B54Q(config)# ipv6 access-list acl_for_pbr2
Orion_B54Q (config-ipv6-acl)# permit ipv6 20::/64 any
```

The following example defines a route map.

```
Orion_B54Q(config)# route-map rm_pbr permit 10
Orion_B54Q (config-route-map)# match ipv6 address acl_for_pbr1
Orion_B54Q(config-route-map)# set ipv6 next-hop 2000::1
Orion_B54Q(config-route-map)# exit
Orion_B54Q(config)# route-map rm_pbr permit 20
Orion_B54Q(config-route-map)# match ipv6 address acl_for_pbr2
Orion_B54Q(config-route-map)# set ipv6 next-hop 2000::2
Orion_B54Q(config-route-map)# exit
```

The following example applies the route map to the interface.

```
Orion_B54Q(config)# interface FastEthernet 0/0
Orion_B54Q(config-if)# no switchport
Orion_B54Q(config-if)# ipv6 policy route-map rm_pbr
Orion_B54Q(config-if)# exit
```

Related	Command	Description
----------------	----------------	--------------------

Commands

route-map	Defines the route map.
match ipv6 address	Sets the IPv6 ACL used to match the IPv6 packets in the IPv6 PBR.
set ipv6 default next-hop	Defines the default next hop of the packet forwarding.
set ipv6 next-hop	Defines the next hop of the packet forwarding.
show ipv6 policy	Displays the current policy-based routing application.
show route-map	Displays the current route map configurations.

Platform N/A

Description

9.9 show ip pbr route

Use this command to display the IPv4 PBR information on the interface.

show ip pbr route [**interface** *if-name* | **local**]

Parameter Description

Parameter	Description
interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the IPv4 BPR information of this interface is displayed. Otherwise, the IPv4 BPR information of all interfaces where the IPv4 PBR is enabled is displayed.
local	Displays the IPv4 PBR information on the local interface

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide Use this command to display the IPv4 PBR information.

Configuration Examples The following example displays the IPv4 PBR information on the interfaces.

```
Orion_B54Q#show ip pbr route
PBR IPv4 Route Summay : 1
Interface       : GigabitEthernet 0/1
  Sequence      : 10
  ACL[0]        : 2900
ACL_CLS[0]     : 0
  Min Length    : None
  Max Length    : None
  VRF ID        : 0
  Route Flags   :
```

```

Route Type      : PBR
Direct         : Permit
Priority       : High
Tos_Dscp      : None
Precedence    : None
Tos_Dscp      : 0
Precedence    : 0
Mode          : redundance
Nexthop Count : 1
Nexthop[0]    : 192.168.8.100
Weight[0]     : 1
Ifindex[0]    : 2
    
```

Parameter	Description
PBR IPv4 Route Summay	IPv4 PBR route count.
Interface	Interface where IPv4 PBR is enabled.
Sequence	The PBR serial number.
ACL	The ACL ID used in the match rule.
ACL_CLS	The ACL type used in the match rule, such as the IP standard ACL.
Min Length	The minimum match length.
Max Length	The maximum match length.
VRF ID	Port-correlated VRF ID.
Route Flags	PBR flag bit: Route Type: "PBR" indicates PBR routes. "Normal" indicates common routes. Direct: PBR matching action, permit or deny Priority: PBR priority, High or Low Tos_Dscp: Displays whether the tos rule or the dscp rule is configured. Precedence: Displays whether the set ip precedence rule is configured.
Mode	Specifies the redundancy mode or the next hop load balancing mode.
Nexthop Count	Specifies the next hop number. ECMP supports up to 32 next hops.
Nexthop	Specifies the next hop IP address.
Weight	Specifies the next hop weight.
Ifindex	Specifies the outbound interface index corresponding to the next hop.

Related

Command	Description
---------	-------------

Commands		
	N/A	N/A

Platform N/A
Description

9.10 show ip pbr route-map

Use this command to display the IPv4 PBR route-map information.

show ip pbr route-map *route-map-name*

Parameter Description	Parameter	Description
	<i>route-map-name</i>	The route-map name.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the IPv4 PBR route-map information.

