Content

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

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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-nam*e | *community-list-num*>
[exact-match]**

         **no   match   community   [<*community-list-nam*e | *community-list-num*>
[exact-match]]**

Function: Configure the community attributes of BGP routing messages. The "**no match community   [<*community-list-nam*e | *community-list-num*   >   [exact-match]]**" command deletes this configuration.

Parameter: <*community-list-nam*e   >   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-nam*e >

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-nam*e | *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

Command: set vpnv4 next-hop *<ip_addr>*

            no set vpnv4 next-hop [*<ip_addr>***]**

Function: Configure the next-hop of BGP VPNv4 routing message. The no command deletes the configuration.

Parameter: *<ip_addr>* is the next-hop ip address of VPNv4 route 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 vpnv4 next-hop 10.1.1.1

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

Command: ip route vrf <vrf-name> {<ip-prefix> <mask>|<ip-prefix/prefix-length>}
{<gateway-address>|null0} [<1-255>]

      no ip route vrf <vrf-name> {<ip-prefix> <mask>|<ip-prefix/prefix-length>}
{<gateway-address>|null0} [<1-255>]

Function: Configure the static route for the specific VRF. Before use this command, VPN route forwarding instance must be configured. The no form command will delete the configuration.

Parameters: <vrf-name>: The specific VRF name.

          <ip-prefix>: The destination IP address.

          <mask>: The sub-net mask shown in dotted decimal format.

          <prefix-length>: The prefix length.

          <gateway-address>: The next hop address.

          null0: Black hole route.

          <1-255>: Management distance.

Default: Not configured.

Command Mode: Global configuration mode.

Usage Guide: Configure the static route of VRF-A, the destination IP as 10.1.1.10, the mask as 24 bits, the next hop as 10.1.1.1, the management distance is default:

Switch(config)# ip route vrf VRF-A 10.1.1.10 255.255.255.0 10.1.1.1

Switch(config)#

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

     O - OSPF, IA - OSPF inter area

     N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

     E1 - OSPF external type 1, E2 - OSPF external type 2

     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

Command: show ip route vrf <name> [connected | static | rip| ospf | bgp | isis| kernel|statistics| database[connected | static | rip| ospf | bgp | isis|kernel]]

        show ip route fib vrf <*name*> [default|main|local]

Function: Show the routing tables entries.

Parameters: <name> is the name of the forwarding instance of VPN route; **<*destination*>** is the destination address; **<destination>/<length>** are the network address for the destination as well as the length of the network mask; **connected** is for direct route; **static** is for static route; **rip** is for the RIP route protocol; **ospf** is for the OSPF route protocol; **bgp** is for the BGP route protocol; **isis** is for the ISIS route protocol; **kernel** is for the kernel route protocol; **statistics** are the number of route entries to be displayed; **database** is for the route database; **fib** is for the core route table.

Command Mode: All modes.

Usage Guide: To display the contents of the VPN route table, including route type, destination network address, address mask, the address and interface for the next hop, etc.

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

Command: address-family ipv4 vrf <vrf-name>

           no address-family ipv4 vrf *<vrf-name>*

Function: Configure this command to enable the routing message switching among VRF and enter the address-family mode. The no command deletes the RIP instances related to this VPN routing/forwarding instance.

Parameter: ***<vrf-name>*** specifies the name of VPN routing/forwarding instances.

Command Mode: Router mode

Usage Guide: This command is only used on PE router. A VPN routing/forwarding instance must be generated with command ip vrf prior to using this command by which the VPN routing/forwarding instances can be related to RIP instances.

Example:

Switch# config terminal

Switch(config)# router rip

Switch(config-router)# address-family ipv4 vrf VRF1

        Switch(config-router-af)#

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

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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

1

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

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Interface	The interfaces running RIP is
Vlan10	Vlan 10 and Vlan 2
Vlan2	

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 OSPF

5.1 area authentication

Command: area *<id>* authentication [message-digest]

no area *<id>* authentication

Function: Configure the authentication mode of the OSPF area; the "**no area *<id>* authentication**" command restores the default value.

Parameter: *<id>* is the area number which could be shown in digit, ranging from 0 to 4294967295, or in IP address. **message-digest** is proved by MD5 authentication, or be proved by simple plaintext authentication if not choose this parameter.

Default: No authentication.

Command Mode: OSPF protocol mode

Usage Guide: Set the authentication mode to plaintext authentication or MD5 authentication. The authentication mode is also configurable under interface mode of which the priority is higher than those in the area. It is required to use **ip ospf authentication-key** to set the password while no authentication mode configured at the interface and the area is plaintext authentication, and use ip ospf message-digest key command to configure MD5 key if is MD5 authentication. The area authentication mode could not affect the authentication mode of the interface in this area.

Example: Set the authentication mode in area 0 to MD5.

Switch(config-router)#area 0 authentication message-digest

5.2 area default-cost

Command: area *<id>* default-cost *<cost>*

no area *<id>* default-cost

Function: Configure the cost of sending to the default summary route in stub or NSSA area; the "**no area *<id>* default-cost**" command restores the default value.

Parameter: *<id>* is the area number which could be shown as digits 0 ~ 4294967295, or

as an IP address; *<cost>* ranges between <0-16777215>.

Default: Default OSPF cost is 1.

Command Mode: OSPF protocol mode

Usage Guide: The command is only adaptive to the ABR router connected to the stub area or NSSA area.

Example: Set the default-cost of area 1 to 10.

Switch(config-router)#area 1 default-cost 10

5.3 area filter-list

Command: area *<id>* filter-list {access|prefix} {in|out}

no area *<id>* filter-list {access|prefix} {in|out}

Function: Configure the filter broadcasting summary routing on the ABR; the "**no area *<id>* filter-list {access|prefix} {in|out}**" command restores the default value.

Parameter: *<id>* is the area number which could be shown in digits ranging between 0 ~

4294967295, or as an IP address; access-list is appointed for use in access, so is prefix-list for prefix; ***<name>*** is the name of the filter, the length of which is between 1-256; in means from other areas to this area, out means from this area to other areas.

Default: No filter configured.

Command Mode: OSPF protocol mode

Usage Guide: This command is used for restraining routes from specific area from spreading between this area and other areas.

Example: Set a filter on the area 1.

Switch(config)#access-list 1 deny 172.22.0.0 0.0.0.255

Switch(config)#access-list 1 permit any

Switch(config)#router ospf 100

Switch(config-router)#area 1 filter-list access 1 in

5.4 area nssa

Command: area *<id>* nssa [TRANSLATOR| no-redistribution |DEFAULT-ORIGINATE | no-summary]

no area *<id>* nssa [TRANSLATOR| no-redistribution | DEFAULT-ORIGINATE | no-summary]

Function: Set the area to Not-So-Stubby-Area (NSSA) area.

Parameter: *<id>* is the area number which could be digits ranging between 0~4294967295, and also as an IP address.

TRANLATOR = translator-role {candidate|never|always}, specifies the LSA translation mode for routes: **candidate** means if the router is elected translator, Type 7 LSA can be translated to Type-5 LSA, the default is **candidate.**

never means the router will never translate Type 7 LSA to Type 5 LSA.

always means the route always translate Type 7 LSA to Type 5 LSA.

no-redistribution means never distribute external-LSA to NSSA.

DEFAULT-ORIGINATE=default-information-originate   [metric   <0-16777214>]
[metric-type <1-2>], generate the Type-7 LSA.

metric <0-16777214> specifies the metric value.

metric-type <1-2> specifies the metric value type of external-LSA , default value is 2.

no-summary shows not injecting area route to the NSSA.

Default: No NSSA area defined by default.

Command Mode: OSPF protocol mode

Usage Guide: The same area can not be both NSSA and stub at the same time.

Example: Set area 3 to NSSA.

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#area 0.0.0.51 nssa

Switch(config-router)#area 3 nssa default-information-originate metric 34 metric-type 2 translator-role candidate no-redistribution

5.5 area range

Command: area <id> range <address> [advertise| not-advertise| substitute]
        no area <id> range <address>

Function: Aggregate OSPF route on the area border. The "**no area <id> range <address>**" cancels this function.

Parameter: **<id>** is the area number which could be digits ranging between 0 ~

4294967295, and also as an IP address.

> **<address>=<A.B.C.D/M>** specifies the area network prefix and its length.
> **advertise:** Advertise this area, which is the default.
> **not-advertise :** Not advertise this area.
> **substitute= substitute <A.B.C.D/M>**: advertise this area as another prefix.
> **<A.B.C.D/M>**: Replace the network prefix to be advertised in this area.

Default: Not set.

Command Mode: OSPF protocol mode

Usage Guide: Use this command to aggregate routes inside an area. If the network IDs in this area are not configured continuously, a summary route can be advertised by configuring this command on ABR. This route consists of all single networks belong to specific range.

Example:

Switch#config terminal

Switch(config)# router ospf 100

Switch(config-router)# area 1 range 192.16.0.0/24

5.6 area stub

Command: area *<id>* stub [no-summary]

　　　　　no area *<id>* stub [no-summary]

Function: Define an area to a stub area. The "**no area *<id>* stub [no-summary]**" command cancels this function.

Parameter: *<id>* is the area number which could be digits ranging between 0 ~

4294967295, and also as an IP address.

　　　　　no-summary: The area border routes stop sending link summary announcement to the stub area.

Default: Not defined.

Command Mode: OSPF protocol mode

Usage Guide: Configure area stub on all routes in the stub area. There are two configuration commands for the routers in the stub area: stub and default-cost. All routers connected to the stub area should be configured with area stub command. As for area border routers connected to the stub area, their introducing cost is defined with area default-cost command.

Example:

Switch # config terminal

Switch (config)# router ospf 100

Switch (config-router)# area 1 stub

Related Command: area default-cost

5.7 area virtual-link

Command: area *<id>* virtual-link A.B.C.D {AUTHENTICATION |AUTH_KEY | INTERVAL}

　　　　　no area *<id>* virtual-link A.B.C.D [AUTHENTICATION | AUTH_KEY | INTERVAL]

Function: Configure a logical link between two backbone areas physically divided by non-backbone area. The "**no area *<id>* virtual-link A.B.C.D [AUTHENTICATION | AUTH_KEY | INTERVAL]**" command removes this virtual-link.

Parameter: *<id>* is the area number which could be digits ranging between 0 ~

4294967295, and also as an IP address.

AUTHENTICATION = authentication [message-digest[message-digest-key <1-255> md5 <LINE>] |null|AUTH_KEY].

authentication : Enable authentication on this virtual link.

message-digest: Authentication with MD-5.

null : Overwrite password or packet summary with null authentication.

AUTH_KEY= authentication-key *<key>*.

<key>: A password consists of less than 8 characters.

INTERVAL=   [dead-interval | hello-interval | message-digest-key<1-255>md5<LINE> | retransmit-interval | transmit-delay] <value>.

***<value>:>*:** The delay or interval seconds, ranging between 1~65535.

***<dead-interval>*:** A neighbor is considered offline for certain dead interval without its group messages which the default is 40 seconds.

***<hello-interval>*:** The time interval before the router sends a hello group message, default is 10 seconds.

<message-digest-key>: Authentication key with MD-5.

***<retransmit-interval>*:** The time interval before a router retransmitting a group message, default is 5 seconds.

***<transmit-delay>*:** The time delay before a router sending a group messages, default is 1 second.

Default: None.

Command Mode: OSPF protocol mode

Usage Guide: In the OSPF all non-backbone areas will be connected to a backbone area. If the connection to   the backbone area is lost, virtual link will repair this connection. You can configure virtual link between any two backbone area routers connected with the public non-backbone area. The protocol treat routers connected by virtual links as a point-to-point network.

