QTECH
МИР ДОСТУПНЕЕ

USER MANUAL

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Chapter 1 COMMANDS FOR ROUTING POLICY

1.1 ip prefix-list description

- **Command: ip prefix-list <*list_name*> description <*description*>**
  - **no ip prefix-list <*list_name*> description**
- **Function:** Configure the description of the prefix-list. The "**no ip prefix-list <*list_name*> description**" command deletes the description contents.
- **Parameter: <*list _name*>** is the name of the prefix-list; **<*description*>** is the description contents.
- **Default:** None.
- **Command Mode:** Global Mode
- **Usage Guide:** This command can be used for explaining and describing a prefix-list, e.g. the application and attention matters of the prefix-list.
- **Example:**
- Switch#config terminal
- Switch(config)#ip prefix-list 3 description This list is used by BGP

1.2 ip prefix-list seq

- **Command: ip prefix-list <*list_name*> [seq <*sequence_number*>] <deny | permit> < any / *ip_addr/mask_length* [ge <*min_prefix_len*>] [le <*max_prefix_len*>]>**
  - **no ip prefix-list <*list_name*> [seq <*sequence_number*>] [<deny | permit> < any / *ip_addr/mask_length* [ge <*min_prefix_len*>] [le <*max_prefix_len*>]>]**
- **Function:** Configure the prefix-list. The "**no ip prefix-list <*list_name*> [seq <*sequence_number*>] [<deny | permit> < any / *ip_addr/mask_length* [ge <*min_prefix_len*>] [le <*max_prefix_len*>]>]**" command deletes the prefix-list.
- **Parameter: <*list _name*>** is the name of prefix-list, "seq" shows the following parameters is the sequence number, **<*sequence_number*>** is the sequence number, "deny" means deny this route, "permit" means permit this route, "any" means adaptive to all packets with any prefix as well as any mask length, ***ip_addr/mask_length*** shows the prefix address (dotted decimal notation) and the length of mask, "ge" means greater than or equal to, **<*min_prefix_len*>** is the minimum length of prefix to be matched (ranging between 0～32), "le" means less than or equal to, **<*max_prefix_len*>** is the maximum length of prefix to be matched (ranging between 0～32).
- **Default:** None.
- **Command Mode:** Global Mode
- **Usage Guide:** A prefix-list is identified by a prefix-list name. Each prefix-list may include several items each of which independently specifies a matching scope of network prefix-list type which is identified with a *sequence-number. sequence-number* specifies

the sequence of matching check in the prefix-list. In the matching process the switch check in turn every items identified by "*sequence-number*" ascending. Once certain item obtains the conditions then the prefix-list filter is passed (without proceeding into the next item check).

- Attentions should be paid on that at least one item match mode should be "permit" when more than one prefix-list items is defined. The deny mode items can be previously defined so to remove the unsuitable routing messages fast. However if all items are at deny mode then none of the routes would be able to pass the filter of this prefix-list. We here can define a "permit 0.0.0.0/0 ge 0 le 32" item after several defined "deny mode" items so to grant the passage for all other routing messages.
- **Example:**
- Switch#config terminal
- Switch(config)#ip prefix-list mylist seq 12345 deny 10.0.0.0/8 le 22 ge 14

1.3 ip prefix-list sequence-number

- **Command: ip prefix-list sequence-number**
  - **no ip prefix-list sequence-number**
- **Function:** Enable the sequence-number auto-creation function, the "**no ip prefix-list sequence-number**" command closes the prefix-list sequence-number.
- **Parameter:** None.
- **Default:** Sequence-number auto-creation enabled.
- **Command Mode:** Global Mode
- **Usage Guide:** The command can be used to close the prefix-list sequence-number.
- **Example:**
- Switch(config)#no ip prefix-list sequence-number

1.4 match as-path

- **Command: match as-path *<list-name>***
  - **no match as-path [*<list-name>*]**
- **Function:** Configure the AS path domain for matching the BGP routing messages. The "**no match as-path [*<list-name>*]**" deletes this configuration.
- **Parameter: <*list-name* >** is the name of access-list.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches the AS path domain of the BGP routing message following the rules specified in the as-path list. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match as-path 60

1.5 match community

- **Command: match community <*community-list-name* | *community-list-num*> [exact-match]**
  - **no match community [<*community-list-name* | *community-list-num*> [exact-match]]**
- **Function:** Configure the community attributes of BGP routing messages. The "**no match community [<*community-list-name* | *community-list-num* > [exact-match]]**" command deletes this configuration.
- **Parameter: <*community-list-name* >** is the name of the community-list, **<*community-list-num* >** is the community-list sequence number, ranging between 1～99 (Standard ACL) or 100～199 (Extended ACL), **[exact-match]** means precise matching.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches the community attributes of the BGP routing message following the rules specified in the community list. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match community 100 exact-match

1.6 match interface

- **Command: match interface <*interface-name* >**
  - **no match interface [<*interface-name* >]**
- **Function:** Configure to match the interfaces. The "**no match interface [<*interface-name* >]**" deletes this configuration.
- **Parameter:** "**<*interface-name* >**" is the name of the interface.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to the next-hop messages in the route. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed. This command is only used in RIP and OSPF protocols.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match interface vlan1

1.7 match ip

- **Command: match ip <address | next-hop> <*ip-acl -name* | *ip-acl -num* | prefix-list *list-name*>**

- **no match ip <address | next-hop> [<*ip-acl -name* | *ip-acl -num* | prefix-list *list-name*>]**

- **Function:** Configure the routing prefix or next-hop. The "**no match ip <*address | next-hop*> [<*ip-acl -name* | *ip-acl -num* | prefix-list *list-name*>]**" deletes this configuration.
- **Parameter: <address >** means matching the routing prefix, **<next-hop>**means matching the routing next-hop, **<*ip-acl -name* >** is the name of ip access-list, **<*ip-acl -num* >** is the ip access-list sequence number, ranging between 1～199 or 1300～2699 (extension scope), **prefix-list** means the matching should follow the prefix-list rules, ***list-name*** is the name of prefix-list.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to the next-hop messages or routing prefix in the route. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match ip address prefix-list mylist

1.8 match ipv6 address

- **Command: match ipv6 address <*ipv6-acl-name | prefix-list list-name*>**
  - **no match ipv6 address [<*ipv6-acl-name | prefix-list list-name*>]**
- **Function:** Configure the prefix for ipv6 routing. If the no form command is enaled, the configuration will be removed.
- **Parameters: address** is the routing prefix to be matched. **<ipv6-acl-name>** is the name of ipv6 access list. Or when the **prefix-list** is configured. **list-name** will be the list name to be matched.
- **Command Mode:** route map mode
- **Usage Guide:** When this command is enabled, the prefix-list in the routing table will be used for routing decision. And if matched, the permit deny operation in the route map will be executed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match ipv6 address prefix-list mylist

1.9 match ipv6 next-hop

- **Command: match ipv6 next-hop <*ipv6-address*>**
  - **no match ipv6 next-hop [<*ipv6-address*>]**
- **Function:** Configure the next hop for ipv6 routing. The no form command will disable the configuration.

- **Parameters:** next-hop is the next station for routing. ipv6-address is the ipv6 address for the ip address of the interface on the next station.
- **Command Mode:** route map mode
- **Usage Guide:** If this command is configured, packets will be delivered according to the next hop information in the routing table. If matched, the permit or deny operation in the route map will be executed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)# match ipv6 next-hop 2000::1

1.10 match metric

- **Command: match metric <*metric-val* >**
    - **no match metric [<*metric-val* >]**
- **Function:** Match the metric value in the routing message. The "**no match metric [<*metric-val* >]**" deletes the configuration.
- **Parameter: <*metric-val* >** is the metric value, ranging between 0～4294967295.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to metric value in the route. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match metric 60

1.11 match origin

- **Command: match origin <egp | igp | incomplete >**
    - **no match origin <egp | igp | incomplete >**
- **Function:** Configure to matching with the origin of the BGP routing message. The "**no match origin <egp | igp | incomplete >**" deletes the configuration.
- **Parameter: egp** means the route is learnt from the external gateway protocols, **igp** means the route is learnt from the internal gateway protocols, **incomplete** means the route origin is uncertain.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to origin message in the BGP route. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal

- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match origin egp

1.12 match route-type

- **Command: match route-type external <type-1 | type-2 >**
  - **no match route-type external [<type-1 | type-2 >]**
- **Function:** Configure to matching with the route type of OSPF routing message. The "**no match route-type external [<type-1 | type-2 >]**" deletes the configuration.
- **Parameter: type-1** means match with the OSPF type 1 external route, **type-2** means match with the OSPF type 2 external route.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to the type of OSPF routes (OSPF AS-external LSA type is either type 1 or type 2). If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match route-type external type-1

1.13 match tag

- **Command: match tag <*tag-val* >**
  - **no match tag [<*tag-val* >]**
- **Function:** Configure to matching with the tag domain of the OSPF routing message. The "**no match tag [<*tag-val* >]**" deletes this configuration.
- **Parameter: <*tag-val* >** is the tag value, ranging between 0～4294967295.
- **Command Mode:** route-map mode
- **Usage Guide:** This command matches according to the tag value in the OSPF route. If the matching succeeded, then the "permit" or "deny" action in the route-map is performed.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match tag 60

1.14 route-map

- **Command: route-map <*map_name*> {deny | permit} <*sequence_num*>**
  - **no route-map <*map_name*> [{deny | permit} <*sequence_num*>]**
- **Function:** Configure the route-map and entering the route-map mode. The "**no route-map <*map_name*> [{deny | permit} <*sequence_num*>]**" command deletes route-map.

- **Parameter:** ***<map_name>*** is the name of route-map, **permit** sets route-map matching mode to permit mode, **deny** sets route-map matching mode to permit mode (**set** sub will not be executed under this mode), ***<sequence_num>*** is the route-map sequence number, ranging between 1～65535.
- **Default:** None
- **Command Mode:** Global Mode
- **Usage Guide:** A route-map may consist of several nodes each of which is a check unit. The check sequence among nodes is identified by *sequence-number*. "permit" means the node filter will be passed if all match subs are obtained by current route and then further all the set sub of this node will be executed without entering the check in the next node; if the match subs can not be met, the proceed to the check in next node. Relation among different node should be "or", namely one node check passed then the route filter is passed when the switch checks each node in turn in the route-map.
- Attentions should be paid on that at least one node match mode should be "permit" when more than one node is defined. When a route-map is used for filtering routing messages, if certain routing message can not pass any node check, then it is considered denied by the route-map. If all nodes in the route-map are set to deny mode, then all routing message should not be able to pass that route-map.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#match as-path 60
- Switch(config-route-map)#set weight 30

1.15 set aggregator

- **Command: set aggregator as *<as-number> <ip_addr>***
  - **no set aggregator as [*<as-number> <ip_addr>*]**
- **Function:** Assign an AS number for BGP aggregator. The "**no set aggregator as [*<as-number> <ip_addr>*]**" deletes this configuration.
- **Parameter:** ***<as-number >*** is the AS number, ***<ip_addr>*** is the ip address of the aggregator shown in decimal notation.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set aggregator as 200 10.1.1.1

1.16 set as-path

- **Command: set as-path prepend <*as-num*>**

- **no set as-path prepend [<*as-num*>]**

- **Function:** Add AS numbers in the AS path domain of the BGP routing message. The "**no set as-path prepend [<*as-num*>]**" command deletes this configuration.
- **Parameter: <*as-num* >** is the AS number, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100), circulating inputting several numbers is available.
- **Command Mode:** route-map mode
- **Usage Guide:** To add AS number in the AS domain of the BGP, the AS path length should be lengthened so to affect the best neighbor path option. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set as-path prepend 200 100.100

1.17 set atomic-aggregate

- **Command: set atomic-aggregate**
  - **no set atomic-aggregate**
- **Function:** Configure the atomic aggregate attributes. The "**no set atomic-aggregate**" command deletes this configuration.
- **Parameter:** None
- **Command Mode:** route-map mode
- **Usage Guide:** The BGP informs other BGP speaker by the atomic aggregate attributes. Local system selects a sub-specified route other than the more specified routes included in it. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set atomic-aggregate