```
Orion_B54Q#show ip pbr route-map rm
Pbr VRF: GLOBAL, ID: 0
  Forward Mode: redundance
  Forwarding: On

route-map rm
  route-map index: sequence 10, permit
  Match rule:
    ACL ID :      0, ACL CLS: 0, Name: acl1
  Set rule:
    IPv4 Nexthop: 192.168.8.100, (VRF Name: , ID: 0), Weight: 0, Flags:
0
    PBR state info ifx: GigabitEthernet 0/1, Connected: true, Track
State: valid, Flags: 0
```

Field	Description
Pbr VRF	VRF name and VRF ID.
Forward Mode	Sets the load balance mode or the redundancy mode for the next hop.
Forwarding	Displays whether the IP route forwarding is enabled.
Route-map index	The serial number and the type of the sub-map.

Match rule	Match rule.
Set rule	Set rule.
PBR state info	PBR private data information, such as outbound interface and the link state of the next hop.

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

9.11 show ip pbr statistics

Use this command to display the IPv4 PBR forwarded packet count.

show ip pbr statistics [interface *if-name* | local]

Parameter Description	Parameter	Description
	interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the IPv4 PBR forwarded packet count of this interface is displayed. Otherwise, the IPv4 PBR forwarded packet count of all interfaces where the IPv4 PBR is enabled is displayed.
	local	Displays the IPv4 PBR forwarded packet count on the local interface.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the IPv4 PBR forwarded packet count.

```
Orion_B54Q#show ip pbr statistics
IPv4 Policy-based route statistic
gigabitEthernet 0/1
statistics : 10
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

9.12 show ip policy

Use this command to display the interface configured with the policy-based routing and the name of route map applied on the interface.

show ip policy [*route-map-name*]

Parameter Description	Parameter	Description
	<i>route-map-name</i>	Specifies a route map to be applied on the interfaces.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide You can use this command to verify the current PBR configured in the system.

Configuration Examples The following example displays the current PBR configured in the system.

```
Orion_B54Q#show ip policy
Banalance Mode: redundance
Interface          Route map
local              test
FastEthernet 0/0   test
```

Related Commands	Command	Description
	ip policy route-map	Applies the policy-based routing on the interface.
	ip local policy route-map	Applies the policy-based routing on the local interface.

Platform Description N/A

9.13 show ipv6 pbr route

Use this command to display the IPv6 PBR information on the interface.

show ipv6 pbr route [*interface if-name* | **local**]

Parameter Description	Parameter	Description
	interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the IPv6 BPR information of this interface is displayed. Otherwise, the IPv6 BPR information of all interfaces where the IPv6 PBR is enabled is displayed.
	local	Displays the IPv6 PBR information on the local interface.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the IPv6 PBR information on the interfaces.

```

Orion_B54Q#show ipv6 pbr route
PBR IPv6 Route Summary : 1
Interface      : GigabitEthernet 0/2
  Sequence     : 10
  ACL[0]       : 2901
ACL_CLS[0]    : 0
  Min Length   : None
  Max Length   : None
  VRF ID       : 0
  Route Flags  :
    Route Type : PBR
    Direct     : Permit
    Priority    : High
    Tos_Dscp   : None
    Precedence : None
  Tos_Dscp     : 0
  Precedence   : 0
  Mode         : redundance
  Nexthop Count : 1
    Nexthop[0] : 10::1
    Weight[0]  : 1
    Ifindex[0] : 3
    
```

Parameter	Description
PBR IPv4 Route Summay	IPv4 PBR route count.
Interface	Interface where IPv4 PBR is enabled.
Sequence	The PBR serial number.
ACL	The ACL ID used in the match rule.
ACL_CLS	The ACL type used in the match rule, such as the IP standard ACL.
Min Length	The minimum match length.
Max Length	The maximum match length.
VRF ID	Port associated VRF ID.
Route Flags	PBR flag bit: Route Type: "PBR" indicates PBR routes. "Normal" indicates common

	<p>routes.</p> <p>Direct: PBR matching action, permit or deny</p> <p>Priority: PBR priority, High or Low</p> <p>Tos_Dscp: Displays whether the tos rule or the dscp rule is configured.</p> <p>Precedence: Displays whether the set ip precedence rule is configured.</p>
Mode	Specifies the redundancy mode or the load balance mode for the next hop.
Nexthop Count	Specifies the next hop number. ECMP supports up to 32 next hops.
Nexthop	Specifies the next hop IP address.
Weight	Specifies the next hop weight.
Ifindex	Specifies the outbound interface index corresponding to the next hop