Example:

Switch#config terminal

Switch(config) #router ospf 100

Switch(config-router) #area 1 virtual-link 10.10.11.50 hello 5 dead 20

Relevant Commands: area authentication, show ip ospf, show ip ospf virtual-links

5.8 auto-cost reference-bandwidth

Command: auto-cost reference-bandwidth *<bandwith>*

no auto-cost reference-bandwidth

Function: This command sets the way in which OSPF calculate the default metric value.

The "**no auto-cost reference-bandwidth**" command only configures the cost to the interface by types.

Parameter: <bandwith> reference bandwidth in Mbps, ranging between 1~4294967.

Default: Default bandwidth is 100Mbps.

Command Mode: OSPF protocol mode

Usage Guide: The interface metric value is acquired by divide the interface bandwith with reference bandwidth. This command is mainly for differentiate high bandwidth links. If several high bandwidth links exist, their cost can be assorted by configuring a larger reference bandwidth value.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#auto-cost reference-bandwidth 50

Relative Command: ip ospf cost

5.9 compatible rfc1583

Command: compatible rfc1583

          no compatible rfc1583

Function: This command configures to rfc1583 compatible. The "**no compatible rfc1583**" command close the compatibility.

Default: Rfc 2328 compatible by default.

Command Mode: OSPF protocol mode

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#compatible rfc1583

5.10 clear ip ospf process

Command: clear ip ospf [<process-id>] process

Function: Use this command to clear and restart OSPF routing processes. One certain OSPF process will be cleared by specifying the process ID, or else all OSPF processes will be cleared.

Default: No default configuration.

Command Mode: Admin mode

Example:

Switch#clear ip ospf process

5.11 debug ospf events

Command: debug ospf events [abr|asbr|lsa|nssa|os|router|vlink]

          no debug ospf events [abr|asbr|lsa|nssa|os|router|vlink]

Function: Open debugging switches showing various OSPF events messages; the "**no debug ospf events [abr|asbr|lsa|nssa|os|router|vlink]**" command closes the debugging switch.

Default: Closed

Command Mode: Admin and global mode

Example:

Switch#debug ospf events router

5.12 debug ospf ifsm

Command: debug ospf ifsm [status|events|timers]

          no debug ospf ifsm [status|events|timers]

Function: Open debugging switches showing the OSPF interface states; the "**no debug ospf ifsm [status|events|timers]**" command closes this debugging switches.

Default: Closed

Command Mode: Admin mode and global mode

Example:

Switch#debug ospf ifsm events

5.13 debug ospf lsa

Command: debug ospf lsa [generate|flooding|install|maxage|refresh]

          no debug ospf lsa [generate|flooding|install|maxage|refresh]

Function: Open debugging switches showing showing link state announcements; the "**no debug ospf lsa [generate|flooding|install|maxage|refresh]**" closes the debugging switches.

Default: Closed

Command Mode: Admin mode and global mode

Example:

Switch#debug ospf lsa generate

5.14 debug ospf nfsm

Command: debug ospf nfsm [status|events|timers]
        no debug ospf nfsm [status|events|timers]
Function: Open debugging switches showing OSPF neighbor state machine; the "**no debug ospf nfsm [status|events|timers]**" command closes this debugging switch.
Default: Closed
Command Mode: Admin mode and global mode
Example:
Switch#debug ospf nfsm events

5.15 debug ospf nsm

Command: debug ospf nsm [interface|redistribute]
        no debug ospf nsm [interface|redistribute]
Function: Open debugging switches showing OSPF NSM, the "**no debug ospf nsm [interface|redistribute]**" command closes this debugging switch.
Default: Closed
Command Mode: Admin mode and global mode
Example:
Switch#debug ospf nsm interface

5.16 debug ospf packet

Command: debug ospf packet [dd | detail | hello | ls-ack | ls-request | ls-update | recv | detail]
        no debug ospf packet [dd | detail | hello | ls-ack | ls-request | ls-update | recv | detail]
Function: Open debugging switches showing OSPF packet messages; the "**no debug ospf packet [dd | detail | hello | ls-ack | ls-request | ls-update | recv | detail]**" command closes this debugging switch.
Default: Closed
Command Mode: Admin mode and global mode
Example:
Switch#debug ospf packet hello

5.17　debug ospf route

Command: debug ospf route [ase|ia|install|spf]

　　　　no debug ospf route [ase|ia|install|spf]

Function: Open debugging switches showing OSPF related routes; the "**no debug ospf route [ase|ia|install|spf]**" command closes this debugging switch.

Default: Closed

Command Mode: Admin mode and global mode

Example:

Switch#debug ospf route spf

5.18　debug ospf redistribute message send

Command: debug ospf redistribute message send

　　　　no debug ospf redistribute message send

Function: To enable debugging of sending command from OSPF process redistributed to other OSPF process routing. The no form of command disables debugging of sending command from OSPF process redistributed to other OSPF process routing.

Parameter: None.

Default: Disabled.

Command Mode: Admin Mode.

Usage Guide: None.

Example: To enable debugging of sending command from OSPF process redistributed to other OSPF process routing.

Switch#debug ospf redistribute message send

5.19　debug ospf redistribute route receive

Command: debug ospf redistribute route receive

　　　　no debug ospf redistribute route receive

Function: To enable/disable debugging switch of received routing message from NSM for OSPF process.

Parameter: None.

Default: Disabled.

Command Mode: Admin Mode.

Usage Guide: None.

Example: To enable debugging switch of received routing message from NSM for OSPF

process.

Switch# debug ospf redistribute route receive

5.20 default-information originate

Command: default-information originate [always | METRIC | METRICTYPE | ROUTEMAP]

     no default-information originate

Function: This command create a default external route to OSPF route area; the "**no default-information originate**" closes this feature.

Parameter: always: Whether default route exist in the software or not, the default route is always advertised.

METRIC = metric *<value>*: Set the metric value for creating default route, *<value>* ranges between 0~16777214, default metric value is 0.

METRICTYPE = metric-type {1|2} set the OSPF external link type of default route.

  1 Set the OSPF external type 1 metric value.

  2 Set the OSPF external type 2 metric value.

ROUTEMAP = route-map *<WORD>*.

  <WORD> specifies the route map name to be applied.

Default: Default metric value is 10; default OSPF external link type is 2.

Command Mode: OSPF protocol mode

Usage Guide: When introducing route into OSPF route area with this command, the system will behaves like an ASBR.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#default-information originate always metric 23 metric-type 2 route-map myinfo

Relevant Commands: route-map

5.21 default-metric

Command: default-metric *<value>*

     no default-metric

Function: The command set the default metric value of OSPF routing protocol; the "**no default-metric**" returns to the default state.

Parameter: *<value>*, metric value, ranging between 0~16777214*.*

Default: Built-in, metric value auto translating.

Command Mode: OSPF protocol mode

Usage Guide: When the default metric value makes the metric value not compatible, the route introducing still goes through. If the metric value can not be translated, the default value provides alternative option to carry the route introducing on. This command will result in that all introduced route will use the same metric value. This command should be used associating redistribute.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#default-metric 100

5.22 distance

Command: distance {<*value*>|ROUTEPARAMETER}

           no distance ospf

Function: Configure OSPF manage distance base on route type. The "**no distance osp**f" command restores the default value.

Parameter: <*value*>, OSPF routing manage distance, ranging between 1~235

ROUTEPARAMETER= ospf {ROUTE1|ROUTE2|ROUTE3}.

ROUTE1= external <external-distance>, Configure the distance learnt from other routing area.

<external-distance> distance value, ranging between 1~255.

ROUTE2= inter-area <inter-distance>, configure the distance value from one area to another area.

<inter-distance> manage distance value, ranging between 1~255.

ROUTE3= intra-area <intra-distance> Configure all distance values in one area.

<intra-distance> Manage distance value, ranging between 1~255.

Default: Default distance value is 110.

Command Mode: OSPF protocol mode

Usage Guide: Manage distance shows the reliability of the routing message source. The distance value may range between 1~255. The larger the manage distance value is, the lower is its reliability.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#distance ospf inter-area 20 intra-area 10 external 40

5.23 distribute-list

Command: distribute-list *<access-list-name>* **out {kernel |connected| static| rip| isis| bgp}**

                no distribute-list out {kernel |connected| static| rip| isis| bgp}

Function: Filter network in the routing update. The "**no distribute-list out {kernel |connected| static| rip| isis| bgp}**" command disables this function.

Parameter: < *access-list-name***>** is the access-list name to be applied.

                out: Filter the sent route update.

                kernel Kernel route.

                 connected Direct route.

                static Static route.

                rip RIP route.

                isis ISIS route.

                bgp BGP route.

Command Mode: OSPF protocol mode

Usage Guide: When distributing route from other routing protocols into the OSPF routing table, we can use this command.

Example: Example below is the advertisement based on the access-list list 1 of the BGP route.

Switch#config terminal

Switch(config)#access-list l1 permit 172.10.0.0 0.0.255.255

Switch(config)#router ospf 100

Switch(config-router)#redistribute bgp

Switch(config-router)#distribute-list 1 out bgp

5.24 filter-policy

Command: filter-policy *<access-list-name>*

          no filter-policy

Function: Use access list to filter the route obtained by OSPF, the no command cancels the route filtering.

Parameter: <*access-list-name***>:** Access list name will be applied, it can use numeric standard IP access list and naming standard IP access list to configure.

Default: There is no default configuration.

Command Mode: OSPF protocol mode

Usage Guide: This command is used to filter the route obtained by OSPF. Do not filter any routes when the specified access list is not exist, for the routes which do not match permit rule of access list, they will be filtered. One access list can be set for this command, only the last configuration takes effect when configuring many times.

Example: Use access list 1 to filter the routes which do not belong to 172.10.0.0/16 segment.

Switch#config terminal

Switch(config)#access-list 1 permit 172.10.0.0 0.0.255.255

Switch(config)#router ospf

Switch(config-router)#filter-policy 1

5.25 host area

Command: host <*host-address*> area <*area-id*> [cost <*cost*>]

            no host <*host-address*> area <*area-id*> [cost <*cost*>]

Function: Use this command to set a stub host entire belongs to certain area. The "**[no] host <*host-address*> area <*area-id*> [cost <*cost*>]**" command cancels this configuration.

Parameter: <*host-address*> is host IP address show in dotted decimal notation.

            <*area-id*> area ID shown in dotted decimal notation or integer ranging between 0~4294967295.

            <*cost*> specifies the entire cost, which is a integer ranging between 0~65535 and defaulted at 0.

Default: No entire set.

Command Mode: OSPF protocol mode

Usage Guide: With this command you can advertise certain specific host route out as stub link. Since the stub host belongs to special router in which setting host is not important.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#host 172.16.10.100 area 1

Switch(config-router)#host 172.16.10.101 area 2 cost 10

5.26 ip ospf authentication

Command: ip ospf [<*ip-address*>] authentication [message-digest|null]

       no ip ospf [<*ip-address*>] authentication

Function: Specify the authentication mode required in sending and receiving OSPF packets on the interfaces; the "**no ip ospf [<*ip-address*>] authentication**" command cancels the authentication.

Parameter: **<*ip-address*>** is the interface IP address, shown in dotted decimal notation.

          message-digest: Use MD5 authentication.

          null: no authentication applied, which resets the password or MD5 authentication applied on the interface.

Default: Authentication not required in receiving OSPF packets on the interface.

Command Mode: Interface Configuration Mode.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf authentication message-digest

5.27 ip ospf authentication-key

Command: ip ospf [<*ip-address*>] authentication-key <*0 LINE | 7 WORD | LINE*>

        no ip ospf [<*ip-address*>] authentication

Function: Specify the authentication key required in sending and receiving OSPF packet on the interface; the no command cancels the authentication key.

Parameter: **<*ip-address*>** is the interface IP address shown in dotted decimal notation; **<LINE>** specifies authentication key. If key option is 0, specify plaintext key. If key option is 7, specify encrypted string. If no option, specify plaintext key by default.

Default: Authentication not required in receiving OSPF packets on the interface.