1.18 set comm-list

- **Command: set comm-list <*community-list-name* | *community-list-num* > delete**
  - **no set comm-list <*community-list-name* | *community-list-num* > delete**
- **Function:** Configure to delete the community attributes from the inbound or outbound routing messages. The "**no set comm-list <*community-list-name* | *community-list-num* > delete**" command deletes the configuration.
- **Parameter: <*community-list-name* >** is the name of community list, **<*community-list-num* >** is the sequence number of community list, ranging between 1～99 (standard community list) or 100～199 (extended community list).
- **Command Mode:** route-map mode

- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set comm-list 100 delete

1.19 set community

- **Command: set community [*AA:NN*] [internet] [local-AS] [no-advertise] [no-export] [none] [additive]**
    - **no set community [*AA:NN*] [internet] [local-AS] [no-advertise] [no-export] [none] [additive]**
- **Function:** Configure the community attributes of the BGP routing message. The "**no set community [*AA:NN*] [internet] [local-AS] [no-advertise] [no-export] [none] [additive]**" command deletes this configuration.
- **Parameter: [*AA:NN*]** is the community attribute value, **[internet]** is the internet scope, **[local-AS]** means this route do not announce outside the local AS (but can announce among the sub AS within the confederation), **[no-advertise]** means this route do not send to any neighbor, **[no-export]** means this route do not send to EBGP neighbors, **[none]** means delete the community attributes from the prefix of this route, **[additive]** means add following existing community attributes.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set community local-as additive

1.20 set extcommunity

- **Command: set extcommunity <rt | soo> <*AA:NN*>**
    - **no set extcommunity <rt | soo> [<*AA:NN*>]**
- **Function:** Configure the extended community attributes of the BGP routing message. The "**no set extcommunity <rt | soo> [<*AA:NN*>]**" command deletes this configuration.
- **Parameter: <*rt*>** is the route target, **<*soo*>** is the site of origin, **<*AA:NN*>** is the value of community attributes, amongst AA is AS number, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100), NN is a random two byte number.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.
- **Example:** Set rt as 100:10
- Switch#config terminal
- Switch(config)#route-map r1 permit 5

- Switch(config-route-map)#set extcommunity rt 100:10

- Set soo as 200.200:10
- Switch(config)#route-map r1 permit 10
- Switch(config-route-map)#set extcommunity soo 200.200:10

1.21 set ip next-hop

- **Command: set ip next-hop *<ip_addr>***
  - **no set ip next-hop [*<ip_addr>*]**
- **Function:** Configure the next-hop of the route. The "**no set ip next-hop [*<ip_addr>*]**" command deletes the configuration.
- **Parameter: *<ip_addr >*** is the ip address of next-hop shown with dotted decimal notation.
- **Command Mode:** route-map mode
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set ip next-hop 10.2.2.2

1.22 set local-preference

- **Command: set local-preference *<pre_val>***
  - **no set local-preference [*<pre_val>*]**
- **Function:** Configure the local priority of BGP route. The "**no set local-preference [*<pre_val>*]**" command deletes this configuration.
- **Parameter: *<pre_val >*** is the value of local priority, ranging between 0～4294967295.
- **Command Mode:** route-map mode
- **Usage Guide:** The local priority attribute is the priority level of a route. A route with a higher local priority level when compared with other route of the same destination, will be more preferred than other route. The local priority validates only within this AS and will not be transported to EBGP neighbors. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set local-preference 60

1.23 set metric

- **Command: set metric *< metric_val>***

- **no set metric [< *metric_val*>]**

- **Function:** Configure the metric value of the route. The "**no set metric [< *metric_val*>]**" command deletes the configuration.
- **Parameter: <*metric_val* >** is the metric value, ranging between 1～4294967295.
- **Command Mode:** route-map mode
- **Usage Guide:** The metric value only affects the path option from external neighbors to local AS. The less the metric value is the higher is the priority. Under normal circumstances only the path metric value of the neighbors of the same AS will be compared. To extend the comparison to the metric values of different neighbor path, the bgp always-compare-med command should be configured. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set metric 60

1.24 set metric-type

- **Command: set metric-type <type-1 | type-2>**
  - **no set metric-type [<type-1 | type-2>]**
- **Function:** Configure the metric type of the OSPF routing message. The "**no set metric-type [<type-1 | type-2>]**" command deletes this configuration.
- **Parameter: type-1** means matches the OSPF type 1 external route; **type-2** means matches the OSPF type 2 external route.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set metric-type type-1

1.25 set origin

- **Command: set origin <egp | igp | incomplete >**
  - **no set origin [<egp | igp | incomplete >]**
- **Function:** Configure the origin code of the BGP routing message. The "**no set origin [<egp | igp | incomplete >]**" command deletes this configuration.
- **Parameter: egp** means the route is learnt from the external gateway protocols, **igp** means the route is learnt from the internal gateway protocols, **incomplete** means the route origin is uncertain.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.

- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set origin egp

1.26 set originator-id

- **Command: set originator-id *<ip_addr>***
  - **no set originator-id [*<ip_addr>*]**
- **Function:** Configure the origin ip address of the BGP routing message. The "**no set originator-id [*<ip_addr>*]**" command deletes the configuration.
- **Parameter: *<ip_addr>*** is the ip address of the route source shown by dotted decimal notation.
- **Command Mode:** route-map mode
- **Usage Guide:** To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set originator-id 10.1.1.1

1.27 set tag

- **Command: set tag *<tag_val>***
  - **no set tag [*<tag_val>*]**
- **Function:** Configure the tag domain of OSPF routing messages. The "**no set tag [*<tag_val>*]**" command deletes this configuration.
- **Parameter: *<tag-val >*** is the tag value, ranging between 0～4294967295.
- **Command Mode:** route-map mode
- **Usage Guide:** There is a route-tag domain at the AS-external-LSA type LSA. The domain is normally identified by other routing protocols. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set tag 60

1.28 set vpnv4 next-hop

- This command is not supported by the switch.

1.29 set weight

- **Command: set weight *<weight_val>***
  - **no set weight [*<weight_val>*]**
- **Function:** Configure the weight value of BGP routing message. The "**no set weight [*<weight_val>*]**" command deletes this configuration.
- **Parameter: *<weight_val>*** is weight value, ranging between 0～4294967295
- **Command Mode:** route-map mode
- **Usage Guide:** Weight value is adopted to facilitate the best path option and validates only within the local switch. While there are several route to the same destination the one with higher priority is more preferred. To use this command, one match clause should at first be defined.
- **Example:**
- Switch#config terminal
- Switch(config)#route-map r1 permit 5
- Switch(config-route-map)#set weight 60

1.30 show ip prefix-list <list-name>

- **Command: show ip prefix-list [*<list-name>* [*<ip_addr/len>* [first-match | longer] | seq *<sequence-number>*]]**
- **Function:** Show by prefix-list names.
- **Parameter: *<list-name>*** is the name of prefix-list, ***<ip_addr/len>*** is the prefix ip address and the length of mask, **first-match** stands for the first route table matched with specified ip address, **longer** means longer prefix is required, **seq** means show by sequence number, ***<sequence-number>*** is the sequence number, ranging between 0～4294967295.
- **Default:** None
- **Command Mode:** Admin mode
- **Usage Guide:** All prefix-list will be listed when no prefix-list name is specified.
- **Example:**
- Switch#show ip prefix-list
- ip prefix-list 1: 1 entries
- deny any
- ip prefix-list mylist: 1 entries
- deny 1.1.1.1/8
- Switch#show ip prefix-list mylist 1.1.1.1/8
- seq 5 deny 1.1.1.1/8 (hit count: 0, recount: 0)

Displayed information	Explanation

ip prefix-list mylist: 1 entries	Show a prefix-list named mylist which includes 1 instance.
seq 5 deny 1.1.1.1/8 (hit count: 0, recount: 0)	Show the prefix-list contents sequence numbered 5. hit count: 0 means being hit 0 time, recount: 0 means referred 0 time.

1.31 show ip prefix-list <detail | summary>

- **Command: show ip prefix-list [<detail | summary> [<*list-name*>]]**
- **Function:** Display the contents of the prefix list.
- **Parameters:** When **detail** is enabled, detail of prefix-list will be displayed. For **summary**, it is similar but a summary will be displayed. **<*list-name*>** is the name of the prefix list.
- **Default:** None.
- **Command Mode:** Privileged mode and configuration mode
- **Usage Guide:** If no prefix list name is specified, all the prefix list will be displayed.
- **Example:**
- Switch#show ip prefix-list detail mylist
- ip prefix-list mylist:
- count: 2, range entries: 0, sequences: 5 - 10
- seq 5 deny 1.1.1.1/8 (hit count: 0, refcount: 0)
- seq 10 permit 2.2.2.2/8 (hit count: 0, refcount: 0)
- Switch#show ip prefix-list summary mylist
- ip prefix-list mylist:
- count: 2, range entries: 0, sequences: 5 – 10

Displayed information	**Explanation**
ip prefix-list mylist:	To display the prefix list which named mylist.
count: 2, range entries: 0, sequences: 5 - 10	count : 2 means there are two prefix list instances. sequences: 5-10 means the sequence number. 5 is the starting sequence number, while 10 is the ending.
deny 1.1.1.1/8 (hit count: 0, refcount: 0)	deny 1.1.1.1/8 is contents of the prefix

	list. hit count:0 means the rule has been matched for zero times. And refcount:0 means the rule is referenced for zero times.

1.32 show route-map

- **Command: show route-map**
- **Function:** Show the content of route-map.
- **Parameter:** None
- **Default:** None
- **Command Mode:** Admin mode
- **Usage Guide:** None
- **Example:**
- Switch# show route-map
- route-map a, deny, sequence 10
- Match clauses:
- as-path 60
- Set clauses:
- metric 10

Displayed information	Explanation
route-map a, deny, sequence 10	route-map a means the name of route map is a, deny means the deny mode, sequence 10 means the sequence number is 10
Match clauses:	Match sub
as-path 60	Detailed contents in the Match sub
Set clauses:	Set sub
metric 10	Detailed content in the Set clause

1.33 show router-id

- **Command: show router-id**
- **Function:** Show the content of router-id.
- **Default:** None
- **Command Mode:** Admin and Configuration Mode
- **Example:**
- 1:
- Switch#show router-id Router ID: 20.1.1.1 (automatic) 2:
- Switch#show router-id Router ID: 20.1.1.2 (config)

Chapter 2 COMMANDS FOR STATIC ROUTE

2.1 ip route

- **Command: ip route {*<ip-prefix>* *<mask>* | *<ip-prefix>/<prefix-length>*} {*<gateway-address>* | *<gateway-interface>*} [*<distance>*]**
  - **no ip route {*<ip-prefix>* *<mask>* | *<ip-prefix>/<prefix-length>*} [*<gateway-address>* | *<gateway-interface>*] [*<distance>*]**
- **Function:** Configure the static route. The "**no ip route {*<ip-prefix>* *<mask>* | *<ip-prefix>/<prefix-length>*} [*<gateway-address>* | *<gateway-interface>*] [*<distance>*]**" command deletes the static route.
- **Parameter:** The ***<ip-prefix>*** and ***<mask>*** are respectively destination IP address and subnet mask, shown in dotted decimal notation; ***<ip-prefix>*** and ***<prefix-length>*** are respectively the destination IP address and the length of prefix; ***<gateway-address>*** is the next-hop IP address shown in dotted decimal notation; ***<gateway-interface>*** is the next-hop interface, ***< distance >*** is the manage distance of route management, ranging between 1～255.
- **Default:** The management distance of static routing is defaulted at 1.
- **Command Mode:** Global Mode.
- **Usage Guide:** When configuring the next-hop of static routing, both by specifying the next-hop IP address of the route data packet and the exit interface are available.
- The default distance values of each route type in the layer 3 switch of our company are listed below:

Route Type	Distance Value
Direct Route	0
Static Route	1
OSPF	110
RIP	120
IBGP	200
EBGP	20

- The direct route has the highest priority when each route management distance value remain unchanged and followed by static route, EBGP, OSPF, RIP, IBGP.
- **Example:**
- Example 1. Add a static route

- Switch(config)#ip route 1.1.1.0 255.255.255.0 2.1.1.1
- Example 2. Add default route
- Switch(config)#ip route 0.0.0.0 0.0.0.0 2.2.2.1

2.2 ip route vrf

This command is supported by this switch.