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

9.14 show ipv6 pbr route-map

Use this command to display the IPv6 PBR route-map information.

show ipv6 pbr route-map *route-map-name*

Parameter Description	Parameter	Description
	<i>route-map-name</i>	

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the IPv6 PBR route-map information.

```
Orion_B54Q#show ipv6 pbr route-map rm6
Pbr VRF: GLOBAL, ID: 0
Forward Mode: redundance
Forwarding: On
```



```

route-map rm6
  route-map index: sequence 10, permit
Match rule:
  ACL ID :      0, ACL CLS: 0, Name: acl6
  Set rule:
    IPv6 Nexthop: 10::1, (VRF Name: , ID: 0), Weight: 0, Flags: 0
    PBR state info ifx: GigabitEthernet 0/0, Connected: true, Track
State: valid, Flags: 0
    
```

Field	Description
Pbr VRF	VRF name and VRF ID.
Forward Mode	Sets the load balancing mode or to the redundancy mode for the next hop.
Forwarding	Displays whether the IP route forwarding is enabled.
Route-map index	The serial number and the type of the sub-map.
Match rule	Match rule
Set rule	Set rule.
PBR state info	PBR private data information, such as outbound interface and the link state of the next hop.

Related Commands

Command	Description
N/A	N/A

Platform

N/A

Description

9.15 show ipv6 pbr statistics

Use this command to display the IPv6 PBR forwarded packet count.

show ip pbr statistics [interface *if-name* | local]

Parameter Description

Parameter	Description
interface <i>if-name</i>	Specifies the interface name. If the interface name is specified, the IPv6 PBR forwarded packet count of this interface is displayed. Otherwise, the IPv6 PBR forwarded packet count of all interfaces where the IPv6 PBR is enabled is displayed.
local	Displays the IPv6 PBR forwarded packet count on the local interface.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the IPv6 PBR forwarded packet count.

```
Orion_B54Q#show ipv6 pbr statistics
IPv6 Policy-based route statistic
  gigabitEthernet 0/1
    statistics : 20
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A

Description

9.16 show ipv6 policy

Use this command to display which interfaces are configured with IPv6 PBR.

show ipv6 policy [*route-map-name*]

Parameter Description	Parameter	Description
		<i>route-map-name</i>

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the current PBR applied in the system.

```
Orion_B54Q#show ipv6 policy
Banlance Mode: redundance
Interface          Route map
VLAN 1             RM_for_Vlan_1
VLAN 2             RM_for_Vlan_2
```

Field	Description
Balance Mode	The current PBR running mode.
Interface	The name of interface with PBR applied.
Route map	The name of route map applied on the

interface.

Related Commands	Command	Description
	show route-map	Displays the current configured route map.

Platform N/A
Description

9.17 show ip pbr bfd

Use this command to display the correlation between the IPv4 policy router and BFD.

show ip pbr bfd

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the correlation between the IPv4 policy router and BFD.

```
Orion_B54Q# show ip pbr bfd
VRF ID  Ifindex  Host           State  Refcnt
      0      13  192.168.8.100  Up     2
```

Field Description

Field	Description
VRF ID	VRF of BFD neighbors correlated with the policy router
Ifindex	The interface index of BFD neighbors correlated with the policy router
Host	The peer IPv4 address
State	Up/Down status of BFD neighbors correlated with the policy router
Refcnt	Calculation referred by BFD neighbors

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

9.18 show ipv6 pbr bfd

Use this command to display the correlation between the IPv6 policy router and BFD.

show ipv6 pbr bfd

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the correlation between the IPv6 policy router and BFD.

```
Orion_B54Q# show ipv6 pbr bfd
VRF ID  Ifindex  Host                               State  Refcnt
      0      13  2000: : 2                          Up      1
```

Field Description

Field	Description
VRF ID	VRF of BFD neighbors correlated with the policy router
Ifindex	The interface index of BFD neighbors correlated with the policy router
Host	The peer IPv6 address
State	Up/Down status of BFD neighbors correlated with the policy router
Refcnt	Calculation referred by BFD neighbors

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

10 VRF Commands

10.1 address-family

Use this command to configure an IPv4 address family or IPv6 address family for a multiprotocol VRF.

address-family { **ipv4** | **ipv6** }

Parameter Description

Parameter	Description
ipv4	Enters IPv4 address family.
ipv6	Enters IPv6 address family.

Defaults

No IPv4 address family or IPv6 address family is configured for a multiprotocol VRF.

Command mode

VRF configuration mode

Usage Guide

This command is applicable only to the multiprotocol VRF.

Configuration Examples

The following example defines a multiprotocol VRF vrf1 and configures an IPv4 address family.