Command Mode: Interface Configuration Mode.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf authentication-key 0 password

5.28 ip ospf cost

Command: ip ospf [<*ip-address*>] cost <*cost*>

        no ip ospf [<*ip-address*>] cost

Function: Specify the cost required in running OSPF protocol on the interface; the "**no ip ospf [<*ip-address*>] cost**" command restores the default value.

Parameter: *<ip-address>* is the interface IP address shown in dotted decimal notation.

    <cost > is the cost of OSPF protocol ranging between 1~65535.

Default: Default OSPF cost on the interface is auto-figure out based bandwidth.

Command Mode: Interface Configuration Mode.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf cost 3

5.29 ip ospf database-filter

Command: ip ospf [*<ip-address>*] database-filter all out

   no ip ospf [*<ip-address>*] database-filter

Function: The command opens LSA database filter switch on specific interface; the "**no ip ospf [*<ip-address>*] database-filter**" command closes the filter switch.

Parameter: *<ip-address>* is the interface IP address shown in dotted decimal notation;

   all: All LSAs.

   out: Sent LSAs.

Default: Filter switch Closed.

Command Mode: Interface Configuration Mode.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf database-filter all out

5.30 ip ospf dead-interval

Command: ip ospf [*<ip-address>*] dead-interval *<time >*

   no ip ospf [*<ip-address>*] dead-interval

Function: Specify the dead interval for neighboring layer 3 switch; the "**no ip ospf [*<ip-address>*] dead-interval**" command restores the default value.

Parameter: *<ip-address>* is the interface IP address shown in dotted decimal notation;

   <time > is the dead interval length of the neighboring layer 3 switches, shown in seconds and ranging between 1~65535.

Default: The default dead interval is 40 seconds (normally 4 times of the hello-interval).

Command Mode: Interface Configuration Mode.

Usage Guide: If no Hello data packet received after the **dead-interval** period then this

layer 3 switch is considered inaccessible and invalid. This command modifies the dead interval value of neighboring layer 3 switch according to the actual link state. The set **dead-interval** value is written into the Hello packet and transmitted. To ensure the normal operation of the OSPF protocol, the dead-interval between adjacent layer 3 switches should be in accordance or at least 4 times of the **hello-interval** value.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf dead-interval 80

5.31 ip ospf disable all

Command: ip ospf disable all

　　　　　　no ip ospf disable all

Function: Stop OSPF group process on the interface.

Command Mode: Interface Configuration Mode.

Usage Guide: This command resets the network area command and stops group process on specific interface.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf disable all

5.32 ip ospf hello-interval

Command: ip ospf [<*ip-address*>] hello-interval <*time*>

　　　　　　no ip ospf [<*ip-address*>] hello-interval

Function: Specify the hello-interval on the interface; the "**no ip ospf [<*ip-address*>] hello-interval**" restores the default value.

Parameter: **<*ip-address*>** is the interface IP address shown in dotted decimal notation;

　　　　　　<*time*> is the interval sending HELLO packet, shown in seconds and ranging between 1 ~ 65535.

Default: The hello-interval on the interface is 10 seconds.

Command Mode: Interface Configuration Mode.

Usage Guide: HELLO data packet is the most common packet which is periodically sent to adjacent layer 3 switch to discover and maintain adjacent relationship, elect DR and BDR. The user set **hello-interval** value will be written into the HELLO packet and

transmitted. The less the **hello-interval** value is, the sooner the network topological structure is discovered as well larger the cost. The ensure the normal operation of OSPF protocol the **hello-interval** parameter between the layer 3 switches adjacent to the interface must be in accordance.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf hello-interval 20

Relevant Commands: ip ospf dead-interval

5.33 ip ospf message-digest-key

Command: ip ospf [<*ip-address*>] message-digest-key <*key_id*> MD5 <*0 LINE | 7 WORD | LINE*>

　　　　　　no ip ospf [<*ip-address*>] message-digest-key <*key_id*>

Function: Specify the key id and value of MD5 authentication on the interface; the　no command restores the default value.

Parameter: <*ip-address*> is the interface IP address show in dotted decimal notation;

　　　　　<*key_id*> ranges between 1-255;

　　　　　 <*LINE*> is OSPF key. If key option is 0, specify plaintext key. If key option is

　　　　　 7, specify encrypted string. If no option, specify plaintext key by default.

Default: MD5 key is not configured.

Command Mode: Interface Configuration Mode.

Usage Guide: MD5 key encrypted authentication is used for ensure the safety between the OSPF routers on the network. Same key id and key should be configured between neighbors when using this command, or else no adjacent relationship will not be created.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf message-digest-key 2 MD5 0 yourpassword

5.34 ip ospf mtu

Command: ip ospf mtu <*mtu*>

　　　　　no ip ospf mtu

Function: Specify the mtu value of the interface as the OSPF group structure according; the "**no ip ospf mtu**" command restores the default value.

Parameter: ***<mtu>*** is the interface mtu value ranging between 576~65535.

Default: Use the interface mtu acquired from the kernel.

Command Mode: Interface Configuration Mode.

Usage Guide: The interface value configured by this command is only used by OSPF protocol other than updated into kernel.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf mtu 1480

5.35 ip ospf mtu-ignore

Command: ip ospf ***<ip-address>*** **mtu-ignore**

　　　　　no ip ospf ***<ip-address>*** **mtu-ignore**

Function: Use this command so that the mtu size is not checked when switching DD; the "**no ip ospf** ***<ip-address>*** **mtu-ignore**" will ensure the mtu size check when performing DD switch.

Parameter: ***<ip-address>*** is the interface IP address show in dotted decimal notation.

Default: Check mtu size in DD switch.

Command Mode: Interface Configuration Mode.

Example:

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf mtu-ignore

5.36 ip ospf network

Command: ip ospf network {broadcast | non-broadcast | point-to-point | point-to-multipoint}

　　　　　no ip ospf network

Function: This command configures the OSPF network type of the interface; the "**no ip ospf network**" command restores the default value.

Parameter: broadcast: Set the OSPF network type to broadcast.

　　　　　non-broadcast: Set the OSPF network type to NBMA.

　　　　　point-to-point: Set the OSPF network type to point-to-point.

　　　　　point-to-multipoint: Set the OSPF network type to point-to-multipoint.

Default: The default OSPF network type is broadcast.

Command Mode: Interface Configuration Mode.

Example: The configuration below set the OSPF network type of the interface vlan 1 to point-to-point.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf network point-to-point

5.37 ip ospf priority

Command: ip ospf [*<ip-address>*] priority *<priority>*

          no ip ospf [*<ip-address>*] priority

Function: Configure the priority when electing "Defined layer 3 switch" at the interface. The "**no ip ospf [*<ip-address>*] priority**" command restores the default value.

Parameter: *<ip-address>* is the interface IP address show in dotted decimal notation.

          <priority> is the priority of which the valid value ranges between 0 ~ 255.

Default: The default priority when electing DR is 1.

Command Mode: Interface Configuration Mode.

Usage Guide: When two layer 3 switches connected to the same segments both want to be the "Defined layer 3 switch", the priority will decide which one should be chosen. Normally the one with higher priority will be elected, or the one with larger router-id number if the priorities are the same. A layer 3 switch with a priority equal to 0 will not be elected as "Defined layer 3 switch" or "Backup Defined layer 3 switch".

Example: Configure the priority of DR electing. Configure the interface vlan 1 to no election right, namely set the priority to 0.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf priority 0

5.38 ip ospf retransmit-interval

Command: ip ospf [*<ip-address>*] retransmit-interval *<time>*

          no ip ospf [*<ip-address>*] retransmit-interval

Function: Specify the retransmit interval of link state announcements between the interface and adjacent layer 3 switches. The "**no ip ospf [*<ip-address>*] retransmit-interval**" command restores the default value.

Parameter: *<ip-address>* is the interface IP address show in dotted decimal notation.

          <time> is the retransmit interveral of link state announcements between the

interface and adjacent layer 3 switches, shown in seconds ang raning between 1 ~ 65535.

Default: Default retransmit interval is 5 seconds.

Command Mode: Interface Configuration Mode.

Usage Guide: When a layer 3 switch transmits LSA to its neighbor, it will maintain the link state announcements till confirm from the object side is received. If the confirm packet is not received within the interval, the LSA will be retransmitted. The retransmit interval must be larger than the time it takes to make a round between two layer 3 switches.

Example: Configure the LSA retransmit interval of interface vlan 1 to 10 seconds.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf retransmit-interval 10

5.39 ip ospf transmit-delay

Command: ip ospf [<*ip-address*>] transmit-delay <*time*>

           no ip ospf [<*ip-address*>] transmit-delay

Function: Set the transmit delay value of LSA transmitting; the "**no ip ospf [<*ip-address*>] transmit-delay**" restores the default value.

Parameter: <*ip-address*> is the interface IP address show in dotted decimal notation.

           <*time*> is the transmit delay value of link state announcements between the interface and adjacent layer 3 switches, shown in seconds ang raning between 1 ~ 65535.

Default: Default transmit delay value of link state announcements is 1 second.

Command Mode: Interface Configuration Mode.

Usage Guide: The LSA ages with time in the layer 3 switches, but not in the network transmitting process. By adding the **transit-delay** prior to sending the LSA, the LSA will be sent before aged.

Example: Set the LSA transmit delay of interface vlan1 to 3 seconds.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ip ospf transmit-delay 3

5.40 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

5.41 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 >***" command 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 and Keychain Mode.

Example: Switch#config terminal

Switch(config)#key chain mychain

Switch(config-keychain)#

5.42 log-adjacency-changes detail

Command: log-adjacency-changes detail

no log-adjacency-changes detail

Function: Configure to keep a log for OSPF adjacency changes or not.

Parameter: None.

Default: Don't I keep a log for OSPF adjacency changes by default.

Command Mode: OSPF Protocol Configuration Mode

Usage Guide: When this command is configured, the OSPF adjacency changes information will be recorded into a log.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#log-adjacency-changes detail

5.43 max-concurrent-dd

Command: max-concurrent-dd *<value>*

            no max-concurrent-dd

Function: This command set the maximum concurrent number of dd in the OSPF process; the "**no max-concurrent-dd**" command restores the default.

Parameter: *<value>* ranges between ***<1-65535>***, which is the capacity of processing the concurrent dd data packet.

Default: Not set, no concurrent dd limit.

Command Mode: OSPF protocol mode

Usage Guide: Specify the max concurrent number of dd in the OSPF process.

Example: Set the max concurrent dd to 20.

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#max-concurrent-dd 20

5.44 neighbor

Command: neighbor A.B.C.D [*<cost>*| priority *<value>* | poll-interval *<value>*]

            no neighbor A.B.C.D [*<cost>*| priority *<value>* | poll-interval *<value>*]

Function: This command configures the OSPF router connecting NBMA network. The "**no neighbor A.B.C.D [*<cost>*| priority *<value>* | poll-interval *<value>*]**" command removes this configuration.

Parameter: *<cost>*, OSPF neighbor cost value ranging between 1-65535;

            priority *<value>*, neighbor priority defaulted at 0 and ranges between 0-255;

            poll-interval *<value>*, 120s by default, which the polling time before neighbor relationship come into shape , ranging between 1-65535.

Default: No default configuration.

Command Mode: OSPF protocol mode

Usage Guide: Use this command on NBMA network to configure neighbor manually. Every known non-broadcasting neighbor router should be configured with a neighbor entry. The configured neighbor address should be the main address of the interface. The poll-interval should be much larger than the hello-interval.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#neighbor 1.2.3.4 priority 1 poll-interval 90

Switch(config-router)#neighbor 1.2.3.4 cost 15

5.45 network area

Command: network NETWORKADDRESS area <*area-id*>

   no network NETWORKADDRESS area <*area-id*>

Function: This command enables OSPF routing function one the interface with IP address matched with the network address. The "**no network NETWORKADDRESS area <*area-id*>**" command removes the configuration and stop OSPF on corresponding interface.