2.3 show ip route

- **Command: show ip route [<*destination*>|<*destination* >|<*length*>|connected | static | rip| ospf | bgp | isis| kernel| statistics| database [connected | static | rip| ospf | bgp | isis| kernel] |fib[statistics]]**
- **Function:** Show the route table.
- **Parameter: <*destination*>** is the destination network address; **<*destination* >/<*length*>** is the destination network address plus the length of prefix; **connected** is direct route; **static** is static route; **rip** is RIP route; **ospf** is OSPF route; **bgp** is BGP route; **isis** is ISIS route; **kernel** is kernel route; **statistics** shows the number of routes; **database** is route database; **fib** is kernel route table.
- **Command Mode:** All modes
- **Usage Guide:** Show all the contents in the route table including: route type, destination network, mask, next-hop address, interface, etc
- **Example:** switch#show ip route
- Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
- - 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
- i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
- - candidate default
- Gateway of last resort is 210.0.0.3 to network 0.0.0.0
- S* 0.0.0.0/0 [1/0] via 210.0.0.3, Vlan1
  C 127.0.0.0/8 is directly connected, Loopback
  O IA 172.16.11.0/24 [110/40] via 210.14.0.1, Vlan3014, 00:00:47
  O IA 172.16.12.0/24 [110/40] via 210.14.0.1, Vlan3014, 00:00:47
  O IA 172.16.13.0/24 [110/40] via 210.14.0.1, Vlan3014, 00:00:47
  O IA 172.16.14.0/24 [110/40] via 210.14.0.1, Vlan3014, 00:00:47
  O IA 172.16.15.0/24 [110/50] via 210.14.0.1, Vlan3014, 00:00:47
  O E2 172.16.100.0/24 [110/0] via 210.14.0.1, Vlan3014, 00:00:46

Displayed information	Explanation
C –connected	Direct route, namely the segment

	directly connected with the layer 3 switch
S –static	Static route, the route manually configured by users
R - RIP derived	RIP route, acquired by layer 3 switch through the RIP protocol.
O - OSPF derived	OSPF route, acquired by layer 3 switch through the OSPF protocol
A- OSPF ASE	Route introduced by OSPF
B- BGP derived	BGP route, acquired by the BGP protocol.
Destination	Target network
Mask	Target network mask
Nexthop	Next-hop IP address
Interface	Next-hop pass-by layer 3 swtich interfaces
Preference	Route priority. If other types of route to the target network exists, the kernel route will only shows those with high priority.

2.4 show ip route vrf

This command is not supported by this switch.

2.5 show ip route fib

This command is not supported by the switch.

Chapter 3 COMMANDS FOR RIP

3.1 accept-lifetime

- **Command: accept-lifetime <*start-time*> {<*end-time*>| duration<*seconds*>| infinite}**
- **no accept-lifetime**
- **Function:** Use this command to specify a key accept on the key chain as a valid time period. The "**no accept-lifetime**" command deletes this configuration.
- **Parameter: <*start-time*>** parameter specifies the start time of the time period, of which the form should be:
    - ***<start-time>={<hh:mm:ss> <month> <day> <year>|<hh:mm:ss> <day> <month> <year>}***
    - ***<hh:mm:ss>*** specify the concrete valid time of **accept-lifetime** in hours, minutes and second
    - ***<day>*** specifies the date of valid, ranging between 1 -31
    - ***<month>*** specifies the month of valid shown with the first three letters of the month, such as Jan
    - ***<year>*** specifies the year of valid start, ranging between 1993 - 2035
    - ***<end-time>*** specifies the due of the time period, of which the form should be:
    - ***<end-time>={<hh:mm:ss> <month> <day> <year>|<hh:mm:ss> <day> <month> <year>}***
    - ***<hh:mm:ss>*** specify the concrete valid time of **accept-lifetime** in hours, minutes and second
    - ***<day>*** specifies the date of valid, ranging between 1 -31
    - ***<month>*** specifies the month of valid shown with the first three letters of the month, such as Jan
    - ***<year>*** specifies the year of valid start, ranging between 1993 - 2035
    - ***<seconds>*** the valid period of the key in seconds, ranging between 1-2147483646
    - **Infinite** means the key will never be out of date.
- **Default:** No default configuration.
- **Command Mode:** keychain-key mode
- **Usage Guide:** None.
- **Example:** The example below shows the accept-lifetime configuration of key 1 on the keychain named mychain.
- Switch# config terminal
- Switch(config)# key chain mychain
- Switch(config-keychain)# key 1
- Switch(config-keychain-key)# accept-lifetime 03:03:01 Dec 3 2004 04:04:02 Oct 6 2006
- **Related Command:**
- **key**

- **key-string**
- **key chain**
- **send-lifetime**

3.2 address-family ipv4

- This command is supported by this switch.

3.3 clear ip rip route

- Command: clear ip rip route {*<A.B.C.D/M>* | kernel | static | connected | rip | ospf | isis | bgp | all}
- **Function:** Clear specific route in the RIP route table.
- **Parameter:** ***<A.B.C.D/M>*** Clear the routes which match the destination address from the RIP route table. Specifies the IP address prefix and its length of the destination address
- **kernel** delete kernel routes from the RIP route table
- **static** delete static routes from the RIP route table
- **connected** delete direct routes from the RIP route table
- **rip** only delete RIP routes from the RIP route table
- **ospf** only delete OSPF routes from the RIP route table
- **isis** only delete ISIS routes from the RIP route table
- **bgp** only delete BGP routes from the RIP route table
- **all** delete all routes from the RIP route table
- **Default:** No default configurations.
- Command Mode: Admin mode
- **Usage Guide:** Use this command with the all parameter will delete all learnt route in the RIP route which will be immediately recovered except for rip route. The dynamic learnt RIP route can only be recovered by studying one more time.
- **Example:** Switch# clear ip rip route 10.0.0.0/8
- Switch# clear ip rip route ospf

3.4 debug rip

- Command: debug rip [events| nsm| packet[recv|send][detail]| all]
- no debug rip [events| nsm| packet[recv|send][detail]| all]
- **Function:** Open various RIP adjustment switches and show various adjustment

debugging messages. The "**no debug rip [events| nsm| packet[recv|send][detail]| all]**" command closes corresponding debugging switch.

- **Parameter: events** shows the debugging messages of RIP events
- **nsm** shows the communication messages between RIP and NSM
- **packet** shows the debugging messages of RIP data packets
- **recv** shows the messages of the received data packets
- **send** shows the messages of the sent data packets
- **detail** shows the messages of received or sent data packets
- **Default:** Debug switch closed.
- **Command Mode:** Admin mode and global mode
- **Example:** Switch# debug rip packet
- Switch#1970/01/01 01:01:43 IMI: SEND[Vlan1]: Send to 224.0.0.9:520
- 1970/01/01 01:01:43 IMI: SEND[Vlan1]: Send to 224.0.0.9:520
- 1970/01/01 01:01:47 IMI: RECV[Vlan1]: Receive from 20.1.1.2:520

3.5 debug rip redistribute message send

- Command: debug rip redistribute message send
- no debug rip redistribute message send
- **Function:** To enable the debugging of sending messages for routing redistribution messages from OSPF process or BGP protocol for RIP. The no form of this command will disable the debugging messages.
- Parameter: None.
- **Default:** Close the debug by default.
- Command Mode: Admin Mode.
- Usage Guide: None.
- Example:
- Switch#debug rip redistribute message send
- Switch#no debug rip redistribute message send

3.6 debug rip redistribute route receive

- Command: debug rip redistribute route receive
- no debug rip redistribute route receive
- **Function:** To enable debugging of received messages from NSM for RIP. The no form of this command will disable debugging of received messages from NSM for RIP.

- Parameter: None.
- **Default:** Close the debug by default.
- Command Mode: Admin Mode.
- Usage Guide: None.
- Example:
- Switch#debug rip redistribute route receive
- Switch#no debug rip redistribute route receive

3.7 default-information originate

- Command: default-information originate
- no default-information originate
- **Function:** Allow the network 0.0.0.0 to be redistributed into the RIP. The "**no default-information originate**" disables this function.
- Parameter: None
- Default: Disabled
- **Command Mode:** Router mode and address-family mode
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# default-information originate

3.8 default-metric

- Command: default-metric <*value*>
- no default-metric
- **Function:** Set the default metric value of the introduced route. The "**no default-metric**" command restores the default value to 1.
- **Parameter: <*value*>** is the metric value to be set, ranging between 1~16.
- **Default:** Default route metric value is 1.
- **Command Mode:** Router mode and address-family mode
- **Usage Guide: default-metric** command is used for setting the default route metric value of the routes from other routing protocols when distributed into the RIP routes. When using the **redistribute** commands for introducing routes from other protocols, the default route metric value specified by **default-metric** will be adopted if no specific route metric value is set.
- **Example:** Set the default route metric value to 3 for introducing routes from other

routing protocols into the RIP routes.

- Switch(config-router)#default-metric 3
- Relevant Commands: redistribute

3.9 distance

- Command: distance <number> [<A.B.C.D/M>] [<access-list-name | access-list-number >]
- no distance [<*A.B.C.D/M*>]
- **Function:** Set the managing distance with this command. The "**no distance [<*A.B.C.D/M*>]**" command restores the default value to 120.
- **Parameter: <*number*>** specifies the distance value, ranging from 1 to 255. **<*A.B.C.D/M*>** specifies the network prefix and its length. **<*access-list-name | access-list-number* >** specifies the access-list number or name applied.
- **Default:** The default managing distance of RIP is 120.
- **Command Mode:** Router mode and address-family mode
- **Usage Guide:** In case there are routes from two different routing protocols to the same destination, the managing distance is then used for selecting routes. The less the managing distance of the route protocol is, the more reliable will be the route acquired from the protocol.
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# distance 8 10.0.0.0/8 mylist

3.10 distribute-list

- Command: distribute-list {<access-list-number | access-list-name> |prefix<prefix-list-name>} {in|out} [<ifname>]
- no distribute-list {<access-list-number| access-list-name> |prefix<prefix-list-name>} {in|out} [<ifname>]
- **Function:** This command uses access-list or prefix-list to filter the route update packets sent and received. The "**no distribute-list {<*access-list-number*| *access-list-name*> |prefix<*prefix-list-name*>} {in|out} [<*ifname*>]**" command cancels this route filter function.
- **Parameter: <*access-list-number |access-list-name*>** is the name or access-list number to be applied. **<*prefix-list-name*>** is the name of the prefix-list to be applied. **<*ifname*>**

specifies the name of interface to be applied with route filtering.

- **Default:** The function in default situation is disabled.
- **Command Mode:** Router mode and address-family mode
- **Usage Guide:** The filter will be applied to all the interfaces in case no specific interface is set.
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# distribute-list prefix myfilter in vlan 1

3.11 exit-address-family

- Command: exit-address-family
- **Function:** Exit address-family mode
- **Command Mode:** address-family mode
- **Example:** Switch(config)# router rip
- Switch(config-router)# address-family ipv4 vrf IPI
- Switch(config-router-af)# exit-address-family
- Switch(config-router)#

3.12 ip rip aggregate-address

- Command: ip rip aggregate-address A.B.C.D/M
- no ip rip aggregate-address A.B.C.D/M
- **Function:** To configure RIP aggregation route. The no form of this command will delete this configuration.
- **Parameter:** A.B.C.D/M:IPv4 address and mask length.
- **Command Mode:** Router Mode or Interface Configuration Mode.
- **Default:** Disabled.
- **Usage Guide:** If to configure aggregation route under router mode, RIP protocol must be enabled. If configured under interface configuration mode, RIP protocol may not be enabled, but the aggregation router can operation after the RIP protocol be enabled on interface.
- **Example:** To configure aggregation route as 192.168.20.0/22 globally.
- Switch(config)#router rip
- Switch(config-router) #ip rip agg 192.168.20.0/22

3.13 ip rip authentication key-chain

- Command: ip rip authentication key *<name-of-chain>*
- no ip rip authentication key-chain
- **Function:** Use this command to enable RIPV2 authentication on an interface and further configures the adopted key chain. The "**no ip rip authentication key-chain**" command cancels the authentication.
- **Parameter:** ***<name-of-chain>*** is the name of the adopted key chain. There may be spaces in the string. The input ends with an enter and the string should not be longer than 256 bytes.
- **Default:** Not configured.
- **Command Mode:** Interface Configuration Mode.
- **Usage Guide:** If the authentication is only configured without configuring the key chain or password used by the interface, the authentication does no effect. If mode has not been configured prior to configuring this command, the mode will be set to plaintext authentication. The "no ip rip authentication key" command will cancel the authentication which only cancels the authentication process when sending or receiving data packet other than set non authentication mode.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip authentication key my key
- Relevant Commands: key, key chain

3.14 ip rip authentication mode

- Command: ip rip authentication mode {text|md5}
- no ip rip authentication mode {ext|md5}
- **Function:** Configure the authentication mode; the "**no ip rip authentication mode {ext|md5}**" command restores the default authentication mode namely text authentication mode.
- **Parameter: text** means text authentication; **md5** means MD5 authentication.
- **Default:** Not configured authentication.
- **Command Mode:** Interface Configuration Mode.
- **Usage Guide:** RIP-I do not support authentication which the RIP-II supports two authentication modes: text authentication (i.e. Simple authentication) and data packet authentication (i.e. MD5 authentication). This command should be used associating the

ip rip authentication key or ip rip authentication string. Independently configuration will not lead to authentication process.

- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip authentication mode md5
- Related Command: ip rip authentication key-chain, ip rip authentication string

3.15 ip rip authentication string

- Command: ip rip authentication string *<text>*
- no ip rip authentication string
- **Function:** Set the password used in RIP authentication. The "**no ip rip authentication string**" cancels the authentication.
- **Parameter:** ***<text>*** is the password used in authentication of which the length should be 1-16 characters with space available. The password should end with enter.
- **Command Mode:** Interface mode
- **Usage Guide:** The ip rip authentication key will not be able to be configured when this command is configured, key id value is required in MD5 authentication which is 1 when use this command. The mode will be set to plaintext authentication in case no mode configuration is available. The "**no ip rip authentication string**" command will cancel the authentication which only cancels the authentication process when sending or receiving data packet other than set non authentication mode. Input ip rip authentication string aaa aaa to set the password as aaa aaa which is 7 characters.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip authentication string guest
- Related Command: ip rip authentication mode

3.16 ip rip authentication cisco-compatible

- Command: ip rip authentication cisco-compatible
- no ip rip authentication cisco-compatible
- **Function:** After configured this command, the cisco RIP packets will be receivable by configuring the plaintext authentication or MD5 authentication.
- Parameter: None
- **Default:** Not configured

- **Command Mode:** Interface mode
- **Usage Guide:** After authentication is configured on the cisco router, the RIP packets will exceeds the length of the defined standard length of the protocol once the number of route items is greater than 25. By configuring this command the over-lengthen RIP packets will be receivable other than denied.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip authentication cisco-compatible
- Related Command: ip rip authentication mode

3.17 ip rip receive-packet

- Command: ip rip receive-packet
- no ip rip receive-packet
- **Function:** Set the interface to be able to receivable RIP packets; the "**no ip rip receive-packet**" command sets the interface to be unable to receivable RIP packets.
- **Default:** Interface receives RIP packets.
- **Command Mode:** Interface Configuration Mode.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip receive-packet
- Related Command: ip rip send-packet

3.18 ip rip receive version

- Command: ip rip receive version { 1 | 2|1 2 }
- no ip rip receive version
- **Function:** Set the version information of the RIP packets the interface receives. The default version is 2; the "**no ip rip receive version**" command restores the value set by using the version command.
- **Parameter:** 1 and 2 respectively stands for RIP version 1 and RIP version 2, 1 2 stands for the RIP versions 1, 2.
- **Default:** Version 2
- **Command Mode:** Interface Configuration Mode.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1

- Switch(Config-if-Vlan1)# ip rip receive version 1 2
- Related Command: version

3.19 ip rip send-packet

- Command: ip rip send-packet
- no ip rip send-packet
- **Function:** Set the Interface to be able to receive the RIP packets; the "**no ip rip send-packet**" sets the interface to be unable to receive the RIP packets.
- **Default:** Interface sends RIP packets.
- **Command Mode:** Interface Configuration Mode.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip send-packet
- Related Command: ip rip receive-packet

3.20 ip rip send version

- Command: ip rip send version { 1 | 2 | 1-compatible | 1 2}
- no ip rip send version
- **Function:** Set the version information of the RIP packets the interface receives. The default version is 2; the "**no ip rip send version**" command restores the value set by using the version command.
- **Parameter:** 1 and 2 respectively stands for RIP version 1 and RIP version 2, 1 2 stands for the RIP versions 1, 2.
- **Default:** Version 2
- **Command Mode:** Interface Configuration Mode.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip send version 1
- Related Command: version

3.21 ip rip split-horizon

- Command: ip rip split-horizon [poisoned]
- no ip rip split-horizon

- **Function:** Enable split horizon. The "**no ip rip split-horizon**" disables the split horizon.
- **Parameter: [poisoned]** means configure the split horizon with poison reverse.
- **Default:** Split Horizon with poison reverse by default.
- **Command Mode:** Interface Configuration Mode.
- **Usage Guide:** The split horizon is for preventing the Routing Loops, namely preventing the layer 3 switches from broadcasting the routes which is learnt from the same interface on which the route to be broadcasted.
- **Example:** Switch# config terminal
- Switch(config)# interface vlan 1
- Switch(Config-if-Vlan1)# ip rip split-horizon poisoned

3.22 key

- Command: key <*keyid*>
- no key <keyid>
- **Function:** This command is for managing and adding keys in the key chain. The "**no key *<keyid>***" command deletes one key.
- **Parameter: *<keyid>*** is key ID, ranging between 0-2147483647.
- **Command Mode:** Keychain mode and keychain-key mode
- **Usage Guide:** The command permits entering the keychain-key mode and set the passwords corresponding to the keys.
- **Example:** Switch# config terminal
- Switch(config)# key chain mychain
- Switch(config-keychain)# key 1
- Switch(config-keychain-key)#
- Relevant Commands: key chain, key-string, accept-lifetime, send-lifetime

3.23 key chain

- Command: key chain <*name-of-chain*>
- no key chain < name-of-chain >
- **Function:** This command is for entering a keychain manage mode and configure a keychain. The "**no key chain *< name-of-chain >***" deletes one keychain.
- **Parameter: *<name-of-chain>*** is the name string of the keychain the length of which is not specifically limited.
- Command Mode: Global Mode

- **Example:** Switch# config terminal
- Switch(config)# key chain mychain
- Switch(config-keychain)#
- Relevant Commands: key, key-string, accept-lifetime, send-lifetime

3.24 key-string

- Command: key-string *<text>*
- no key-string *<text>*
- **Function:** Configure a password corresponding to a key. The "**no key-string *<text>***" command deletes the corresponding password.
- **Parameter: *<text>*** is a character string without length limit. However when referred by RIP authentication only the first 16 characters will be used.
- **Command Mode:** Keychain-key mode
- **Usage Guide:** This command is for configure different passwords for keys with different ID.
- **Example:** Switch# config terminal
- Switch(config)# key chain mychain
- Switch(config-keychain)# key 1
- Switch(config-keychain-key)# key-string prime
- Related Command: key, key chain, accept-lifetime, send-lifetime

3.25 maximum-prefix

- Command: maximum-prefix <*maximum-prefix*> [<*threshold*>]
- no maximum-prefix
- **Function:** Configure the maximum number of RIP routes in the route table. The "**no maximum-prefix**" command cancels the limit.
- **Parameter: *<maximum-prefix>*** the maximum number of RIP route, ranging between 1-65535; a warning is given when the number rate of current route exceeds ***<threshold>*** ranging between 1-100, default at 75.
- Command Mode: router mode
- **Usage Guide:** The maximum RIP route only limits the number of routes learnt through RIP but not includes direct route or the RIP static route configured by the route command. The base on which the comparison is performed is the number of route marked R in the show ip route database, and also the number of RIP routes displayed in

the show ip route statistics command.

- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# maximum-prefix 150

3.26 neighbor

- Command: neighbor <*A.B.C.D*>
- no neighbor <*A.B.C.D*>
- **Function:** Specify the destination address requires targeted-peer sending. The "**no neighbor <*A.B.C.D*>**" command cancels the specified address and restores all gateways to trustable.
- **Parameter: <*A.B.C.D*>** is the specified destination address for the sending, shown in dotted decimal notation.
- **Default:** Not sending to any targeted-peer destination address.
- Command Mode: Router mode
- **Usage Guide:** When used accompany with passive-interface command it can be configured to only sending routing messages to specific neighbor.
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# neighbor 1.1.1.1
- Related Command: passive-interface

3.27 network

- Command: network <A.B.C.C/M|ifname>
- no network <A.B.C.C/M|ifname>
- **Function:** Configure the RIP protocol network.
- **Parameter: <*A.B.C.C/M*|>** is the IP address prefix and its length in the network.
- **<*ifname*>** is the name of a interface.
- **Default:** Not running RIP protocol
- **Command Mode:** Router mode and address-family mode
- **Usage Guide:** Use this command to configure the network for sending or receiving RIP update packets. If the network is not configured, all interfaces of the network will not be able to send or receive data packets.
- **Example:** Switch# config terminal

- Switch(config)# router rip
- Switch(config-router)# network 10.0.0.0/8
- Switch(config-router)# network vlan 1
- Related Command: show ip rip, clear ip rip

3.28 offset-list

- Command: offset-list <access-list-number |access-list-name> {in|out} <number > [<ifname>]
- no offset-list <access-list-number |access-list-name> {in|out} <number > [<ifname>]
- **Function:** Add an offset value to the metric value of the routes learnt by RIP. The "**no offset-list *<access-list-number |access-list-name>* {in|out} *<number >* [*<ifname>*]**" command disables this function.
- **Parameter:** ***< access-list-number |access-list-name>*** is the access-list or name to be applied. ***<number >*** is the added offset value, ranging between 0-16; ***<ifname>*** is the specific interface name
- **Default:** Default offset value is the metric value defined by the system.
- **Command Mode:** Router mode and address-family mode
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# offset-list 1 in 5 vlan 1
- Related Command: access-list

3.29 passive-interface

- Command: passive-interface *<ifname>*
- no passive-interface *<ifname>*
- **Function:** Set the RIP layer 3 switch blocks RIP broadcast on specified interface, on which the RIP data packets will only be sent to layer 3 switches configured with neighbor.
- **Parameter:** ***<ifname>*** is the name of specific interface.
- **Default:** Not configured
- Command Mode: Router mode
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# passive-interface vlan 1

- Related Command: show ip rip

3.30 recv-buffer-size

- Command: recv-buffer-size<*size*>
- no recv-buffer-size
- **Function:** This command configures the size of UDP receiving buffer zone of RIP; the "**no recv-buffer-size**" command restores the system default.
- **Parameter:** ***<size>*** is the buffer zone size in bytes, ranging between 8192-2147483647.
- **Default:** 8192 bytes.
- Command Mode: Router mode
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# recv-buffer-size 23456789

3.31 redistribute

- Command: redistribute {kernel |connected| static| ospf [<process-id>] | isis| bgp} [metric<*value*>] [route-map<*word*>]
- no redistribute {kernel |connected| static| ospf [<process-id>] | isis| bgp} [metric<*value*>] [route-map<*word*>]
- **Function:** Introduce the routes learnt from other routing protocols into RIP.
- **Parameter: kernel** introduce from kernel routes;
- **connected** introduce from direct routes;
- **static** introduce from static routes;
- **ospf** introduce from OSPF routes. process-id is OSPF process ID, if there is no parameter that means the process by default, range between 1 to 65535;
- **isis** introduce from ISIS routes;
- **bgp** introduce from BGP routes;
- ***<value>*** is the metric value assigned to the introduced route, ranging between 0 to 16;
- ***<word>*** is the probe pointing to the route map for introducing routes.
- **Command Mode:** Router Mode and address-family Mode
- **Usage Guide:** Under the address-family mode, the parameter kernel and ISIS is unavailable.
- Example:
- Switch# config terminal

- Switch(config)# router rip
- Switch(config-router)# redistribute kernel route-map ipi
- To redistribute OSPFv2 routing information to RIP.
- Switch(config)# router rip
- Switch(config-router)# redistribute ospf 2

3.32 redistribute ospf (vrf command)

- This command is not supported by the switch.