```
Orion_B54Q(config)#vrf definition vrf1
Orion_B54Q(config-vrf)#address-family ipv4
Orion_B54Q(config-vrf-af)#
```

Related Commands

Command	Description
exit-address-family	Exits the VRF address family configuration mode.
vrf definition	Defines a multiprotocol VRF.

Platform

N/A

Description

10.2 description

Use this command to configure the VRF description.

description *string*

Parameter Description

Parameter	Description
<i>string</i>	VRF description character string. The maximum length is 244 characters.

Defaults No VRF description is configured by default .

Command mode VRF configuration mode

Usage Guide N/A

Configuration Examples The following example defines a single-protocol IPv4 VRF vrf1 and configure the description to vpn-a.

```
Orion_B54Q(config)#ip vrf definition vrf1
Orion_B54Q(config-vrf)#description vpn-a
```

The following example defines a multiprotocol VRF vrf2 and configure the description to vpn-b.

```
Orion_B54Q(config)#vrf definition vrf1
Orion_B54Q(config-vrf)#description vpn-b
```

Related Commands

Command	Description
ip vrf	Defines a single-protocol IPv4 VRF.
vrf definition	Defines a multiprotocol VRF.

Platform N/A

Description

10.3 exit-address-family

Use this command to exit VRF address family configuration mode.

exit-address-family

Parameter Description

Parameter	Description
N/A	N/A

Defaults N/A

Command mode VRF address family configuration mode

Usage Guide N/A

Configuration Examples The following example defines a multiprotocol VRF vrf1 and configures an IPv4 address family.

```
Orion_B54Q(config)#vrf definition vrf1
Orion_B54Q(config-vrf)#address-family ipv4
Orion_B54Q(config-vrf-af)# exit-address-family
Orion_B54Q(config-vrf)#
```

Related Commands	Command	Description
	address-family	Configures an IPv4 address family or IPv6 address family for a multiprotocol VRF.
	vrf definition	Defines a multiprotocol VRF.

Platform N/A
Description

10.4 ip vrf

Use this command to create a VRF. Use the **no** form of this command to delete a VRF.

ip vrf *vrf-name*
no ip vrf *vrf-name*

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name

Defaults No VRF is configured by default.

Command mode Global configuration mode

Usage Guide N/A

Configuration Examples The following example creates a VRF.

```
Orion_B54Q(config)# ip vrf redvrf
Orion_B54Q(config-vrf)#
```

Related Commands	Command	Description
	N/A	N/A

Platform N/A
Description

10.5 ip vrf forwarding

Use this command to add an interface or sub-interface to a VRF. Use the **no** form of this command to quit the VRF.

ip vrf forwarding *vrf-name*
no ip vrf forwarding *vrf-name*

Parameter	Parameter	Description
------------------	-----------	-------------

Description		
	<i>vrf-name</i>	Name of the VRF that the interface or sub-interface joins
Defaults	By default, the interface does not belong to any VRF.	
Command mode	Interface configuration mode	
Usage Guide	You can bind the interface to the uni-protocol IPv4 VRF without the IPv6 enabled on the interface. On the device supporting the VRF, if the interface is bound to the uni-protocol IPv4 VRF with the IPv6 protocol enabled, the device cannot forward the IPv6 packets received on this interface.	
Configuration Examples	The following example adds an interface or sub-interface to a VRF.	
	<pre>Orion_B54Q(config-if-GigabitEthernet 0/0)# ip vrf forwarding redvrf</pre>	
Related Commands	Command	Description
	N/A	N/A
Platform Description	N/A	

10.6 ip vrf receive

Use this command to import the host and direct-connected route of one interface into the specified VRF routing table. Use the **no** form of this command to remove the imported host and direct-connected route from the VRF.

ip vrf receive *vrf-name*

no ip vrf receive *vrf-name*

Parameter Description	Parameter	Description
	<i>vrf-name</i>	Name of the VRF that the host and direct-connected route imported to.

Defaults	By default, the host and direct-connected route of the interface are not imported to other VRFs
Command mode	Interface configuration mode
Usage Guide	Currently, the ip vrf receive command supports the VRF routing based on the PBR. This command is used to import the host with the main and slave addresses and direct-connected route of this interface into the specified VRF routing table. You need to execute this command multiple times to import this host and direct-connected route to multiple VRF routing tables. Unlike the ip vrf forwarding command, which does not bind the interface to the VRF and this interface still belongs to the global VRF. Configuring both ip vrf forwarding and ip vrf receive on an interface is not

allowed. If one has been configured, configuring the other one will prompt an error message.

If **ip vrf forwarding** has been configured, configuring **ip vrf receive** will prompt:

```
% Cannot configure 'ip vrf receive' if interface is under a VRF
```

If **ip vrf receive** has been configured, configuring **ip vrf forwarding** will prompt:

```
% Cannot bind interface to a VRF if it has configed 'ip vrf receive'
```

Configuration Examples

The following example imports the host and direct-connected route of one interface into the specified VRF routing table.

```
Orion_B54Q(config)# interface FastEthernet0/1
Orion_B54Q(config-if)# ip address 192.168.1.2 255.255.255.0
Orion_B54Q(config-if)# ip policy route-map PBR-VRF-SELECTION
Orion_B54Q(config-if)# ip vrf receive VRF_1
Orion_B54Q(config-if)# ip vrf receive VRF_2
Orion_B54Q(config-if)# end
```

Related Commands

Command	Description
ip vrf forwarding	Adds the interface to a VRF.
ip vrf	Creates a VRF.
set vrf	Sets the VRF in the routing map configuration mode.

Platform N/A
Description

10.7 maximum routes

Use this command to set the maximum routes limit within the VRF. Use the **no** form of this command to remove the setting.

maximum routes *limit* { *warn-threshold* | **warning-only** }

no maximum routes

Parameter Description

Parameter	Description
<i>limit</i>	The maximum number of routes, in the range from 1 to 4,294,967,295. The routes which exceed the limits will not be added to the core routing table.
<i>warn-threshold</i>	The warning will be printed when the threshold is reached. The threshold value is in the range from 1 to 100.
warning-only	After the number of routes reaches <i>limit</i> , the warning will be printed but the routes will be added to the core routing table.

Defaults	N/A				
Command Mode	Single-protocol VRF is configured in VRF configuration mode; multiple-protocol VRF is configured in address family mode.				
Usage Guide	This command is used to set the maximum number of routes for the VRF.				
Configuration Examples	<p>The following example sets the maximum number of routes for vrf1 to 1,000, and enables the device to only print the warning.</p> <pre>Orion_B54Q(config)# ip vrf vrf1 Orion_B54Q(config-vrf)# maximum routes 1000 warning-only</pre>				
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td>N/A</td> </tr> </tbody> </table>	Command	Description	N/A	N/A
Command	Description				
N/A	N/A				
Platform Description	N/A				

10.8 vrf definition

Use this command to create the multiprotocol VRF.

vrf definition *vrf-name*

Parameter Description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>vrf-name</i></td> <td>VRF name, no more than 31 characters.</td> </tr> </tbody> </table>	Parameter	Description	<i>vrf-name</i>	VRF name, no more than 31 characters.				
Parameter	Description								
<i>vrf-name</i>	VRF name, no more than 31 characters.								
Defaults	N/A								
Command mode	Global configuration mode								
Usage Guide	The single-protocol VRF configuration command ip vrf cannot be used to edit a multiprotocol VRF; the multiprotocol VRF configuration command vrf definition cannot be used to edit a single-protocol IPv4 VRF.								
Configuration Examples	<p>The following example s creates a multiprotocol VRF <i>vrf1</i>.</p> <pre>Orion_B54Q(config)#vrf definition vrf1 Orion_B54Q(config-vrf)#</pre>								
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>description</td> <td>Configures the description.</td> </tr> <tr> <td>address-family</td> <td>Configures an IPv4 address family or IPv6 address family for a multiprotocol VRF.</td> </tr> <tr> <td>exit-address-family</td> <td>Exits the VRF address family configuration</td> </tr> </tbody> </table>	Command	Description	description	Configures the description.	address-family	Configures an IPv4 address family or IPv6 address family for a multiprotocol VRF.	exit-address-family	Exits the VRF address family configuration
Command	Description								
description	Configures the description.								
address-family	Configures an IPv4 address family or IPv6 address family for a multiprotocol VRF.								
exit-address-family	Exits the VRF address family configuration								

	mode.
vrf forwarding	Binds a network interface to a multiprotocol VRF.

Platform N/A
Description

10.9 vrf forwarding

Use this command to bind a network interface to a multiprotocol VRF.

vrf forwarding *vrf-name*

Parameter Description	Parameter	Description
	<i>vrf-name</i>	VRF name, which shall be a multiprotocol VRF instead of a single-protocol VRF that supports IPv4 only.

Defaults The network interface is not bound to any VRF.

Command mode Interface configuration mode

Usage Guide The configuration command **ip vrf forwarding** cannot be used to bind a network interface to a multiprotocol VRF; the configuration command **vrf forwarding** cannot be used to bind a network interface to a single-protocol IPv4 VRF.

An interface cannot be bound to a multiprotocol VRF that is not configured with any address family. To bind a network interface to a multiprotocol VRF, you should delete the existing IPv4 addresses, VRRP IPv4 addresses, IPv6 addresses and VRRP IPv6 addresses, and disable IPv6 on the interface.

When a network interface is bound to a multiprotocol VRF, no IPv4 address or VRRP IPv4 address should be configured for the interface if no IPv4 address family is configured for the VRF. You should configure an IPv4 address family for the VRF before configuring an IPv4 address and VRRP IPv4 address for the interface.

When a network interface is bound to a multiprotocol VRF, no IPv6 address or VRRP IPv6 address should be configured for the interface if no IPv6 address family is configured for the VRF. You should configure an IPv6 address family for the VRF before configuring an IPv6 address and VRRP IPv6 address for the interface.

If you delete a multiprotocol VRF's IPv4 address family, you should delete the IPv4 addresses and VRRP IPv4 addresses of all network interfaces bound to the VRF, and delete the IPv4 static routes whose routing VRF or next-hop VRF is that VRF. Likewise, if you delete a multiprotocol VRF's IPv6 address family, you should delete the IPv4 addresses and VRRP IPv6 addresses of all network interfaces bound to the VRF, disable IPv6 on the interfaces, and delete the IPv6 static routes whose routing VRF or next-hop VRF is that VRF.

Configuratio The following example binds the interface VLAN 1 to a multiprotocol VRF vrf1.

n Examples