Parameter: NETWORKADDRESS = A.B.C.D/M | A.B.C.D X.Y.Z.W, Shown with the network address prefix or the mask. Wildcast mask if shown in mask;

   <*area-id*> is the ip address or area number shown in point divided demical system, if shown in demcial integer, it ranges between 0~4294967295.

Default: No default.

Command Mode: OSPF protocol mode

Usage Guide: When certain segment belongs to certain area, interface the segment belongs will be in this area, starting hello and database interaction with the connected neighbor.

Example:

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#network 10.1.1.0/24 area 1

5.46 ospf abr-type

Command: ospf abr-type {cisco|ibm|shortcut|standard}

   no ospf abr-type

Function: Use this command to configure an OSPF ABR type. The "**no ospf abr-type**" command restores the default value.

Parameter: cisco, Realize through cisco ABR;

   ibm, Realize through ibm ABR;

   shortcut, Specify a shortcut-ABR;

   standard, Realize with standard(RFC2328)ABR.

Default: Cisco by default.

Command Mode: OSPF protocol mode

Usage Guide: For Specifying the realizing type of abr. This command is good for interactive operation among different OSPF realizing method and is especially useful in the multiple host environment.

Example: Configure abr as standard.

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#ospf abr-type standard

5.47 ospf router-id

Command: ospf router-id <*address*>

          no ospf router-id

Function: Specify a router ID for the OSPF process. The "**no ospf router-id**" command cancels the ID number.

Parameter: <*address*>, IPv4 address format of router-id.

Default: No default configuration.

Command Mode: OSPF protocol mode

Usage Guide: The new router-id takes effect immediately.

Example: Configure router-id of ospf 100 to 2.3.4.5.

Switch#config terminal

Switch(config)#router ospf 100

Switch(config-router)#ospf router-id 2.3.4.5

5.48 overflow database

Command: overflow database <*maxdbsize* > [{hard|soft}]

          no overflow database

Function: This command is for configuring the max LSA number. The "**no overflow database**" command cancels the limit.

Default: Not configured.

Parameter: < *maxdbsize* >Max LSA numbers, ranging between 0~4294967294.

         soft: Soft limit, warns when border exceeded.

         hard: Hard limit, directly close ospf instance when border exceeded.

         If there is not soft or hard configured, the configuration is taken as hard limit.

Command Mode: OSPF Protocol Mode.

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#overflow database 10000 soft

5.49 overflow database external

Command: overflow database external [<*maxdbsize* > <*maxtime*>]

                no overflow database external [<*maxdbsize* > <*maxtime*>]

Function: The command is for configuring the size of external link database and the waiting time before the route exits overflow state. The "**no overflow database external [<*maxdbsize* > <*maxtime*>]**" restores the default value.

Parameter: < *maxdbsize* **>** size of external link database, ranging between 0~4294967294, defaulted at 4294967294.

         < *maxtime* **>** the seconds the router has to wait before exiting the database overflow, ranging between 0~65535.

Command Mode: OSPF protocol mode

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#overflow database external 5 3

5.50 passive-interface

Command: passive-interface <*ifname*> [<*ip-address*>]

                no passive-interface <*ifname*>[<*ip-address*>]

Function: Configure that the hello group not sent on specific interfaces. The "**no passive-interface <*ifname*> [<*ip-address*>]**"command cancels this function.

Parameter: <*ifname*> is the specific name of interface.

         <*ip-address*> IP address of the interface in dotted decimal format.

Default: Not configured.

Command Mode: OSPF protocol mode

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#passive-interface vlan1

5.51 redistribute

Command: redistribute {kernel |connected| static| rip| isis| bgp} [metric<*value*>]
[metric-type {1|2}][route-map<*word*>][tag<*tag-value*>]

no redistribute {kernel |connected| static| rip| isis| bgp} [metric<*value*>]
[metric-type {1|2}][route-map<*word*>][tag<*tag-value*>]

Function: Introduce route learnt from other routing protocols into OSPF.

Parameter: kernel introduce from kernel route.

connected introduce from direct route.

static introduce from static route.

rip introduce from the RIP route.

isis introduce from ISIS route.

bgp introduce from BGP route.

metric <*value*> is the introduced metric value, ranging between 0-16777214.

metric-type {1|2} is the metric value type of the introduced external route, which can be 1 or 2, and it is 2 by default.

route-map <*word*> point to the probe of the route map for introducing route.

tag<*tag-value*> external identification number of the external route, ranging between 0~4294967295, defaulted at 0.

Command Mode: OSPF Protocol Mode.

Usage Guide: Learn and introduce other routing protocol into OSPF area to generate AS-external_LSAs.

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#redistribute bgp metric 12

5.52 redistribute ospf

Command: redistribute   ospf   [<*process-id*>]   [metric<*value*>]   [metric-type
{1|2}][route-map<*word*>]

no redistribute ospf [<*process-id*>] [metric<*value*>] [metric-type
{1|2}][route-map<*word*>]

Function: To redistribute of process ID routing to this process. The no form of command deletes the redistribution of process ID routing to this process. When input the optional parameters of metric, metric type and routermap, then restores default configuration.

Parameter: process-id is OSPF process ID, 0 by default.

> **metric** *<value>* is the metric for redistributed routing, range between 0 to 16777214.
>
> **metric-type {1|2}** is the metric type for redistributed routing, only can be 1 or 2, and 2 by default.
>
> **route-map** *<word>* is the pointer to the introduced routing map.

Default: Not redistributed any OSPF routing by default.

Command Mode: OSPF Protocol Mode.

Usage Guide: When process-id is not input, that means OSPF routing will be redistributed by default (Process-id is 0).

Example:

Switch(config-router)#redistribute ospf

5.53 router ospf

Command: router ospf *<process_id>* *<vrf-name>*

        no router ospf *<process_id>* *<vrf-name>*

Function: This command is for relating the OSPF process and one VPN, after the configuration succeeded, all configuration conmmands of this OSPF are relating with the VPN. The no command deletes the OSPF instance with VPN routing/ forward instance.

Parameter: *<process_id>* specifies the ID of the OSPF process to be created, the ranging from 1 to 65535.

        <vrf-name> specifies the name of VPN routing/ forward instance.

Command Mode: Global mode

Usage Guide: Before using this command, using ip vrf command creates one VPN routing/ forward instance at first, VPN routing/ forward instance is relating with OSPF instance by this command

Example:

Switch#config terminal

Switch(config)#router ospf 100 VRF1

Switch(config-router)#network 10.1.1.0/24 area 0

5.54 show ip ospf

Command: show ip ospf [*<process-id>*]

Function: Display OSPF main messages.

Parameter: *<process-id>* is the process ID, ranging between 0~65535.

Default: Not displayed

Command Mode: Admin and configuration mode

Example:

Switch#show ip ospf

Routing Process "ospf 0" with ID 192.168.1.1

 Process bound to VRF default

 Process uptime is 2 days 0 hour 30 minutes

 Conforms to RFC2328, and RFC1583Compatibility flag is disabled

 Supports only single TOS(TOS0) routes

 Supports opaque LSA

 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs

 Refresh timer 10 secs

 Number of external LSA 0. Checksum Sum 0x000000

 Number of opaque AS LSA 0. Checksum Sum 0x000000

 Number of non-default external LSA 0

 External LSA database is unlimited.

 Number of LSA originated 0

 Number of LSA received 0

 Number of areas attached to this router: 1

 Area 0 (BACKBONE) (Inactive)

 Number of interfaces in this area is 0(0)

 Number of fully adjacent neighbors in this area is 0

 Area has message digest authentication

 SPF algorithm executed 0 times

 Number of LSA 0. Checksum Sum 0x000000

 Routing Process "ospf 10" with ID 0.0.0.0

 Process bound to VRF test

 Process uptime is 4 days 23 hours 51 minutes

 Conforms to RFC2328, and RFC1583Compatibility flag is disabled

 Supports only single TOS(TOS0) routes

 Supports opaque LSA

 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs

 Refresh timer 10 secs

 Number of external LSA 0. Checksum Sum 0x000000

 Number of opaque AS LSA 0. Checksum Sum 0x000000

 Number of non-default external LSA 0

 External LSA database is unlimited.

Number of LSA originated 0

Number of LSA received 0

Number of areas attached to this router: 1

Area 0 (BACKBONE) (Inactive)

Number of interfaces in this area is 0(0)

Number of fully adjacent neighbors in this area is 0

Area has no authentication

SPF algorithm executed 0 times

Number of LSA 0. Checksum Sum 0x000000

5.55 show ip ospf border-routers

Command: show ip ospf [<*process-id*>] border-routers

Function: Display the intra-domain route entries for the switch to reach ABR and ASBR of all instances.

Parameter: <*process-id*> is the process ID, ranging between 0~65535.

Default: Not displayed

Command Mode: Admin and configuration mode

Example:

Switch#show ip ospf border-routers

OSPF process 0 internal Routing Table

Codes: i - Intra-area route, I - Inter-area route

i 10.15.0.1 [10] via 10.10.0.1, Vlan1, ASBR, Area 0.0.0.0

i 172.16.10.1 [10] via 10.10.11.50, Vlan2, ABR, ASBR, Area 0.0.0.0

5.56 show ip ospf database

Command: show ip ospf [<*process-id*>] database[{

    adv-router [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | asbr-summary[{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | externel [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | network [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | nssa-external [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | opaque-area [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | opaque-as [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    |opaque-link [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

    | router [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]

| summary [{<*linkstate_id*>| self-originate |adv-router <*advertiser_router*>}]
|self-originate | max-age }]

Function: Display the OSPF link state data base messages.

Parameter: <*process-id*> is the process ID, ranging between 0~65535

<*linkstate_id*> Link state ID, shown in point divided demical system

<*advertiser_router*> is the ID of Advertising router, shown in point divided demcial IP address format

Default: Not displayed

Command Mode: Admin and configuration mode

Usage Guide: According to the output messages of this command, we can view the OSPF link state database messages.

Example:

Switch#show ip ospf database

Router Link States (Area 0.0.0.2)

Link ID	ADV Router	Age Seq#	CkSum Link count
192.168.1.2	192.168.1.2	254 0x80000031	0xec21 1
192.168.1.3	192.168.1.3	236 0x80000033	0x0521 2

Net Link States (Area 0.0.0.2)

Link ID	ADV Router	Age Seq#	CkSum
20.1.1.2	192.168.1.2	254 0x8000002b	0xece4

Summary Link States (Area 0.0.0.2)

Link ID	ADV Router	Age Seq#	CkSum	Route
6.1.0.0	192.168.1.2	68 0x8000002b	0x5757	6.1.0.0/22
6.1.1.0	192.168.1.2	879 0x8000002a	0xf8bc	6.1.1.0/24
22.1.1.0	192.168.1.2	308 0x8000000c	0xc8f0	22.1.1.0/24

ASBR-Summary Link States (Area 0.0.0.2)

Link ID	ADV Router	Age Seq#	CkSum
192.168.1.1	192.168.1.2	1702 0x8000002a	0x89c7

AS External Link States

Link ID	ADV Router	Age Seq#	CkSum	Route
2.2.2.0	192.168.1.1	1499 0x80000056	0x3a63	E2 2.2.2.0/24 [0x0]
2.2.3.0	192.168.1.1	1103 0x8000002b	0x0ec3	E2 2.2.3.0/24 [0x0]

5.57 show ip ospf interface

Command: show ip ospf interface *<interface>*

Function: Display the OSPF interface messages.