3.33 route

- Command: route *<A.B.C.D/M>*
- no route <A.B.C.D/M>
- **Function:** This command configures a static RIP route. The "**no route *<A.B.C.D/M>***" command deletes this route.
- **Parameter:** Specifies this destination IP address prefix and its length.
- Command Mode: Router mode
- **Usage Guide:** The command adds a static RIP route, and is mainly used for debugging. Routes configured by this command will not appear in kernel route table but in the RIP route database.
- **Example:** Switch# config terminal
- Switch(config)# router rip
- Switch(config-router)# route 1.0.0.0/8

3.34 router rip

- Command: router rip
- no router rip
- **Function:** Enable the RIP routing process and enter the RIP mode; the "**no router rip**" command closes the RIP routing protocol.
- **Default:** Not running RIP route.
- Command Mode: Global mode
- **Usage Guide:** This command is the switch for starting the RIP routing protocol which is required to be open before configuring other RIP protocol commands.
- **Example:** Enable the RIP protocol mode

- Switch(config)#router rip
- Switch(config-router)#

3.35 send-lifetime

- Command: send-lifetime <*start-time*> {<*end-time*>| duration<*seconds*>| infinite}
- no send-lifetime
- **Function:** Use this command to specify a key on the keychain as the time period of sending keys. The "**no send-lifetime**" cancels this configuration.
- **Parameter: <*start-time*>** parameter specifies the starting time of the time period, which is:
- <start-time>={<hh:mm:ss> <month> <day> <year>|<hh:mm:ss> <day> <month> <year>}
- ***<hh:mm:ss>*** Specify the concrete valid time of **accept-lifetime** in hours, minutes and second
- ***<day>*** Specifies the date of valid, ranging between 1 -31
- ***<month>*** Specifies the month of valid shown with the first three letters of the month, such as Jan
- ***<year>*** Specifies the year of valid start, ranging between 1993 - 2035
- ***<end-time>*** Specifies the due of the time period, of which the form should be:
- <end-time>={<hh:mm:ss> <month> <day> <year>|<hh:mm:ss> <day> <month> <year>}
- ***<hh:mm:ss>*** Specify the concrete valid time of **accept-lifetime** in hours, minutes and second
- ***<day>*** Specifies the date of valid, ranging between 1 -31
- ***<month>*** Specifies the month of valid shown with the first three letters of the month, such as Jan
- ***<year>*** Specifies the year of valid start, ranging between 1993 -2035
- ***<seconds>*** is the valid period of the key in seconding and ranging between 1-2147483646
- **Default:** No default configuration
- **Command Mode:** Keychain-key mode
- **Usage Guide:** Refer to the 3.13 RIP authentication section.
- **Example:** The example below shows the send-lifetime configuration on the keychain named mychain for key 1.
- Switch# config terminal
- Switch(config)# key chain mychain
- Switch(config-keychain)# key 1

- Switch(config-keychain-key)# send-lifetime 03:03:01 Dec 3 2004 04:04:02 Oct 6 2006
- Related Command: key, key-string, key chain, accept-lifetime

3.36 show debugging rip

- Command: show debugging rip
- **Function:** Show RIP event debugging, RIP packet debugging and RIP nsm debugging status.
- Command Mode: Any mode.
- **Example:** Switch# show debugging rip
- RIP debugging status:
- RIP event debugging is on
- RIP packet detail debugging is on
- RIP NSM debugging is on

3.37 show ip protocols rip

- Command: show ip protocols rip
- **Function:** Show the RIP process parameter and statistics information.
- Command Mode: Any mode.
- Example:
- show ip protocols rip
- Routing Protocol is "rip"
- Sending updates every 30 seconds with +/-50%, next due in 8 seconds
- Timeout after 180 seconds, garbage collect 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: static
- Default version control: send version 2, receive version 2
- Interface Send Recv Key-chain
- Vlan1 2 2
- Routing for Networks:
- Vlan1
- Vlan2
- Routing Information Sources:

- Gateway Distance Last Update Bad Packets Bad Routes
- 20.1.1.1 120 00:00:31 0 0
- Distance: (default is 120)

Displayed information	Explanation
Sending updates every 30 seconds with +/-50%, next due in 8 seconds	Sending update every 30 secs
Timeout after 180 seconds, garbage collect after 120 seconds	The route time-out event period is 180 secs, the garbage collect time is 120 seconds
Outgoing update filter list for all interface is not set	Outgoing update filter list for all interface is not set
Incoming update filter list for all interface is not set	Incoming update filter list for all interface is not set
Default redistribution metric is 1	Default redistribution metric is 1
Redistributing: static	Redistributing the static route into the RIP route
Default version control: send version 2, receive version 2 Interface Send Recv Key-chain Ethernet1/0/3 2 2	The configuration of interface receiving and sending packets. Receive version is 2, keychain 1 not configured.
Routing for Networks: Vlan1 Vlan2	The segment running RIP is the Vlan 1 and Vlan 2
Routing Information Sources: Gateway Distance Last Update Bad Packets Bad Routes 20.1.1.1 120 00:00:31 0 0	Routing information sources The badpacketand bad routes from the gateway 20.1.1.1 are all 0. 31 seconds have passed since

	the last route update. The manage distance is 120
Distance: (default is 120)	Default manage distance is 120

3.38 show ip rip

- Command: show ip rip
- **Function:** Show the routes in the RIP route data base.
- Command Mode: Any mode.
- Example:
- show ip rip
- Codes: R - RIP, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS, B - BGP

- Network Next Hop Metric From If Time
- R 12.1.1.0/24 20.1.1.1 2 20.1.1.1 Vlan1 02:51
- R 20.1.1.0/24 1 Vlan1
- Amongst R stands for RIP route, namely a RIP route with the destination network address 12.1.1.0, the network prefix length as 24, next-hop address at 20.1.1.1. It is learnt from the Ethernet port E1/0/3 with a metric value of 2, and still has 2 minutes 51 seconds before time out.

3.39 show ip rip database

- Command: show ip rip database
- **Function:** Show the routes in the RIP route database.
- Command Mode: Any mode
- **Example:** Switch# show ip rip database
- Codes: R - RIP, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS, B -BGP
- Network Next Hop Metric From If Time
- R 10.1.1.0/24 1 Vlan1
- R 20.1.1.0/24 1 Vlan2

- Command: show ip rip

3.40 show ip rip database vrf

- This command is not supported by the switch.

3.41 show ip rip interface

- Command: show ip rip interface [<*ifname*>]
- **Function:** Show the RIP related messages.
- **Parameter:** ***<ifname>*** is the name of the interface to show the messages.
- Command Mode: Any mode.
- **Example:** Switch# show ip rip interface vlan 1
- Vlan1 is up, line protocol is up
- Routing Protocol: RIP
- Receive RIP packets
- Send RIP packets
- Passive interface: Disabled
- Split horizon: Enabled with Poisoned Reversed
- IP interface address:10.1.1.1/24

3.42 show ip rip interface vrf

- This command is not supported by the switch.

3.43 show ip rip aggregate

- Command: show ip rip aggregate
- **Function:** To display the information of IPv4 aggregation route.
- Parameter: None.
- **Command Mode:** Admin and Configuration Mode.
- Default: None.
- **Usage Guide:** This command is used to display which interface the aggregation route be configured, Metric, Count, Suppress and so on. If configured under global mode, then the interface display "----", "Metric" is metric. "Count" is the number of learned aggregation routes. "Suppress" is the times of aggregation.
- **Example:** To display the information of IPv4 aggregation route.

- Switch(Config-if-Vlan1)#show ip rip agg

- Aggregate information of rip

- Network Aggregated Ifname Metric Count Suppress
- 192.168.0.0/16 Vlan1 1 2 0
- 192.168.4.0/22 ---- 1 2 0
- 192.168.4.0/24 ---- 1 1 1
- Vlan1 1 1 1

Displayed information	Explaination
Network	Route prefix and prefix length.
Aggregated Ifname	To configure the interface name of the aggregation route. If the route aggregated globally, then display “----”.
Metric	Metric of aggregation route.
Count	The number of learned aggregation route.
Suppress	The times of aggregated for aggregation route.

3.44 show ip rip redistribute

- This command is not supported by the switch.

3.45 show ip vrf

- This command is not supported by the switch.

3.46 timers basic

- Command: timers basic <update> <invalid> <garbage>
- no timers basic
- **Function:** Adjust the RIP timer update, timeout, and garbage collecting time. The “**no**

timers basic" command restores each parameter to their default values.

- **Parameter:** ***<update>*** time interval of sending update packet, shown in seconds and ranging between 5-2147483647; ***<invalid>*** time period after which the RIP route is advertised dead, shown in seconds and ranging between 5-2147483647; ***<garbage>*** is the hold time in which the a route remains in the routing table after advertised dead, shown in seconds and ranging between 5-2147483647.
- **Default:** ***<update>*** defaulted at 30; ***<invalid>*** defaulted at 180; ***<garbage>*** defaulted at 120
- Command Mode: Router mode
- **Usage Guide:** The system is defaulted broadcasting RIPng update packets every 30 seconds; and the route is considered invalid after 180 seconds but still exists for another 120 seconds before it is deleted from the routing table.
- **Example:** Set the RIP update time to 20 seconds and the timeout period to 80 second, the garbage collecting time to 60 seconds.
- Switch(Config-Router)#timers basic 20 80 60

3.47 version

- Command: version {1| 2}
- no version
- **Function:** Configure the version of all RIP data packets sent/received by router interfaces: the "**no version**" restores the default configuration.
- **Parameter: 1** is version 1 rip; **2** is version 2 rip.
- **Default:** Sent and received data packet is version 2 by default.
- **Command Mode:** Router mode and address-family mode
- **Usage Guide:** 1 refers to that each interface of the layer 3 switch only sends/receives the RIP-I data packets. 2 refers to that each interface of the layer 3 switch only sends/receives the RIP-II data packets. The RIP-II data packet is the default version.
- **Example:** Configure the version of all RIP data packets sent/received by router interfaces to version 2.
- Switch(config-router)#version 2
- Related Command: ip rip receive version
- ip rip send version

Chapter 4 COMMANDS FOR RIPNG

4.1 clear ipv6 route

- Command: clear ipv6 rip route {*<ipv6-address >*| kernel |static | connected |rip |ospf |isis | bgp |all }
- **Function:** Clear specific route from the RIPng route table.
- **Parameter:** Clears the route exactly match with the destination address from the RIP route table.
- ***<ipv6-address >*** is the destination address shown in hex notation with prefix length.
- **kernel** delete kernel route from the RIPng route table
- **static** delete static route from the RIPng route table
- **connected** delete direct route from the RIPng route table
- **rip** delete RIPng route from the RIPng route table only
- **ospf** delete IPv6 OSPF route from the RIPng route table only
- **bgp** delete IPv6 BGP route from the RIPng route table only
- **ISIS** delete ivp6 isis route from the RIPng route table only
- **all** delete all routes from the RIPng route table
- **Default:** No default configuration
- Command Mode: Admin mode
- **Usage Guide:** All routes in the RIPng route table will be deleted by using this command with all parameters.
- **Example:** Switch#clear ipv6 rip route 2001:1:1::/64
- Switch#clear ipv6 rip route ospf

4.2 default-information originate

- Command: default-information originate
- no default-information originate
- **Function:** Permit redistributing the network 0:: into RIPng. The "**no default-information originate**" disables this function.
- Parameter: None
- **Default:** Disabled
- Command Mode: Router mode
- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip

- Switch(config-router)#default-information originate

4.3 default-metric

- Command: default-metric <*value*>
- no default-metric
- **Function:** Set the default metric route value of the introduced route; the "**no default-metric**" restores the default value.
- **Parameter: <*value*>** is the route metric value to be set, ranging between 1～16.
- **Default:** Default route metric value is 1.
- Command Mode: Router mode
- **Usage Guide: default-metric** command is used for setting the default route metric value of the routes from other routing protocols when distributed into the RIPng routes. When using the **redistribute** commands for introducing routes from other protocols, the default route metric value specified by **default-metric** will be adopted if no specific route metric value is set.
- **Example:** Set the default route metric value of the routes from other routing protocols when distributed into the RIPng routes as 3.
- Switch(config-router)#default-metric 3
- Related Command: redistribute

4.4 distance

- Command: distance <number> [<ipv6-address>] [<access-list-name | access-list-number>]
- no distance [<*ipv6-address*>]
- **Function:** Set the managing distance with this command. The "**no distance [<*A.B.C.D/M*>]**" command restores the default value to 120.
- **Parameter: <*number*>** specifies the distance value, ranging between 1-255. ***<ipv6-address>*** is the local link address or its prefix. ***<access-list-name|access-list-number>*** specifies the access-list number or name applied.
- **Default:** The default managing distance of RIP is 120.
- **Command Mode:** Router mode and address-family mode.
- **Usage Guide:** In case there are routes from two different routing protocols to the same destination, the managing distance is then used for selecting routes. The less the managing distance of the route protocol is, the more reliable will be the route acquired

from the protocol.