```

Orion_B54Q(config)#vrf definition vrf1
Orion_B54Q(config-vrf)#address-family ipv4
Orion_B54Q(config-vrf-af)#exit-address-family
Orion_B54Q(config-vrf)#address-family ipv6
Orion_B54Q(config-vrf-af)#exit-address-family

Orion_B54Q(config-vrf)#interface vlan 1
Orion_B54Q(config-if)#vrf forwarding vrf1
Orion_B54Q(config-if)#ip address 1.1.1.1 255.255.255.0
Orion_B54Q(config-if)#ipv6 address 1000::1/64
    
```

Related Commands

Command	Description
vrf definition	Defines a multiprotocol VRF.

Platform N/A

Description

10.10 vrf receive

Use this command to add the local host's route and direct route with the interface's IPv4/v6 address to the routing table of the specified VRF.

vrf receive *vrf-name*

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name, which should be a multiprotocol VRF instead of a single-protocol IPv4 VRF.

Defaults N/A

Command mode Interface configuration mode

Usage Guide This command is not used to bind an interface to a VRF, and the interface is still a global interface. If the administrator needs to use PBR to choose VRF, the **vrf receive** command should be configured on the interfaces where PBR is applied for each selected VRF.

When an IPv4 address family is configured for a multiprotocol VRF, the local host's route and direct route with the interface's IPv4 address is added to the IPv4 routing table of the specified VRF, and the local host's route with the IPv4 address of the master VRRP group on the interface is added to the IPv4 routing table of the specified VRF. When an IPv6 address family is configured for a multiprotocol VRF, the local host's route and direct route with the interface's IPv6 address is added to the IPv6 routing table of the specified VRF, and the local host's route with the IPv6 address of the master VRRP group on the interface is added to the IPv6 routing table of the specified VRF.

The **ip vrf forwarding** and **vrf receive** commands are mutually exclusive on an interface, and so are

the vrf forwarding and vrf receive commands. If both commands are configured on an interface, an error message will be shown.

If the **ip vrf forwarding** or **vrf forwarding** command is configured first, and then the **vrf receive** command is configured, the following message will be displayed:

```
% Cannot configure 'vrf receive' if interface is under a VRF
```

If the **vrf receive** command is configured first, and then the **ip vrf forwarding** or **vrf forwarding** command is configured, the following message will be displayed:

```
% Cannot configure 'vrf forwarding vrf2' on this interface, please delete 'ip vrf receive' and 'vrf receive' first.
```

Configuration Examples

The following example selects a VRF using IPv6 PBR on VLAN 1.

```
Orion_B54Q(config)#vrf definition vrf1
Orion_B54Q(config-vrf)#address-family ipv6
Orion_B54Q(config-vrf-af)#exit-address-family

Orion_B54Q(config-vrf)#vrf definition vrf2
Orion_B54Q(config-vrf)#address-family ipv6
Orion_B54Q(config-vrf-af)#exit-address-family

Orion_B54Q(config-vrf)#route-map pbr-vrf-selection permit 10
Orion_B54Q(config-route-map)#match ipv6 address acl1
Orion_B54Q(config-route-map)#set vrf vrf1
Orion_B54Q(config-route-map)#route-map pbr-vrf-selection permit 20
Orion_B54Q(config-route-map)#set vrf vrf2

Orion_B54Q(config-route-map)#interface vlan 1
Orion_B54Q(config-if)#ipv6 policy route-map pbr-vrf-selection
Orion_B54Q(config-if)#ipv6 address 1000::1/64
Orion_B54Q(config-if)#vrf receive vrf1
Orion_B54Q(config-if)#vrf receive vrf2
```

Related Commands

Command	Description
vrf definition	Defines a multiprotocol VRF.
address-family	Configures an IPv4 address family or IPv6 address family for a multiprotocol VRF.
set vrf	Configures a VRF in the route map configuration mode.

Platform Description

N/A

10.11 show ip vrf

Use this command to display the VRF information.

show ip vrf [**brief** | **detail** | **interfaces**] [*vrf-name*]

Parameter Description	Parameter	Description
	brief	(Optional) Displays the VRF information in brief.
	detail	(Optional) Displays the VRF information in detail.
	interfaces	(Optional) Displays the VRF's interface information in detail.
	<i>vrf-name</i>	(Optional) Name of the VRF

Defaults N/A

Command mode Privileged EXEC mode

Usage Guide Use this command to display the VRF information, which can be divided into two levels:
 Use the keyword **brief** to display the information in brief.
 Use the keyword **detail** to display the information in detail.
 Use the keyword **interfaces** to display the VRF's interface information.

Configuration Examples The following example displays the VRF information.

```
Orion_B54Q#show ip vrf
Name                               Interfaces
aaa                                GigabitEthernet 0/0
                                   GigabitEthernet 0/1
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

10.12 show vrf

Use this command to display the VRF configuration (including the single-protocol VRF and the multiple-protocol VRF).

show vrf [**ipv4** | **ipv6** | **brief** | **detail**] [*vrf-name*]

Parameter Description	Parameter	Description
	ipv4	Displays the brief VRF (the single-protocol VRF) information of the IPv4 address family.

ipv6	Displays the VRF brief information of the IPv6 address family.
brief	Displays the brief VRF (including the single-protocol VRF and the multiple-protocol) information.
detail	Displays the detailed VRF (including the single-protocol VRF and the multiple-protocol) information.
<i>vrf-name</i>	VRF name.

Defaults N/A

Command mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays brief information about all VRF.

```
Orion_B54Q#show vrf
  Name          Default RD          Protocols    Interfaces
  ---          -
  aaa           <not set>          ipv4
  aab           <not set>
  bbb           <not set>          ipv6
  ccc           <not set>          ipv4, ipv6   Vl1
```

Field	Description
Name	VRF name.
Default RD	Default RD of the VRF.
Protocol	The address family of the VRF. IPv4 indicates the VRF is enabled in the IPv4 address family mode; ipv6 indicates the VRF is enabled in the IPv6 address family mode.
Interfaces	The interface list of the VRF. The interface where the [ip] vrf forwarding command has been configured will be displayed on that list.

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A