Parameter: *<interface>* is the name of interface

Default: Not displayed

Command Mode: Admin and configuration mode

Example:

Switch#show ip ospf interface

Loopback is up, line protocol is up

    OSPF not enabled on this interface

Vlan1 is up, line protocol is up

    Internet Address 10.10.10.50/24, Area 0.0.0.0

        Process ID 0, Router ID 10.10.11.50, Network Type BROADCAST, Cost: 10

        Transmit Delay is 5 sec, State Waiting, Priority 1

        No designated router on this network

        No backup designated router on this network

        Timer intervals configured, Hello 35, Dead 35, Wait 35, Retransmit 5

            Hello due in 00:00:16

Neighbor Count is 0, Adjacent neighbor count is 0

5.58 show ip ospf neighbor

Command: show ip ospf [*<process-id>*] neighbor [{*<neighbor_id>* |all |detail [all] |interface *<ifaddress>*}]

Function: Display the OSPF adjacent point messages.

Parameter: *<process-id>* is the process ID ranging between 0~65535

              <neighbor_id> is the dotted decimal notation neighbor ID

              all: Display messages of all neighbors

              detail: Display detailed messages of all neighbors

              <ifaddress> Interface IP address

Default: Not displayed

Command Mode: Admin and configuration mode

Usage Guide: OSPF neighbor state can be checked by viewing the output of this command.

Example:

Switch#show ip ospf neighbor

OSPF process 0:

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.1.1	1	Full/Backup	00:00:32	6.1.1.1	Vlan1
192.168.1.3	1	Full/DR	00:00:36	20.1.1.3	Vlan2
192.168.1.3	1	Full/ -	00:00:30	20.1.1.3	VLINK2

Displayed information	Explanation
Neighbor ID	ID Neighbor ID
Priority	Priority
State	Neighbor relation state
Dead time	Neighbor dead time
Address	Interface Address
Interface	Interface name

5.59 show ip ospf redistribute

Command: show ip ospf [<*process-id*>] redistribute

Function: To display the routing message redistributed from external process of OSPF.

Parameter: *<process-id>* is the process ID ranging between 0~65535.

Default: None.

Command Mode: Admin Mode and Configuration Mode.

Usage Guide: None.

Example:

Switch#show ip ospf redistribute

  ospf process 1 redistribute information：

   ospf process 2

   ospf process 3

   bgp

  ospf process 2 redistribute information：

   ospf process 1

   bgp

  ospf process 3 redistribute information：

    ospf process 1

    bgp

Switch#show ip ospf 2 redistribute

    ospf process 2 redistribute information：

    ospf process 1

    bgp

5.60 show ip ospf route

Command: show ip ospf [<*process-id*>] route

Function: Display the OSPF routing table messages.

Parameter: <*process-id*> is the process ID ranging between 0~65535

Default: Not displayed

Command Mode: Admin and configuration mode

Example:

Switch#show ip ospf route

O   10.1.1.0/24 [10] is directly connected, Vlan1, Area 0.0.0.0

O   10.1.1.4/32 [10] via 10.1.1.4, Vlan1, Area 0.0.0.0

IA 11.1.1.0/24 [20] via 10.1.1.1, Vlan1, Area 0.0.0.0

IA 11.1.1.2/32 [20] via 10.1.1.1, Vlan1, Area 0.0.0.0

IA 12.1.1.0/24 [20] via 10.1.1.2, Vlan1, Area 0.0.0.0

IA 12.1.1.2/32 [20] via 10.1.1.2, Vlan1, Area 0.0.0.0

O   13.1.1.0/24 [10] is directly connected, Vlan4, Area 0.0.0.3

O   14.1.1.0/24 [10] is directly connected, Vlan5, Area 0.0.0.4

IA 15.1.1.0/24 [20] via 13.1.1.2, Vlan4, Area 0.0.0.3

IA 15.1.1.2/32 [20] via 13.1.1.2, Vlan4, Area 0.0.0.3

E1 100.1.0.0/16 [21] via 10.1.1.1, Vlan1

E1 100.2.0.0/16 [21] via 10.1.1.1, Vlan1

5.61 show ip ospf virtual-links

Command: show ip ospf [<*process-id*>] virtual-links

Function: Display the OSPF virtual link message.

Parameter: <*process-id*> is the process ID ranging between 0~65535.

Default: Not displayed

Command Mode: Admin and configuration mode

Example:

Switch#show ip ospf virtual-links

Virtual Link VLINK0 to router 10.10.0.9 is up

   Transit area 0.0.0.1 via interface Vlan1

   Transmit Delay is 1 sec, State Point-To-Point,

   Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

     Hello due in 00:00:02

     Adjacency state Full

Virtual Link VLINK1 to router 10.10.0.123 is down

   Transit area 0.0.0.1 via interface Vlan1

   Transmit Delay is 1 sec, State Down,

   Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

     Hello due in inactive

     Adjacency state Down

5.62 show ip route process-detail

Command: show ip route [database] process-detail

Function: Display the IP routing table with specific process ID or Tag.

Parameters: The parameter of database means displaying all the routers, no parameter means only displaying effective routers.

Default: Not importing any router of OSPF process by default.

Command Mode: Admin mode and configure mode.

Usage Guide: None.

Example:

Switch#show ip route database process-detail

Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP

      O - OSPF, IA - OSPF inter area

      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

      E1 - OSPF external type 1, E2 - OSPF external type 2

      i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

      > - selected route, * - FIB route, p - stale info

C   *> 127.0.0.0/8 is directly connected, Loopback

O   192.168.2.0/24 [110/10] is directly connected, Vlan2, 00:06:13, process 12

C   *> 192.168.2.0/24 is directly connected, Vlan2

5.63 show ip route vrf process-detail

This command is not supported by the switch.

5.64 show ip protocols

Command: show ip protocols

Function: Display the running routing protocol messages.

Default: None

Command Mode: Admin and configuration mode

Example:

Switch#show ip protocols

Use "show ip protocols" command will show the messages of the routing protocol running on current layer 3 switch

For example, the displayed messages are:

Routing Protocol is "ospf 0"

   Invalid after 0 seconds, hold down 0, flushed after 0

   Outgoing update filter list for all interfaces is

   Incoming update filter list for all interfaces is

   Redistributing:

   Routing for Networks:

     10.1.1.0/24

     12.1.1.0/24

   Routing Information Sources:

    Gateway   Distance   Last Update

   Distance: (default is 110)

    Address   Mask   Distance List

Routing Protocol is "bgp 0"

   Outgoing update filter list for all interfaces is

   Incoming update filter list for all interfaces is

   IGP synchronization is disabled

   Automatic route summarization is disabled

   Neighbor(s):

    Address   FiltIn FiltOut DistIn DistOut Weight RouteMap

Incoming Route Filter:

5.65 summary-address

Command: summary-address *<A.B.C.D/M>* **[{not-advertise|tag***<tag-value>***}]**

Function: Summarize or restrain external route with specific address scope.

Parameter: *<A.B.C.D/M>* address scope, shown in dotted decimal notation IPv4 address plus mask length.

      not-advertised restrain the external routes.

      tag*<tag-value>* is the identification label of the external routes, which ranges between 0~4294967295, and is defaulted at 0.

Command Mode: OSPF protocol mode.

Usage Guide: When routes are introduced into OSPF from other routing protocols, it is required to advertise every route in a external LSA. This command is for advertise one summary route for those introduced routes contained in specific network address and masks, which could greatly reduces the size of the link state database.

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#summary-address 172.16.0.0/16 tag 3

5.66 timers spf

Command: timers spf *<spf-delay>* *<spf-holdtime>*

      no timers spf

Function: Adjust the value of the route calculating timer. The "**no timers spf**" command restores relevant values to default.

Parameter: *<spf-delay>* 5 seconds by default.

      <spf-holdtime> 10 seconds by default.

Command Mode: OSPF protocol mode.

Usage Guide: This command configures the delay time between receiving topology change and SPF calculation, further configured the hold item between two discontinuous SPF calculation.

Example:

Switch#config terminal

Switch(config)#router ospf

Switch(config-router)#timers spf 5 10

Chapter 6 Commands for OSPFv3

6.1 area default cost

Command: area <*id*> default-cost <*cost*>

              no area <*id*> default-cost

Function: Configure the cost of sending to the default summary route in stub or NSSA area; the "**no area <*id*> default-cost**" command restores the default value.

Parameter: <*id*> is the area number which could be shown as digits 0 ~ 4294967295, or

as an IP address; <*cost*> ranges between <0-16777215>

Default: Default OSPFv3 cost is 1.

Command Mode: OSPFv3 protocol mode

Usage Guide: The command is only adaptive to the ABR router connected to the stub area.

Example: Set the default-cost of area 1 to 10

Switch(config-router)#area 1 default-cost 10

6.2 area range

Command: area <*id*> range <ipv6*address*> [advertise| not-advertise|]

              no area <*id*> range <ipv6*address*>

Function: Aggregate OSPF route on the area border. The "**no area <*id*> range <*address*>**" cancels this function.

Parameter: <*id*> is the area number which could be digits ranging between 0 ~

4294967295, and also as an IP address.

              <ipv6*address*>=<*X:X::X:X/M*>,Specifies the area ipv6 network prefix and its length

              advertise: Advertise this area

              not-advertise : Not advertise this area

               If both are not set, this area is defaulted for advertising

Default: Function not configured.

Command Mode: OSPFv3 protocol mode

Usage Guide: Use this command to aggregate routes inside an area. If the network IDs in this area are not configured continuously, a summary route can be advertised by

1

configuring this command on ABR. This route consists of all single networks belong to specific range.

Example:

Switch # config terminal

Switch (config)# router ipv6 ospf

Switch (config-router)# area 1 range 2000::/3

6.3 area stub

Command: area *<id>* stub [no-summary]

　　　　no area *<id>* stub [no-summary]

Function: Define an area to a stub area. The "**no area *<id>* stub [no-summary]**" command cancels this function.

Parameter: *<id>* is the area number which could be digits ranging between 0 ~

4294967295, and also as an IPv4 address.

no-summary: The area border routes stop sending link summary announcement to the stub area

Default: Not defined

Command Mode: OSPFv3 protocol mode

Usage Guide: Configure area stub on all routes in the stub area. There are two configuration commands for the routers in the stub area: stub and default-cost. All routers connected to the stub area should be configured with area stub command. As for area border routers connected to the stub area, their introducing cost is defined with area default-cost command.

Example:

Switch # config terminal

Switch (config)# router ipv6 ospf

Switch (config-router)# area 1 stub

Relevant Commands: area default-cost

6.4 area virtual-link

Command: area *<id>* virtual-link A.B.C.D [instance-id *<instance-id>* | INTERVAL *<value>*]

　　　　no area *<id>* virtual-link A.B.C.D [instance-id *<instance-id>* | INTERVAL]

Function: Configure a logical link between two backbone areas physically divided by non-backbone area. The "**no area *<id>* virtual-link A.B.C.D [instance-id *<instance-id>***

| INTERVAL]" command removes this virtual-link.

Parameter: *<id>* is the area number which could be digits ranging between 0 ~ 4294967295, and also as an IP address.

    <instance-id> is the interface instance ID ranging between 0~255 and defaulted at 0

    INTERVAL= [dead-interval|hello-interval|retransmit-interval|transmit-delay]

    <value>: The delay or interval seconds, ranging between 1~65535

    <dead-interval>:   A neighbor is considered offline for certain dead interval without its group messages which the default is 40 seconds.

    <hello-interval>:   The time interval before the router sends a hello group message, default is 10 seconds

    <retransmit-interval>:   The time interval before a router retransmitting a group message, default is 5 seconds

    <transmit-delay>: The time delay before a router sending a group messages, 1 second by default

Default: No default configuration.

Command Mode: OSPFv3 protocol mode

Usage Guide: In the OSPF all non-backbone areas will be connected to a backbone area. If the connection to the backbone area is lost, virtual link will repair this connection. You can configure virtual link between any two backbone areas routers connected with the public non-backbone area. The protocol treat routers connected by virtual links as a point-to-point network.