- Example:
- Switch#config terminal
- Switch(config)#router rip
- Switch(config-router)#distance 8 fe80:1111::4200:21ff:fe00:11 mylist

4.5 distribute-list

- Command: distribute-list {*access-list-name*> |prefix<*prefix-list-name*>} {in|out} [<*ifname*>|vlan <*vlan-id*>]
- no distribute-list {access-list-name> |prefix<prefix-list-name>} {in|out} [<ifname>|vlan <vlan-id>]
- **Function:** This command uses access-list or prefix-list to filter the route renews messages sent and received. The "**no distribute-list {*access-list-name*> |prefix<*prefix-list-name*>} {in|out} [<*ifname*>|vlan <*vlan-id*>]**" command cancels this filter function.
- **Parameter: <*access-list-name*>** is the name or access-list number to be applied. **<*prefix-list-name*>** is the name of the prefix-list to be applied. **<*ifname*>** specifies the name of interface to be applied with route filtering.
- **Default:** Function disabled by RIPng by default.
- Command Mode: Router mode
- **Usage Guide:** The filter will be applied to all interfaces if no specific interface is set.
- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip
- Switch(config-router)#distribute-list prefix myfilter in Vlan1

4.6 debug ipv6 rip

- Command: debug ipv6 rip [events| nsm| packet [recv|send][detail]| all]
- no debug ipv6 rip [events| nsm| packet [recv|send][detail]| all]
- **Function:** For opening various debugging switches of RIPng, showing various debugging messages. The "**no debug ipv6 rip [events| nsm| packet [recv|send][detail]| all]**" command closes the corresponding debugging switch.
- **Parameter: events** shows the debugging message of RIPng events
- **nsm** shows the communication messages between RIPng and NSM.
- **packet** shows the debugging messages of RIPng data packets
- **recv** shows the messages of the received data packets

- **send** shows the messages of the sent data packets
- **detail** shows the messages of the data packets received or sent.
- **Default:** Not enabled
- Command Mode: Admin mode
- **Example:** Switch#debug ipv6 rip packet
- Switch#1970/01/01 21:15:08 IMI: SEND[Ethernet1/0/4]: Send to [ff02::9]:521
- 1970/01/01 21:15:08 IMI: SEND[Ethernet1/0/2]: Send to [ff02::9]:521
- 1970/01/01 21:15:09 IMI: RECV[Ethernet1/0/4]: Receive from [fe80::20b:46ff:fe57:8e60]:521
- 1970/01/01 21:15:09 IMI: RECV[Ethernet1/0/4]: 3000:1:1::/64 is filtered by access-list dclist
- 1970/01/01 21:15:09 IMI: RECV[Ethernet1/0/4]: 3ffe:1:1::/64 is filtered by access-list dclist
- 1970/01/01 21:15:15 IMI: RECV[Ethernet1/0/2]: Receive from [fe80::203:fff:fe01:257c]:521

4.7 debug ipv6 rip redistribute message send

- Command: debug ipv6 rip redistribute message send
- no debug ipv6 rip redistribute message send
- **Function:** To enable the debugging of sending messages for routing redistribution messages from OSPFv3 or other external process for RIPng. The no form of this command will disable the debugging messages.
- Parameter: None.
- **Default:** Close the debug by default.
- Command Mode: Admin Mode.
- Usage Guide: None.
- Example:
- Switch# debug ipv6 rip redistribute message send
- Switch# no debug ipv6 rip redistribute message send

4.8 debug ipv6 rip redistribute route receive

- Command: debug ipv6 rip redistribute route receive
- no debug ipv6 rip redistribute route receive
- **Function:** To enable the debugging switch received from NSM for redistribution of

routing information for RIPng. The no form of this command will disable the debugging switch.

- Parameter: None.
- **Default:** Close the debug by default.
- Command Mode: Admin Mode.
- Usage Guide: None.
- Example:
- Switch#debug ipv6 rip redistribute route receive
- Switch# no debug ipv6 rip redistribute route receive

4.9 ipv6 rip aggregate-address

- Command: ipv6 rip aggregate-address X:X::X:X/M
- no ipv6 rip aggregate-address X:X::X:X/M
- **Function:** To configure IPv6 aggregation route. The no form of this command deletes the IPv6 aggregation route.
- **Parameter: X:X::X:X/M:** IPv6 address and prefix length.
- **Command Mode:** Router Mode or Interface Configuration Mode.
- **Default:** No aggregation route configured.
- **Usage Guide:** If to configure aggregation route under router mode, RIPng protocol must be enabled. If configured under interface configuration mode, RIPng protocol may not be enabled, but the aggregation route can operation after the RIPng protocol be enabled on interface.
- **Example:** To configure aggregation route as 2001:3f:ed8::99/64 globally.
- Switch(config)#router rip
- Switch(config-router) #ipv6 rip agg 2001:3f:ed8::99/64

4.10 ipv6 rip split-horizon

- Command: ipv6 rip split-horizon [poisoned]
- no ipv6 rip split-horizon
- **Function:** Permit the split horizon. The "**no ipv6 rip split-horizon**" disables the split horizon.
- **Parameter: [poisoned]** configures split horizon with poison reverse.
- **Default:** Split horizon with poison reverse.
- **Command Mode:** Interface Configuration Mode.

- **Usage Guide:** The split horizon is for preventing the routing loops, namely preventing the layer 3 switch from broadcasting a route at the interface from which the very route is learnt. The command can configure on IPv6 tunnel interface, but it is successful configuration to only configure tunnel carefully.
- **Example:** Switch#config terminal
- Switch(config)#interface Vlan1
- Switch(config-if-Vlan1)#ipv6 rip split-horizon poisoned

4.11 ipv6 router rip

- Command: ipv6 router rip
- no ipv6 router rip
- **Function:** Enable RIPng on the interface. The “no ipv6 router rip” command disables RIPng on the interface.
- **Default:** Not configured
- **Command Mode:** Interface Configuration Mode.
- **Usage Guide:** The command can configure on IPv6 tunnel interface, but it is successful configuration to only configure tunnel carefully.
- **Example:** Switch#config terminal
- Switch(config)#interface Vlan1
- Switch(Config-if-Vlan1)#ipv6 router rip

4.12 neighbor

- Command: neighbor <*ipv6-address*> {<*ifname*> vlan <*vlan-id*>}
- no neighbor <ipv6-address> {<ifname> vlan <vlan-id>}
- **Function:** Specify the destination address for fixed sending. The “**no neighbor *<ipv6-address>* *<ifname>* vlan *<vlan-id>***” cancels the specified address defined and restores all trusted gateways.
- **Parameter:** ***<ipv6-address>*** is the IPv6 Link-local address specified for sending and shown in colon hex notation without the prefix length. ***<ifname>*** is the name of interface.
- **Default:** Not sending to any fixed destination address.
- Command Mode: Router mode
- **Usage Guide:** When used associating passive-interface command it would be able to send routing messages to specified neighbor only.

- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip
- Switch(config-router)#neighbor FE80:506::2 Vlan1
- Related Command: passive-interface

4.13 offset-list

- Command: offset-list <access-list-number|access-list-name> {in|out} <number >[<ifname>|vlan <vlan-id>]
- no offset-list <access-list-number|access-list-name> {in|out }<number >[<ifname>|vlan <vlan-id>]
- Function: Add an offset value on the routing metric value learnt by RIPng. The "no offset-list *<access-list-number|access-list-name>* {in|out} *<number >*[*<ifname>*|vlan *<vlan-id>*]" command disables this function.
- **Parameter: *<access-list-number |access-list-name>*** is the access-list or name to be applied. ***<number>*** is the additional offset value, ranging between 0-16; ***<ifname>*** is the name of specific interface.
- **Default:** The default offset value is the metric value of the interface defined by the system.
- Command Mode: Router mode
- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip
- Switch(config-router)#offset-list 1 in 5 Vlan1
- Related Command: access-list

4.14 passive-interface

- Command: passive-interface*<ifname>*|vlan *<vlan-id>*
- no passive-interface*<ifname>*|vlan *<vlan-id>*
- **Function:** Set the RIPng layers 3 switches to block RIPng broadcast on the specified interfaces, and only send the RIPng data packet to the layer 3 switch which is configured with neighbor.
- **Parameter: *<ifname>*** is the specific interface name.
- **Default:** Not configured
- Command Mode: Router mode
- **Example:** Switch#config terminal

- Switch(config)#router ipv6 rip
- Switch(config-router)#passive-interface Vlan1
- Related Command: show ipv6 rip

4.15 redistribute

- Command: redistribute {kernel |connected| static| ospf| isis| bgp} [metric<*value*>] [route-map<*word*>]
- no redistribute {kernel |connected| static| ospf| isis| bgp} [metric<*value*>] [route-map<*word*>]
- **Function:** Introduce the routes learnt from other routing protocols into RIPng.
- **Parameter: kernel** introduce from kernel routes
- **connected** introduce from direct routes
- **static** introduce from static routes
- **ospf** introduce from IPv6 OSPF routes
- **isis** introduce from IPv6 ISIS routes
- **bgp** introduce from IPv6 BGP routes
- **<*value*>** is the metric value assigned to the introduced route, ranging between 0-16
- **<*word*>** is the probe poining to the route map for introducing routes
- Command Mode: Router mode
- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip
- Switch(config-router)#redistribute kernel route-map ip

4.16 redistribute ospf

- Command: redistribute ospf [<*process-tag*>] [metric<*value*>] [route-map<*word*>]
- no redistribute ospf [<*process-tag*>]
- **Function:** To redistribute routing information from external OSPFv3 processes to RIPng process. The no form of this command will remove the introduced OSPFv3 routing entries.
- **Parameters: process-tag** is the string tag for OSPFv3 process with maximum length limited within 15 characters. If not specified, the default process will be used.
- **metric<*value*>** is the metric for the introduced routing entries, limited between 0 and 16.
- **route-map<*word*>** is the pointer to the introduced routing map.