Example:

Switch#config terminal

Switch(config) #router ipv6 ospf

Switch(config-router) #area 1 virtual-link 10.10.11.50 hello 5 dead 20

Switch(config-router) #area 1 virtual-link 10.10.11.50 instance-id 1

6.5 abr-type

Command: abr-type {cisco|ibm| standard}

               no abr-type [cisco|ibm| standard]

Function: Configure an OSPF ABR type with this command. The "**no abr-type [cisco|ibm| standard]**" command restores the default.

Parameter: cisco, realize by cisco ABR; **ibm**, realize by ibm ABR; **shortcut**, specify a shortcut-ABR; **standard**, realize with standard（RFC2328）ABR.

Default: Cisco configured by default

Command Mode: OSPFv3 protocol mode

Usage Guide: For Specifying the realizing type of abr. This command is good for interactive operation among different OSPF realizing method and is especially useful in the multiple host environment.

Example: Configure ABR as standard.

Switch#config terminal

Switch(config)#router ipv6 ospf

Switch(config-router)#abr-type standard

6.6 default-metric

Command: default-metric <*value*>

          no default-metric

Function: The command set the default metric value of OSPF routing protocol; the "**no default-metric**" returns to the default state.

Parameter: <*value*>, metric value, ranging between 1~16777214.

Default: Built-in, metric value auto translating.

Command Mode: OSPF protocol mode

Usage Guide: When the default metric value makes the metric value not compatible, the route introducing still goes through. If the metric value can not be translated, the default value provides alternative option to carry the route introducing on. This command will result in that all introduced route will use the same metric value. This command should be used associating redistribute.

Example:

Switch#config terminal

Switch(config)#router ipv6 ospf

Switch(config-router)#default-metric 100

6.7 debug ipv6 ospf events

Command: [no] debug ipv6 ospf events [abr|asbr|os|router|vlink]

Function: Open debugging switches showing OSPF events. The "**no debug ipv6 ospf events [abr|asbr|os|router|vlink]**" command closes this debugging switch.

Default: Closed.

Command Mode: Admin mode

Example:

Switch#debug ipv6 ospf events

1970/01/01 01:10:35 IMI: ROUTER[Process:(null)]: GC timer expire

6.8 debug ipv6 ospf ifsm

Command: [no] debug ipv6 ospf ifsm [status|events|timers]

Function: Open debugging switches showing the OSPF interface states; the "**[no] debug ospf ifsm [status|events|timers]**" command closes this debugging switches.

Default: Closed.

Command Mode: Admin mode

Example:

Switch#debug ipv6 ospf ifsm

1970/01/01 01:11:44 IMI: IFSM[Vlan1]: Hello timer expire

1970/01/01 01:11:44 IMI: IFSM[Vlan2]: Hello timer expire

6.9 debug ipv6 ospf lsa

Command: [no]debug ipv6 ospf lsa [generate|flooding|install|maxage|refresh]

Function: Open debugging switches showing showing link state announcements; the "**no debug ospf lsa [generate|flooding|install|maxage|refresh]**" closes the debugging switches.

Default: Closed.

Command Mode: Admin mode

6.10 debug ipv6 ospf nfsm

Command: [no] debug ipv6 ospf nfsm [status|events|timers]

Function: Open debugging switches showing showing OSPF neighbor state machine; the "**no debug ipv6 ospf nfsm [status|events|timers]**" command closes this debugging switch.

Default: Closed.

Command Mode: Admin mode

Switch#debug ipv6 ospf nfsm

1970/01/01 01:14:07 IMI: NFSM[192.168.2.3-000007d4]: LS update timer expire

1970/01/01 01:14:07 IMI: NFSM[192.168.2.1-000007d3]: LS update timer expire

1970/01/01 01:14:08 IMI: NFSM[192.168.2.1-000007d3]: Full (HelloReceived)

1970/01/01 01:14:08 IMI: NFSM[192.168.2.1-000007d3]: nfsm_ignore called

1970/01/01 01:14:08 IMI: NFSM[192.168.2.1-000007d3]: Full (2-WayReceived)

6.11 debug ipv6 ospf nsm

Command: [no] debug ipv6 ospf nsm [interface|redistribute]
Function: Open debugging switches showing showing OSPF NSM, the "**no debug ipv6 ospf nsm [interface|redistribute]**" command closes this debugging switch.
Default: Closed.
Command Mode: Admin mode

6.12 debug ipv6 ospf packet

Command: [no] debug ipv6 ospf packet [dd | detail | hello | ls-ack | ls-request | ls-update | recv | send]
Function: Open debugging switches showing OSPF packet messages; the "**no debug ipv6 ospf packet [dd | detail | hello | ls-ack | ls-request | ls-update | recv | send]**" command closes this debugging switch.
Default: Closed.
Command Mode: Admin Mode.

6.13 debug ipv6 ospf redistribute message send

Command: debug ipv6 ospf redistribute message send
               no debug ipv6 ospf redistribute message send
Function: To enable/disable debugging of sending command from IPv6 OSPF process redistributed to other IPv6 OSPF process routing.
Parameter: None.
Default: Disabled.
Command Mode: Admin Mode.
Usage Guide: None.
Example:
Switch#debug ipv6 ospf redistribute message send

6.14 debug ipv6 ospf redistribute route receive

Command: debug ipv6 ospf redistribute route receive
               no debug ipv6 ospf redistribute route receive
Function: To enable/disable debugging of received routing message from NSM for IPv6 OSPF process.

Parameter: None.

Default: Disabled.

Command Mode: Admin Mode.

Usage Guide: None.

Example:

Switch# debug ipv6 ospf redistribute route receive

6.15 debug ipv6 ospf route

Command: [no] debug ipv6 ospf route [ase|ia|install|spf]

Function: Open debugging switches showing OSPF related routes; the "**[no]debug ipv6 ospf route [ase|ia|install|spf]**" command closes this debugging switch.

Default: Closed.

Command Mode: Admin mode

6.16 ipv6 ospf cost

Command: ipv6 ospf cost <*cost*> [instance-id <*id*>]

              no ipv6 ospf <*cost*> [instance-id <*id*>]

Function: Specify the cost required in running OSPF protocol on the interface; the "**no ipv6 ospf cost [instance-id <*id*>]**" command restores the default value.

Parameter: <*id*> is the interface instance ID, ranging between 0~255, defaulted at 0

              <*cost* > is the cost of OSPF protocol ranging between 1~65535.

Default: Default OSPF cost on the interface is 10.

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 vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf cost 3

6.17 ipv6 ospf dead-interval

Command: ipv6 ospf dead-interval <*time* > [instance-id <*id*>]

              no ipv6 ospf dead-interval [instance-id <*id*>]

Function: Specify the dead interval for neighboring layer 3 switch; the "**no ipv6 ospf**

dead-interval [instance-id <id>]" command restores the default value.

Parameter: **<id>** is the interface instance ID, ranging between 0~255, defaulted at 0

<time > is the length of the adjacent layer 3 switch, in seconds, ranging between 1 ~ 65535

Default: The default dead interval is 40 seconds (normally 4 times of the hello-interval).

Command Mode: Interface Configuration Mode.

Usage Guide: If no HELLO data packet received after the **dead-interval** period then this layer 3 switch is considered inaccessible and invalid. This command modifies the dead interval value of neighboring layer 3 switch according to the actual link state. The set **dead-interval** value is written into the Hello packet and transmitted. To ensure the normal operation of the OSPF protocol, the dead-interval between adjacent layer 3 switches should be in accordance or at least 4 times of the **hello-interval** value. 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 vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf dead-interval 80

6.18 ipv6 ospf display route single-line

Command: [no] ipv6 ospf display route single-line

Function: **show ipv6 ospf route** change the display results of show ipv6 ospf route command. The "**no ipv6 ospf display route single-line**" restores to default display mode.

Default: Not configured

Command Mode: Global Mode

Usage Guide: The show ipv6 ospf route command displays the same route in several lines. This command will strict that one route will be displayed in one line.

Example:

Switch#config terminal

Switch(config)#ipv6 ospf display route single-line

6.19 ipv6 ospf hello-interval

Command: ipv6 ospf hello-interval <time> [instance-id <id>]

no ipv6 ospf hello-interval [instance-id <id>]

Function: Specify the hello-interval on the interface; the "**no ipv6 ospf hello-interval [instance-id <id>]**" restores the default value.

Parameter: ***<id>*** is the interface instance ID, ranging between 0~255, defaulted at 0

 <time > is the length of the adjacent layer 3 switch, in seconds, ranging between 1 ~ 65535

Default: Default HELLO packet sending interval is 10 seconds.

Command Mode: Interface Configuration Mode.

Usage Guide: HELLO data packet is the most common packet which is periodically sent to adjacent layer 3 switch to discover and maintain adjacent relationship, elect DR and BDR. The user set **hello-interval** value will be written into the HELLO packet and transmitted. The less the **hello-interval** value is, the sooner the network topological structure is discovered as well larger the cost. The ensure the normal operation of OSPF protocol the **hello-interval** parameter between the layer 3 switches adjacent to the interface must be in accordance. 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 vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf hello-interval 20

Relevant Commands: ipv6 ospf dead-interval

6.20 ipv6 ospf priority

Command: ipv6 ospf priority *<priority>* [instance-id *<id>*]

 no ipv6 ospf priority[instance-id *<id>*]

Function: Configure the priority when electing "Defined layer 3 switch" at the interface. The "**no ipv6 ospf [*<ip-address>*] priority**" command restores the default value.

Parameter: ***<id>*** is the interface instance ID, ranging between 0~255, and defaulted at 0

 <priority> is the priority of which the valid value ranges between 0 ~ 255.

Default: The default priority when electing DR is 1.

Command Mode: Interface Configuration Mode.

Usage Guide: When two layer 3 switches connected to the same segments both want to be the "Defined layer 3 switch", the priority will decide which one should be chosen. Normally the one with higher priority will be elected, or the one with larger router-id number if the priorities are the same. A layer 3 switch with a priority equal to 0 will not be elected as "Defined layer 3 switch" or "Backup Defined layer 3 switch". The command can

configure on IPv6 tunnel interface, but it is successful configuration to only configure tunnel carefully.

Example: Configure the priority of DR electing. Configure the interface vlan 1 to no election right, namely set the priority to 0.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf priority 0

6.21 ipv6 ospf retransmit-interval

Command: ipv6 ospf retransmit-interval *<time>* [instance-id *<id>*]

        no ipv6 ospf retransmit-interval [instance-id *<id>*]

Function: Specify the retransmit interval of link state announcements between the interface and adjacent layer 3 switches. The "**no ipv6 ospf retransmit-interval [instance-id *<id>*]**" command restores the default value.

Parameter: *<id>* is the interface instance ID, ranging between 0~255, defaulted at 0

        <time> is the retransmit interval of link state announcements between the interface and adjacent layer 3 switches, shown in seconds and ranging between 1 ~

65535.

Default: Default retransmit interval is 5 seconds.

Command Mode: Interface Configuration Mode.

Usage Guide: When a layer 3 switch transmits LSA to its neighbor, it will maintain the link state announcements till confirm from the object side is received. If the confirm packet is not received within the interval, the LSA will be retransmitted. The retransmit interval must be larger than the time it takes to make a round between two layer 3 switches. The command can configure on IPv6 tunnel interface, but it is successful configuration to only configure tunnel carefully.

Example: Configure the LSA retransmit interval of interface vlan 1 to 10 seconds.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf retransmit-interval 10

6.22 ipv6 ospf transmit-delay

Command: ipv6 ospf transmit-delay *<time>* [instance-id *<id>*]

        no ipv6 ospf transmit-delay [instance-id *<id>*]

Function: Configure the LSA sending delay time on the interface. The "**no ipv6 ospf**

transmit-delay [instance-id <*id*>]" command restores to the default.

Parameter: <*id*> is the instance ID ranging between 0~255 and defaulted at 0

> **<*time*>** is the delay time of sending LSA on the interface, which is shown in seconds and ranged between 1 ~ 65535.

Default: The default delay time of send LSA on the interface is 1 second by default.

Command Mode: Interface Configuration Mode.

Usage Guide: The LSA ages by time in the layer 3 switches but not in the transmission process. So by increasing the **transmit-delay** before sending LSA so that it will be sent out. The command can configure on IPv6 tunnel interface, but it is successful configuration to only configure tunnel carefully.

Example: Set the interface vlan 1 LSA sending delay to 3 seconds.

Switch#config terminal

Switch(config)#interface vlan 1

Switch(Config-if-Vlan1)#ipv6 ospf transmit-delay 3

6.23 ipv6 router ospf

Command: [no] ipv6 router ospf {area <*area-id*> [instance-id <*instance-id*>]| tag <*tag*>[instance-id <*instance-id*>]}| tag <*tag*> area <*area-id*> [instance-id <*instance-id*>]}

Function: Enable ospf route on the interface; the "**no ipv6 router ospf {area <*area-id*> [instance-id <*instance-id*>]| tag <*tag*>[instance-id <*instance-id*>]}| tag <*tag*> area <*area-id*> [instance-id <*instance-id*>]}**" command cancels this configuration.

Parameter: <*area-id*> is an area ID which could be shown in digits ranging between 0 ~

4294967295, or an IPv4 address

> **<*instance-id*>** is the interface instance ID ranging between 0~255 and defaulted at 0.

> **<*tag*>** ospfv3 process identifier

Default: Not configured

Command Mode: Interface Configuration Mode.

Usage Guide: To enable this command on the interface, the area id must be configured. The instance ID and instance tag are optional. The ospfv3 process allows one routing instance for each instance ID. The route can be enabled on a interface with a instance ID. If the instance IDs are different, several OSPF process can be run on one interface. However different OSPF process should not use the same instance ID 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 vlan 1

Switch(Config-if-Vlan1)#ipv6 router ospf area 1 tag IPI instance-id 1

6.24 max-concurrent-dd

Command: max-concurrent-dd *<value>*

　　　　　　no max-concurrent-dd

Function: Configure with this command the current dd max concurrent number in the OSPF processing. The "**no max-concurrent-dd**" command restores the default.

Parameter: *<value>* ranges between ***<1-65535>*,** the capacity of concurrent dd data packet processing.

Default: No default configuration. No dd concurrent limit.

Command Mode: OSPFv3 protocol mode

Usage Guide: Specify the current dd max concurrent number in the OSPF processing.

Example: Set the max concurrent dd to 20.

Switch#config terminal

Switch(config)#router ipv6 ospf

Switch(config-router)#max-concurrent-dd 20

6.25 passive-interface

Command: [no] passive-interface {*<ifname>*|vlan *<vlan-id>*}

Function: Configure that the hello group not sent on specific interfaces. The "**no passive-interface{*<ifname>*|vlan *<vlan-id>*}**" command cancels this function.

Parameter: *<ifname>* is the specific name of interface.

Default: Not configured

Command Mode: OSPFv3 protocol mode

Example: Switch#config terminal

　　　　　Switch(config)#router ipv6 ospf

　　　　　Switch(config-router)#passive-interface vlan1

6.26 redistribute

Command: [no] redistribute {kernel |connected| static| rip| isis| bgp} [metric*<value>*]

[metric-type {1|2}][route-map<*word*>]

Function: Introduce route learnt from other routing protocols into OSPFv3.

Parameter: kernel Introduct from kernel route

connected Introduce from direct route

static Introduce from static route

rip Introduce from the RIP route

isis Introduce from ISIS route

bgp Introduce from BGP route

metric <*value*> is the introduced metric value, ranging between 0-16777214

metric-type {1|2} is the metric value type of the introduced external route, which can be 1 or 2, and it is 2 by default

route-map <*word*> targets to the probe of the route map for introducing route

Command Mode: OSPFv3 protocol mode

Usage Guide: Learn and introduce other routing protocol into OSPFv3 area to generate AS-external_LSAs.

Example: Switch#config terminal

Switch(config)#router ipv6 ospf

Switch(config-router)#redistribute bgp metric 12 metric-type 1

6.27 redistribute ospf

Command: redistribute ospf [<*process-tag*>] [metric<*value*>] [metric-type {1|2}] [route-map<*word*>]

no redistribute ospf [<*process-tag*>] [metric<*value*>] [metric-type {1|2}][route-map<*word*>]

Function: To redistribute routing information form process-tag to this command. The no form of command cancels the redistribution of process-tag routing to this process. When input the optional parameters of metric, metric type and routermap, then restores default configuration.

Parameter: process-tag is the process ID of IPv6 OSPF process, NULL by default.

metric <*value*> is the metric for redistributed routing, range between 0 to 16777214.

metric-type {1|2} is the metric type for redistributed routing, only can be 1 or 2, and 2 by default.

route-map <*word*> is the pointer to the introduced routing map.

Default: Not redistributed any OSPFfv3 routing by default.

Command Mode: Router IPv6 OSPF Configuration Mode.

Usage Guide: When process-id is not input, that means OSPFv3 routing will be

redistributed by default (Process-tag is NULL). The no form of command input the optional parameters of metric, metric-type and routermap, then restores default configuration. When not input any optional parameters that mean to delete the router of redistributed process.

Example:

Switch(config)#router ipv6 ospf

Switch(config-router)#redistribute ospf

6.28 router-id

Command: router-id *<router-id>*

               no router-id

Function: Configure router ID for ospfv3 process. The "**no router-id**"restores ID to 0.0.0.0.

Parameter: *<router-id>>* is the router ID shown in IPv4 format.

Default: 0.0.0.0 by default.

Usage Guide: If the router-id is 0.0.0.0, the ospfv3 process can not be normally enabled. It is required to configure a router-id for ospfv3.

Command Mode: OSPFv3 protocol mode

Example: Switch#config terminal

               Switch(config)#router ipv6 ospf

               Switch(config-router)#router-id 192.168.2.1

6.29 router ipv6 ospf

Command: [no] router ipv6 ospf [*<tag>*]

Function: This command initializes the ospfv3 routing process and enters ospfv3 mode for configuring the ospfv3 routing process. The "**no router ipv6 ospf [*<tag>*]**" command stops relevant process.

Parameter: *<tag>* ospfv3 is the process mark which could be random strings made up of characters and digits

Command Mode: Global mode

Usage Guide: To let he ospfv3 routing process work properly, this command must be configured and ospfv3 must at least be enabled on one interface. When the tag configured by the ipv6 router ospf area command under interface mode matches with the tag of ospf process, the ospfv3 process is enabled on this interface.

Example: Switch#config terminal

Switch(config)#router ipv6 ospf IPI

6.30 show ipv6 ospf

Command: show ipv6 ospf [*<tag>*]

Function: Display OSPF global and area messages.

Parameter: *<tag>* is the process tag which is a character string.

Default: Not displayed.

Command Mode: All modes

Example:

Switch#show ipv6 ospf

Routing Process "OSPFv3 (*null*)" with ID 192.168.2.2

 SPF schedule delay 5 secs, Hold time between SPFs 10 secs

 Minimum LSA interval 5 secs, Minimum LSA arrival 1 secs

 Number of external LSA 0. Checksum Sum 0x0000

 Number of AS-Scoped Unknown LSA 0

 Number of LSA originated 6

 Number of LSA received 14

 Number of areas in this router is 1

   Area BACKBONE(0)

      Number of interfaces in this area is 2

      SPF algorithm executed 6 times

      Number of LSA 8.   Checksum Sum 0x43D52

      Number of Unknown LSA 0

6.31 show ipv6 ospf database

Command: show ipv6 ospf [*<tag>*] database

 [router [adv-router *<advertiser_router>*]

  |network [adv-router *<advertiser_router>*]

  | intra-prefix [adv-router *<advertiser_router>*]

  | link [adv-router *<advertiser_router>*]

  | external [adv-router *<advertiser_router>*]

  | inter-prefix [adv-router *<advertiser_router>*]

  | inter-router [adv-router *<advertiser_router>*]]

Function: Display the OSPF link state data base message.

Parameter: *<tag>* is the process tag which is a character string.

        <advertiser_router> is the ID of Advertising router, shown in IPv4 address format

Default: Not displayed

Command Mode: All modes

Usage Guide: According to the output messages of this command, we can view the OSPF link state database messages.

Example:

Use show ipv6 ospf database command will be able to show LSA messages of the OSPF routing protocol

For Example, the displayed messages are:

          OSPFv3 Router with ID (192.168.2.2) (Process *null*)

           Link-LSA (Interface Vlan1)

Link State ID	ADV Router	Age	Seq#	CkSum	Prefix
0.0.7.211	192.168.2.2	1409	0x80000001	0x6dda	1
0.0.7.212	192.168.2.3	1357	0x80000001	0x248e	1

           Link-LSA (Interface Vlan2)

Link State ID	ADV Router	Age	Seq#	CkSum	Prefix
0.0.7.211	192.168.2.1	1450	0x80000001	0xa565	1
0.0.7.212	192.168.2.2	1399	0x80000001	0x4305	1

           Router-LSA (Area 0.0.0.0)

Link State ID	ADV Router	Age	Seq#	CkSum	Link
0.0.0.0	192.168.2.1	1390	0x80000006	0x9fe2	1
0.0.0.0	192.168.2.2	1354	0x80000007	0x4af5	2
0.0.0.0	192.168.2.3	1308	0x80000004	0xbbc4	1

           Network-LSA (Area 0.0.0.0)

Link State ID	ADV Router	Age	Seq#	CkSum
0.0.7.211	192.168.2.1	1390	0x80000001	0x897e
0.0.7.211	192.168.2.2	1354	0x80000001	0x9b69

           Intra-Area-Prefix-LSA (Area 0.0.0.0)

Link State ID	ADV Router	Age	Seq#	CkSum	Prefix	Reference
0.0.0.1	192.168.2.1	1389	0x80000005	0x7e2e	1	Router-LSA
0.0.0.2	192.168.2.1	1389	0x80000001	0x22cb	1	Network-LSA
0.0.0.1	192.168.2.3	1306	0x80000002	0xd0d7	1	Router-LSA

Displayed information's	Explanations
Link-LSA (Interface Vlan1)	Link LSA messages of interface Vlan1
Router-LSA (Area 0.0.0.0)	Router LSA messages in Area 0
Network-LSA (Area 0.0.0.0)	Network LSA in Area 0

Intra-Area-Prefix-LSA (Area 0.0.0.0)	Intra-domain Prefix LSA in Area 0

6.32 show ipv6 ospf interface

Command: show ipv6 ospf interface *<ifname>*|vlan *<vlan-id>*

Function: Display the OSPF interface messages.

Parameter: *<ifname>* is the name of the interface.