- **Default:** Not redistributed by default.
- **Command Mode:** RIPng Configuration Mode.
- Usage Guide: None.
- **Example:** To redistribute OSPFv3 ABC routing ro RIPng.
- Switch(config)#router ipv6 rip
- Switch (config-router)#redistribute ospf abc

4.17 route

- Command: route <*ipv6-address*>
- no route <ipv6-address>
- **Function:** This command configures a static RIPng route. The "**no route <*ipv6-address*>**" command deletes this route.
- **Parameter:** Specifies this destination IPv6 address prefix and its length show in colon hex notation.
- **Usage Guide:** The command adds a static RIPng route, and is mainly used for debugging. Routes configured by this command will not appear in kernel route table but in the RIPng route database, however it could be located by using the show ipv6 rip command.
- Command Mode: Router mode
- **Example:** Switch#config terminal
- Switch(config)#router ipv6 rip
- Switch(config-router)#route 3ffe:1234:5678::1/64

4.18 router ipv6 rip

- Command: router ipv6 rip
- no router ipv6 rip
- **Function:** Enable RIPng routing process and entering RIPng mode; the "**no router ipv6 rip**" of this command disables the RIPng routing protocol.
- **Default:** RIPng routing not running.
- Command Mode: Global mode
- **Usage Guide:** This command is for enabling the RIPng routing protocol, this command should be enabled before performing other global configuration of the RIPng protocol.
- **Example:** Enable the RIPng protocol mode.
- Switch(config)#router ipv6 rip

4.19 show debugging ipv6 rip

- Command: show debugging ipv6 rip
- **Function:** Show RIPng debugging status for following debugging options: nsm debugging, RIPng event debugging, RIPng packet debugging and RIPng nsm debugging.
- Command Mode: Admin mode
- Example:
- Switch#show debugging ipv6 rip
- RIPng debugging status:
- RIPng event debugging is on
- RIPng packet detail debugging is on
- RIPng NSM debugging is on

4.20 show ipv6 rip interface

- Command: show ipv6 rip interface
- **Function:** Make sure the interface and line protocols is up.
- Command Mode: Admin mode
- **Example:** Switch(config)#show ipv6 rip interface
- Loopback is up, line protocol is up
- RIPng is not enabled on this interface
- Vlan1 is up, line protocol is up
- Routing Protocol: RIPng
- Passive interface: Disabled
- Split horizon: Enabled with Poisoned Reversed
- IPv6 interface address:
- 3000:1:1::1/64
- fe80::203:fff:fe0c:cda/64

Displayed information	Explanations
Vlan1 is up, line protocol is up	Interface is Up
Routing Protocol: RIP	The routing protocol running on the interface is RIPng
Passive interface: Disabled	Passive-interface disabled

Split horizon: Enabled with Poisoned Reversed	The split horizon is enabled with poisoned reversed on the interface.
IP interface address: 3000:1:1::1/64 fe80::203:fff:fe01:429e/64	IPv6 address of the interface

4.21 show ipv6 rip redistribute

- Command: show ipv6 rip redistribute
- **Function:** Show the configuration information of redistributed other out routing to RIPng.
- Parameter: None.
- **Default:** Not shown by default.
- **Command Mode:** Admin Mode and Configuration Mode.
- Usage Guide: None.
- Example:
- Switch#show ipv6 rip redistribute

4.22 show ipv6 protocols rip

- Command: show ipv6 protocols rip
- **Function:** Show the RIPng process parameters and statistic messages.
- Command Mode: Admin mode
- **Example:** Switch(config)#show ipv6 protocols rip
- Routing Protocol is "RIPng"
- Sending updates every 30 seconds with +/-50%, next due in 1 second
- Timeout after 180 seconds, garbage collect after 120 seconds
- Outgoing update filter list for all interfaces is not set
- Incoming update filter list for all interfaces is not set
- Ethernet1/0/4 filtered by dclist
- Default redistribute metric is 1
- Redistributing: static
- Interface
- Vlan10

- Vlan2
- Routing for Networks:

Displayed information	Explanations
Sending updates every 30 seconds with +/-50%, next due in 1 seconds	Sending updates every 30 seconds
Timeout after 180 seconds, garbage collect after 120 seconds	The route timeout time is 180 seconds, the garbage collect time is 120 seconds
Outgoing update filter list for all interface is not set	Outgoing update filter list for all interface is not set
Incoming update filter list for all interface is not set	Incoming update filter list for all interface is not set
Default redistribution metric is 1	Default redistribution metric is 1
Redistributing: static	Redistricting the static route into the RIP routes
Interface Vlan10 Vlan2	The interfaces running RIP is Vlan 10 and Vlan 2

4.23 show ipv6 rip

- Command: show ipv6 rip
- **Function:** Show RIPng Routing.
- Command Mode: Admin mode
- **Example:** Switch#show ipv6 rip
- Codes: R - RIP, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS,
- B - BGP, a - aggregate, s - suppressed

- Network Next Hop If Met Tag Time

- R 2000:1:1::/64 :: Vlan2 1 0
- R 2001:1:1::/64 fe80::203:fff:fe01:257c Vlan2 2 0 02:40
- R 3000:1:1::/64 :: Vlan10 1 0
- R 3010:1:1::/64 :: -- 1 0
- Amongst R stands for RIP route, namely a RIP route with the destination network address 2001:1:1::/64, next-hop address at fe80::203:fff:fe01:257c. It is learnt from the Ethernet port VLAN2 with a metric value of 2, and still has 2 minutes 40 seconds before time out.
- Equal Command: show ipv6 rip database

4.24 show ipv6 rip database

- Command: show ipv6 rip database
- **Function:** Show messages related to RIPng database.
- Command Mode: Admin mode
- **Example:** Switch#show ipv6 rip database
- Equal Command: show ipv6 rip

4.25 show ipv6 rip aggregate

- Command: show ipv6 rip aggregate
- **Function:** To display the information of IPv6 aggregation route.
- Parameter: None.
- **Command Mode:** Admin and Configuration Mode.
- Default: None.
- **Usage Guide:** This command is used to display which interface the aggregation route be configured, Metric, Count, Suppress and so on, if configured under global mode, then the interface display "----". "Metric" is metric. "Count" is the number of learned aggregation routes. "Suppress" is the times of aggregation.
- **Example:** To display the information of IPv6 aggregation route.
- Switch(config-router)#show ipv rip agg

- Aggregate information of ripng

- Network Aggregated Ifname Metric Count Suppress
- 2001::/16 Vlan1 1 2 0

- 2001:1::/32 ---- 1 2 0
- 2001:1:2::/60 Vlan1 1 1 1
- ---- 1 1 1

Displayed information	Explaination
Network	Route prefix and prefix length.
Aggregated Ifname	To configure the interface name of the aggregation route. If the route aggregated globally, then display “---”.
Metric	Metric of aggregation route.
Count	The number of learned aggregation routes.
Suppress	The times of aggregated for aggregation route.

4.26 show ipv6 rip redistribute

- Command: show ipv6 rip redistribute
- **Function:** Show the configuration information of redistributed other out routing to RIPng.
- Parameter: None.
- **Default:** Not shown by default.
- **Command Mode:** Admin Mode and Configuration Mode.
- Usage Guide: None.
- Example:
- Switch#show ipv6 rip redistribute

4.27 timers basic

- Command: timers basic <update> <invalid> <garbage>
- no timers basic
- **Function:** Adjust the RIP timer update, timeout, and garbage collecting time. The “**no timers basic**” command restores each parameter to their default values.
- **Parameter:** ***<update>*** time interval of sending update packet, shown in seconds and

ranging between 5-2147483647; ***<invalid>*** time period after which the RIP route is advertised dead, shown in seconds and ranging between 5-2147483647; ***<garbage>*** is the hold time in which the a route remains in the routing table after advertised dead, shown in seconds and ranging between 5-2147483647.

- **Default:** ***<update>*** defaulted at 30; ***<invalid>*** defaulted at 180; ***<garbage>*** defaulted at120
- **Command Mode:** Router mode
  Usage Guide: The system is defaulted broadcasting RIPng update packets every 30 seconds; and the route is considered invalid after 180 seconds but still exists for another 120 seconds before it is deleted from the routing table.
- **Example:** Set the RIP update time to 20 seconds and the timeout period to 80 seconds, the garbage collecting time to 60 seconds.
- Switch(Config-Router)#timers basic 20 80 60

Chapter 5 COMMANDS FOR BLACK HOLE ROUTING

5.1 ip route null0

- Command: ip route {<ip-prefix> <mask>|<ip-prefix>|<prefix-length>} null0 [<distance>]
- no ip route {<ip-prefix> <mask>|<ip-prefix>|<prefix-length>} null0
- **Function:** To configure routing destined to the specified network to the interface of null0.
- **Parameters:** ***<ip-prefix>*** and ***<mask>*** are the IP address and network address mask of the destination, in dotted decimal format: ***<ip-prefix>*** and ***<prefix-length>*** are the IP address of the destination and the length of the prefix respectively; **null0** is the output interface for the black hole routing; ***<distance>*** is the management distance of the routing entry with limitation between 1 and 255.
- Default: None.
- **Command Mode:** Global Configuration Mode.
- **Usage Guide:** Null0 should be used as the output interface for IPv4 Black Hole Routing.
- **Example:** To configure the routing to 192.168.188.0/24 as a Black Hole Routing.
- Switch (config)# ip route 192.168.188.0/24 null0 20

5.2 ipv6 route null0

- Command: ipv6 route <ipv6-prefix|prefix-length> null0 [<precedence>]
- no ipv6 route <ipv6-prefix|prefix-length> null0
- **Function:** To configure routing destined to the specified network to the interface of null0.
- **Parameters:** ***<ipv6-prefix>*** is the IPv6 network static route addressof the destination, in dotted decimal format. ***<prefix-length>*** is the IPv6 address of the destination and the length of the prefix. **null0** is the output interface for the black hole routing. ***<precedence>*** is the route weight, ranging between 1 to 255 and 1 by default.
- Default: None.
- **Command Mode:** Global Configuration Mode.
- **Usage Guide:** When configuring IPv6 Black Hole Routing, it is much like configuring normal static routing, but using null0 as the output interface.
- **Example:** To configure a route to 2001:2:3:4::/64 as a Black Hole Routing.
- Switch(config)#ipv6 route 2001:2:3:4::/64 null0

Chapter 6 COMMANDS FOR BFD

6.1 bfd authentication key

- Command: bfd authentication key <*1-255*>
- no bfd authentication key
- **Function:** Enable BFD authentication and configure key for interface, no command disables BFD authentication.
- Parameter: <*1-255*>- key ID.
- **Default:** Do not enable BFD authentication for interface.
- **Command Mode:** interface configuration mode
- **Usage Guide:** Configure key ID of BFD interface, different interfaces can use different way to encrypt and authenticate. Output: the specific BFD interface use encryption authentication.
- **Example:** Enable BFD authentication on interface, key ID is 1.
- s5(config-if-vlan50)#bfd authentication key 1

6.2 bfd authentication key md5

- Command: bfd authentication key <*1-255*> md5 <*WORD*>
- no bfd authentication key <*1-255*>
- **Function:** Configure key and authentication character string encrypted with md5 method for BFD, no command deletes the configured key.
- **Parameter: <*1-255*>** key ID, ***<WORD>*** key string, length from 1 to 16 bytes
- **Default:** No key and character string are configured.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Configure md5 mode and authentication character string for BFD authentication, BFD authentication will be processed by optional fields of packets after this command is configured. BFD will establish neighbor in case that keys in two peers are same.
- **Example:** Use md5 to encrypt, key ID is 1, authentication character string is 123456.
- s5(config)#in vlan 50
- s5(config)#bfd authentication key 1 md5 123456

6.3 bfd authentication key text

- Command: bfd authentication key <*1-255*> text <*WORD*>
- no bfd authentication key <*1-255*>
- **Function:** Configure key and authentication character string encrypted with text method for BFD, no command deletes the configured key.
- **Parameter: <*1-255*>** key ID, **<*WORD*>** key string, length from 1 to 16 bytes
- **Default:** No key and character string are configured.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Configure mode and authentication character string for BFD authentication, BFD authentication will be processed by optional fields of packets after this command is configured. BFD will establish neighbor in case that keys in two peers are same.
- **Example:** Use text to encrypt, key ID is 1, authentication character string is 123456.
- s5(config)#bfd authentication key 1 text 123456

6.4 bfd echo

- Command: bfd echo
- no bfd echo
- **Function:** Enable bfd echo, no command deletes bfd echo.
- Parameter: None
- **Default:** echo is disabled on interface.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Enable bfd echo, session in up mode sends echo packets to reduce frequency of control packets.
- **Example:** Enable echo on interface.
- s5(config)#in vlan 50
- s5(config-if-vlan50)#bfd echo

6.5 bfd echo-source-ip

- Command: bfd echo-source-ip *<ipv4-address>*
- no bfd echo-source-ip
- **Function:** Detect link fault by configuring source address of echo packets, no command deletes the configured source address of echo packets.

- **Parameter:** *<ipv4-address>* is IPv4 address, the validity of parameter should be ensured by users and do not check the validity of address.
- **Default:** No source address of echo packets is configured.
- Command mode: Global mode
- **Usage Guide:** It needs to configure source address of Echo packets when BFD echo detects IPv4 link fault. The configuration for source address is optional, it just avoids ICMP redirect packets to be sent. The destination address of packets is an interface address to ensure that packets can be returned along the original paths. There is no special request for UDP data.
- **Example:** Configure source address of bfd echo packets to 192.168.1.1.
- s5(config)#bfd echo-source-ip 192.168.1.1

6.6 bfd echo-source-ipv6

- Command: bfd echo-source-ipv6 *<ipv6-address>*
- no bfd echo-source-ipv6
- **Function:** Detect link fault by configuring source address of echo packets, no command deletes the configured source address of echo packets.
- **Parameter:** *<ipv6-address>* is IPv6 address, the validity of parameter should be ensured by users and do not check the validity of address.
- **Default:** No source address of echo packets is configured.
- Command mode: Global mode
- **Usage Guide:** It needs to configure source address of Echo packets when BFD echo detects IPv6 link fault. The configuration for source address is optional, it just avoids ICMPv6 redirect packets to be sent. The destination address of packets is an interface address to ensure that packets can be returned along the original paths. There is no special request for UDP data.
- **Example:** Configure source address of bfd echo packets to 2000::1.
- s5(config)#bfd echo-source-ipv6 2000::1

6.7 bfd enable

- Command: bfd enable
- no bfd enable
- **Function:** Enable BFD for VRRP(v3) protocol and enable BFD detection on the group, no command disables BFD for VRRP(v3) protocol.

- Parameter: None.
- **Default:** BFD is not enabled for VRRP(v3).
- **Command Mode:** VRRP(v3) group configuration mode
- **Usage Guide:** After enable BFD detection on the group, if the group receives hello packets when processing backup, it will inform BFD to establish the relevant session. Local ip and remote ip are IP of the interfaces at two peers.
- **Example:** Enable BFD on VRRP group1.
- s5(config)#router vrrp 1
- s5(config-router)#virtual-ip 50.1.1.10
- s5(config-router)#interface vlan 50
- s5(config-router)#bfd enable
- s5(config-router)#enable

- Enable BFD on VRRPv3 group1.
- s5(config)#router ipv6 vrrp 1
- s5(config-router)#virtual-ipv6 fe80::1 interface vlan 50
- s5(config-router)#bfd enable
- s5(config-router)#enable

6.8 bfd interval

- Command: bfd interval <*value1*> min_rx <*value2*> multiplier <*value3*>
- no bfd interval
- **Function:** Configure the minimum transmission interval and the multiplier of session detection for BFD control packets, no command restores the default detection multiplier.
- **Parameter:** <*value1*>- minimum transmission interval, unit is ms, range from 200 to 1000, it may be different for different devices.
- <*value2*>-minimum receiving interval, unit is ms, range from 200 to 1000, it may be different for different devices.
- <*value3*>- multiplier of session detection, range from 3 to 50.
- **Default:** minimum transmission interval is 400ms, minimum receiving interval is 400ms, detection multiplier is 5.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Configure the minimum transmission interval and the multiplier of

session detection for BFD control packets. The default minimum interval is 400ms and detection multiplier is 5.

- **Example:** Set the minimum transmission interval and the minimum receiving interval of BFD are 800ms, detection multiplier is 50 on interface.
- s5(config)#in vlan 50
- s5(config-if-vlan50)#bfd interval 800 min-rx 800 multiplier 50
- s5(config-if-vlan50)#

6.9 bfd min-echo-recv-interval

- Command: bfd min-echo-receive-interval <*value*>
- no bfd min-echo-receive-interval
- **Function:** Configure the minimum receiving interval for BFD control packets, no command restores its default value.
- **Parameter:** <*value*>- minimum receiving interval, unit is ms, range from 200 to 1000, it may be different for different devices.
- **Default:** minimum receiving interval is 400ms.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** <*value*> is minimum receiving interval, unit is ms, range from 200 to 1000, it may be different for different devices. The default minimum receiving interval is 400ms.
- **Example:** Configure the minimum receiving interval is 800ms for bfd echo packets.
- s5(config)#in vlan 50
- s5(config-if-vlan50)#bfd min-echo-recv-interval 800

6.10 bfd mode

- Command: bfd mode {active | passive}
- no bfd mode
- **Function:** Configure BFD working mode before the session is established, the default mode is active mode. No command restores active mode.
- **Parameter:** active-active mode, passive-passive mode.
- **Default:** active mode
- Command Mode: Global mode
- **Usage Guide:** Configure BFD working mode before the session is established, the default mode is active mode. BFD control packets will be sent forwardly whether they

are received or not.

- **Example:** Configure BFD working mode as passive mode globally.
- s1(config)#bfd mode passive

6.11 debug bfd

- Command: debug bfd {packet | event | all | fsm | error | timer}
- **Function:** Enable the relevant debugging for BFD.
- **Parameter:** all： Enable all debugging for BFD
- packet： Enable the debugging of sending and receiving packets for BFD
- event： Enable the debugging of events for BFD
- fsm： Enable the display of state machine for BFD
- error: Enable the display of error events for BFD
- timer: Enable the display of timeout events for BFD
- Default: None.
- Command Mode: Admin mode
- **Usage Guide:** Enable the relevant debugging of BFD.
- **Example:** Enable the debugging of BFD.
- s5#debug bfd all

6.12 ip ospf bfd enable

- Command: ip ospf bfd enable
- no ip ospf bfd enable
- **Function:** Enable BFD for OSPF protocol on the specific interface, no command disables BFD for OSPF protocol.
- Parameter: None.
- **Default:** BFD is not enabled for OSPF protocol.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Configure BFD for OSPF protocol enabled by the specific interface, BFD will inform OSPF after detect link fault and OSPF will deal with it in best times.
- **Example:** Enable BFD for OSPF on interface.
- s5(config-if-vlan50)#ip ospf bfd enable

6.13 ip route bfd

- Command: ip route {vrf <name> <ipv4-address> | <ipv4-address>} mask <nexthop> bfd
- no ip route {vrf <name> <ipv4-address> | <ipv4-address>} mask <nexthop> bfd
- **Function:** Configure BFD for the static route, no command cancels the configuration.
- **Parameter:** *<name>* is vrf name, *<ipv4-address>* is destination address, mask is the subnet mask, nexthop is nexthop address
- **Command Mode:** Global mode
- **Default:** BFD is not configured for the static route.
- **Usage Guide:** Configure BFD for the route and specify the detection mode.
- **Example:** Configure BFD for the static route.
- s3(config)#ip route 10.1.1.0/24 20.1.1.2 bfd

6.14 ipv6 ospf bfd enable

- Command: ipv6 ospf bfd enable
- no ipv6 ospf bfd enable
- **Function:** Configure BFD for OSPFv3 protocol on the specific interface, no command cancels the configuration.
- Parameter: None.
- **Default:** BFD is no enabled for OSPFv3.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Configure BFD for OSPFv3 protocol enabled by the specific interface, BFD will inform OSPFv3 after detect link fault and OSPFv3 will deal with it in best times.
- **Example:** Enable BFD for OSPFv3 on interface.
- s5(config-if-vlan50)#ipv ospf bfd enable

6.15 ipv6 ospf bfd enable instance-id

- Command: ipv6 ospf bfd enable instance-id *<0-255>*
- no ipv6 ospf bfd enable
- **Function:** Configure BFD for OSPFv3 instance on the specific interface, no command cancels the configuration.
- Parameter: None.
- **Default:** BFD is no enabled for OSPFv3 instance.
- **Command Mode:** Interface configuration mode

- **Usage Guide:** Configure BFD for OSPFv3 instance on the specific interface which enable OSPFv3 protocol, BFD will inform OSPFv3 after detect link fault and OSPFv3 will deal with it in best times.
- **Example:** Enable BFD for OSPFv3 on interface.
- s5(config-if-vlan50)#ipv ospf bfd enable instance-id 254

6.16 ipv6 rip bfd enable

- Command: ipv6 rip bfd enable
- no ipv6 rip bfd enable
- **Function:** Configure BFD for RIPng protocol on the specific interface, no command cancels the configuration.
- Parameter: None.
- **Default:** BFD is not enabled for RIPng.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Enable BFD for RIPng protocol, after that, if this interface has received RIPng packets, RIPng will inform BFD to set remote ip as session and detect the state in order to inform RIPng in time.
- **Example:** Enable BFD for RIPng.
- s5(config-if-vlan50)#ipv6 rip bfd enable

6.17 ipv6 route bfd

- Command: ipv6 route {vrf <name> <ipv6-address> | <ipv6-address>} prefix <nexthop> bfd
- no ipv6 route {vrf <name> <ipv6-address>|<ipv6-address>} prefix *<nexthop>* bfd
- **Function:** Configure BFD for the static IPv6 route, no command cancels the configuration.
- **Parameter:** *<name>* is vrf name, *<ipv6-address>* is destination address, prefix is prefix length, vlanid is output interface, nexthop is nexthop address.
- **Default:** BFD is not configured for the static IPv6 route.
- **Command Mode:** Global mode
- **Usage Guide:** Configure BFD for the route and specify the detection mode.
- **Example:** Configure BFD for the static IPv6 route.
- s3(config)#ipv6 route 3000::/64 2010::1 bfd

6.18 neighbor

- Command: neighbor {<ipv6-address> | <ipv4-address>} bfd
- no neighbor {<ipv6-address> | <ipv4-address>}bfd
- **Function:** Enable link detection offered by BFD on the peer neighbor of BGP(4+), no command cancels the configuration.
- **Parameter:** *<ipv4-address>* is IPv4 address
- <ipv6-address> is IPv6 address
- The validity of parameter should be ensured by users and do not check the validity of address.
- **Default:** BFD is not enabled for BGP(4+).
- **Command Mode:** BGP(4+) route configuration mode
- **Usage Guide:** Enable link detection offered by BFD on the peer neighbor of BGP(4+), BFD will inform BGP(4+) protocol after detect the neighbor's link fault.
- Example:
- Enable link detection offered by BFD on the peer neighbor of BGP.
- s5(config)#router bgp 1
- s5(config-router)#neighbor 1.1.1.1 bfd

- Enable link detection offered by BFD on the peer neighbor of BGP4+.
- s5(config-router)#router bgp 1
- s5(config-router)#neighbor 2001::2 remote-as 200
- s5(config-router)#neighbor 2001::2 bfd

6.19 rip bfd enable

- Command: rip bfd enable
- no rip bfd enable
- **Function:** Configure BFD for RIP protocol on the specific interface, no command disables BFD for RIP protocol.
- Parameter: None.
- **Default:** BFD is not enabled for RIP.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Enable BFD for RIP protocol, after that, if this interface has received RIP packets, RIP will inform BFD to set remote ip as session and detect the state in order to inform RIP.

- **Example:** Enable BFD for RIP on interface.
- s5(config-if-vlan50)#rip bfd enable

6.20 show bfd neighbor

- Command: show bfd neighbor [[*<ipv6-address>*|*<ipv4-address*] [details]]
- **Function:** Show BFD neighbor in switch.
- **Parameter:** *<ipv6-address>* specifies the shown neighbor shown of IPv6 address, *<ipv4-address>* specifies the shown neighbor of IPv4 address, IP address refers to remote IP address, details shows the detail information of neighbor.
- Default: None.
- **Command Mode:** Admin mode and configuration mode
- **Usage Guide:** Show BFD neighbor in switch.
- **Example:** Check the relevant information of BFD neighbor.
- s5#show bfd neighbor 50.1.1.1 details

- OurAddr NeighAddr LD/RD Detec Int(ms) State Interface
- 50.1.1.5 50.1.1.1 1/1 2000 Up 3050
- Local Diag: 0, Poll bit: 0
- MinTx Int: 400(ms), MinRx Int: 400(ms), Multiplier: 5
- Received MinRxInt: 400(ms), Received MinTxInt: 400(ms), Received Multiplier: 5
- Local Act Trans Int: 400(ms), Remote Act Trans Int: 400(ms)
- Local Act Detec Int: 2000(ms)
- Registered protocols: RIP
- Echo state: Disable, Echo Detec Int(ms): 2000
- Multi Hop: No, Vrf Id: 0
- Recv Ctl Pkt Num: 631, Send Ctl Pkt Num: 630
- Recv Echo Pkt Num: 0, Send Echo Pkt Num: 0
- Last packet: Version: 1 - Diagnostic: 0
- Poll bit: 0 - Final bit: 0
- Multiplier: 5 - Length: 24
- My Discr: 1 - Your Discr: 1
- Min tx interval: 400(ms) - Min rx interval: 400(ms)
- Min Echo interval: 400(ms)