Default: Not displayed

Command Mode: All modes

Example:

Switch#show ipv6 ospf interface

Loopback is up, line protocol is up

   OSPFv3 not enabled on this interface

Vlan1 is up, line protocol is up

   Interface ID 2003

   IPv6 Prefixes

      fe80::203:fff:fe01:257c/64 (Link-Local Address)

      2001:1:1::1/64

   OSPFv3 Process (*null*), Area 0.0.0.0, Instance ID 0

      Router ID 192.168.2.2, Network Type BROADCAST, Cost: 10

      Transmit Delay is 1 sec, State DR, Priority 1

      Designated Router (ID) 192.168.2.2

         Interface Address fe80::203:fff:fe01:257c

      Backup Designated Router (ID) 192.168.2.3

         Interface Address fe80::203:fff:fe01:d28

      Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5

         Hello due in 00:00:10

      Neighbor Count is 1, Adjacent neighbor count is 1

Vlan2 is up, line protocol is up

   Interface ID 2004

   IPv6 Prefixes

      fe80::203:fff:fe01:257c/64 (Link-Local Address)

      2000:1:1::1/64

   OSPFv3 Process (*null*), Area 0.0.0.0, Instance ID 0

      Router ID 192.168.2.2, Network Type BROADCAST, Cost: 10

      Transmit Delay is 1 sec, State Backup, Priority 1

      Designated Router (ID) 192.168.2.1

         Interface Address fe80::203:fff:fe01:429e

Backup Designated Router (ID) 192.168.2.2

    Interface Address fe80::203:fff:fe01:257c

Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5

    Hello due in 00:00:10

Neighbor Count is 1, Adjacent neighbor count is 1

Displayed information	Explanations
Vlan1 is up, line protocol is up	Let the interface up both logically and physically

IPv6 Prefixes
    fe80::203:fff:fe01:257c/64   (Link-Local Address)
    2001:1:1::1/64
	IPv6 address of the interface and the length of the prefix

OSPFv3 Process (*null*)	Ospfv3 process the interface belongs
Area 0.0.0.1	Area the interface belongs
Instance ID 0	Instance ID is 0
Router ID 192.168.2.2, Network Type BROADCAST, Cost: 10	Process ID; Router ID; Network Type; Cost
Transmit Delay is 1 sec, State DR, Priority 1	LAS transmission delay on the interface; state; electing the priority of the layer 3 switch.
Designated Router (ID) 192.168.2.2 Interface Address fe80::203:fff:fe01:257c	Specifying layer 3 switch
Backup Designated Router (ID) 192.168.2.3 Interface Address fe80::203:fff:fe01:d28	Back up designated layer 3 switch
Timer interval configured, Hello 10, Dead 40, Wait 40, Retransmit 5 Hello due in 00:00:10	OSPF protocol timer; including hello packet, poll interval packets, router dead, router retransmission.
Neighbor Count is 1, Adjacent neighbor count is 1	Numbers of the adjacent layer 3 switch; number of the layer 3 switches established with neighbor relation

6.33 show ipv6 ospf neighbor

Command: show ipv6 ospf [*<tag>*] neighbor [*<neighbor_id>* | <ifname> detail | detail]

Function: Show OSPF adjacent point messages.

Parameter: *<tag>* is process tag, which is a character string

            <neighbor_id> is the neighbor ID shown in IPv4 address format

            detail: Show neighbor details

            <ifname> name of the interface

Default: Not displayed

Command Mode: All modes

Usage Guide: OSPF neighbor state can be checked by viewing the output of this command.

Example:

Switch#show ipv6 ospf neighbor

OSPFv3 Process (*null*)

Neighbor ID	Pri	State	Dead Time	Interface	Instance ID	
192.168.2.3	1	Full/Backup	00:00:29	Vlan1	0	
192.168.2.1	1	Full/DR	00:00:38	Vlan2	0	Vlan1

Displayed information	Explanation
Neighbor ID	Neighbor ID
Instance ID	Instance ID
Address	IP address of neighboring layer 3 switch
Interface	Interface the neighbor belongs
State	Neighbor relationship state
Pri	Priority

6.34 show ipv6 ospf route

Command: show ipv6 ospf [<tag>] route

Function: Show the OSPF route table messages.

Parameter: **<tag>** is the processes tag, which is a character string.

Default: Not displayed

Command Mode: All modes

Example:

Switch#show ipv6 ospf route

Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area

      E1 - OSPF external type 1, E2 - OSPF external type 2

   Destination   Metric

     Next-hop

O   2000:1:1::/64   10

     directly connected, Vlan2

O   2001:1:1::/64   10

directly connected, Vlan1

O 3000:1:1::/64   20

via fe80::203:fff:fe01:429e, Vlan2

O 3003:1:1::/64   20

via fe80::203:fff:fe01:d28, Vlan1

6.35 show ipv6 ospf redistribute

Command: show ip ospf v6 [<*process-tag*>] redistribute

Function: To display the routing message redistributed from external process of OSPF.

Parameter: IPv6 OSPF is the tag ID, to display all routing messages redistributed from external process of IPv6 OSPF if there is no parameter.

Default: None.

Command Mode: Admin Mode and Configuration Mode.

Usage Guide: None.

Example:

Switch#show ipv6 ospf redistribute

ospf process abc redistribute information：

ospf process def

bgp

ospf process def redistribute information：

ospf process abc

Switch#show ipv6 ospf abc redistribute

ospf process abc redistribute information：

ospf process def

bgp

6.36 show ipv6 ospf topology

Command: show ipv6 ospf [<*tag*>] topology [area <*area-id*>]

Function: Show messages of OSPF topology.

Parameter: <*tag*> is the processes tag, which is a character string.

<*area-id*> is an area ID which could be shown in digits ranging between 0 ~

4294967295, or an IPv4 address.

Default: Not displayed.

Command Mode: All modes

Example:

Switch#show ipv6 ospf topology

OSPFv3 Process (*null*)

OSPFv3 paths to Area (0.0.0.0) routers

Router ID	Bits	Metric	Next-Hop	Interface
192.168.2.1		10	192.168.2.1	Vlan2
192.168.2.2		--		
192.168.2.3		10	192.168.2.3	Vlan1

6.37 show ipv6 ospf virtual-links

Command: show ipv6 ospf [*<tag>*] virtual-links

Function: Show OSPF virtual link messages.

Parameter: *<tag>* is the processes tag, which is a character string.

Default: Not displayed.

Command Mode: All modes

Example:

Switch#show ipv6 ospf virtual-links

Virtual Link VLINK1 to router 5.6.7.8 is up

Transit area 0.0.0.1 via interface Vlan1, instance ID 0

Local address 3ffe:1234:1::1/128

Remote address 3ffe:5678:3::1/128

Transmit Delay is 1 sec, State Point-To-Point,

Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5

Hello due in 00:00:01

Adjacency state Up

6.38 show ipv6 route process-detail

Command: show ipv6 route [database] process-detail

Function: Display the IP routing table with specific process ID or Tag.

Parameters: The parameter of database means displaying all the routers, no parameter means only displaying effective routers.

Command Mode: Admin mode and configure mode.

Usage Guide: None.

Example:

Switch#show ipv6 route database process-detail

IPv6 Routing Table

Codes: K - kernel route, C - connected, S - static, R - RIP, O - OSPF,

      I - IS-IS, B - BGP

      > - selected route, * - FIB route, p - stale info

Timers: Uptime

C*> ::1/128 via ::, Loopback, 00:29:53

O   2001::/64 [110/10] via ::, Vlan1, 00:01:07 ,process aaa

C*> 2001::/64 via ::, Vlan1, 00:02:54

O*> 2006::/64 [110/10] via ::, Vlan1, 00:01:07, process aaa

O*> 2008::/64 [110/20] via fe80::203:fff:fe01:2542, Vlan1, 00:00:54, process bbb

6.39 timers spf

Command: timers spf *<spf-delay> <spf-holdtime>*

        no timers spf

Function: Adjust route calculation timer value. The "**no timers spf**" restores the relevant value to default.

Parameter: *<spf-delay>* 5 seconds by default

       <spf-holdtime> 10 seconds by default

Command Mode: OSPFv3 protocol mode

Usage Guide: In this command the delay time between receiving topology change and SPF calculation, and further configured the hold time between two discontinuous SPF calculations.

Example: Switch#config terminal

       Switch(config)#router ipv6 ospf

       Switch(config-router)#timers spf 5 10

Chapter 7 Commands for BGP and MBGP4+

7.1 address-family

Command: address-family <AFI> <SAFI>

Function: Enter address-family mode.

Parameter: <AFI> address-family, such as IPv4, IPv6, VPNv4, etc;

        <SAFI>: sub address-family, such as unicast, multicast, VRF

Default: None.

Command Mode: BGP routing mode

Usage Guide: Since the BGP-4 supports multi-protocol, it is available to get different configuration for each address-family. Actually the configuration outside address-family mode is configuring the default address-family (normally IPv4 unicast). To configure non default mode, enter this address-family mode.

If support MCE, VRF has to be enabled and connected with the corresponding address-family. Configuration performed with this command to specific VRF, is independent from IPv4 unicast address-family. The VRF configuration is performed by using ip vrf <NAME> command under global mode. The address-family configuration is only available after the VRF is set.

If support MPLS VPN, VRF has to be enabled on the border routers; to realize VPN, create neighbors for BGP with the VRF address family on the private network, and with VPNv4 address-family on the public network. When configuring VPNv4 address-family with this command, IPv4 unicast address connection is available. Its neighbor configuration could be the same with IPv4 unicast only by using neighbor A.B.C.D activate on this neighbor to enable this address-family.

Example:

1) Enter IPv4 unicast address-family mode.

Switch(config-router)# address-family ipv4 unicast

2) In the example below a VRF name test is created, and then enter the BGP address-family for its configuration.

Switch(config)#ip vrf test

Switch(config-vrf)#exit

Switch(config)#router bgp 100

Switch(config-router)#address-family ipv4 vrf test

Switch(config-router-af)#

3) Enter BGP VPNv4 address-family mode.

Switch(config)#router bgp 100

Switch(config-router)#address-family vpnv4

Switch(config-router-af)#

Related Command: exit-address-family

7.2 aggregate-address

Command: aggregate-address *<ip-address/M>* [summary-only] [as-set]

　　　　　　no aggregate-address *<ip-address/M>* [summary-only] [as-set]

Function: Configure the aggregate-address. The "**no aggregate-address *<ip-address/M>* [summary-only] [as-set]**" command deletes the aggregate-address.

Parameter: *<ip-address/M>*: IP address, length of mask.

　　　　　　[summary-only]: Send summary only ignoring specific route.

　　　　　　[as-set]: Show AS on the path in list, each AS is shown once.

Default: No aggregate configuration.

Command Mode: BGP route mode, VRF address family mode

Usage Guide: Address aggregation reduces spreading routing messages outside. Use summary-only option so to spread aggregate route to the neighbors without spreading specific route. as-set option will list AS from each route covered by the aggregation only once without repeat.

Example:

Switch(config-router)#aggregate-address 100.1.0.0/16 summary-only

Switch(config-router)#aggregate-address 100.2.0.0/16 summary-only as-set

Switch(config-router)#aggregate-address 100.3.0.0/16 as-set

Related Command: bgp aggregate-nexthop-check, no bgp aggregate-nexthop-check

7.3 bgp aggregate-nexthop-check

Command: bgp aggregate-nexthop-check

　　　　　　no bgp aggregate-nexthop-check

Function: Configures whether BGP checks all the route next-hop in aggregating. The "**no bgp aggregate-nexthop-check**" command cancels this configuration, namely not check the next-hop accordance of aggregate route.

Parameter: None.

Default: No nexthop checked during aggregating.

Command Mode: Global mode

Usage Guide: When check is enabled, the aggregate will not be performed if the next-hop of the covered routes are not in accordance. When checking is disabled, all covered route will be aggregated into the aggregate route.

Example:

Switch(config)#bgp aggregate-nexthop-check

Relevant Command: aggregate-address, no aggregate-address

7.4 bgp always-compare-med

Command: bgp always-compare-med

         no bgp always-compare-med

Function: Configures If MED comparation is always performed. The "**no bgp always-compare-med**" command cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Normally the BGP compares the MED only when the AS is the same. By using this configuration, MED of routes from different AS source will also be compared.

Example: The AS (200) receives the same route prefix form the two AS (100 and 300) carrying different MED, configure the MED comparison is always performed.

Switch(config-router)#bgp always-compare-med

7.5 bgp asnotation asdot

Command: bgp asnotation asdot

          no bgp asnotation asdot

Function: Show AS number and match the regular expression with ASDOT method. The no command cancels this method.

Parameter: None.

Default: ASPLAIN method.

Command mode: BGP route mode

Usage Guide: To change the method that show AS number and match the regular expression, it must configure "clear ip bgp *" to rebuild all BGP neighbor relationships after this command is configured.

Example: Show AS number and match the regular expression with ASDOT method.

Switch(config)#router bgp 200

Switch(config-router)#bgp asnotation asdot

Related Command: None.

7.6 bgp bestpath as-path ignore

Command: bgp bestpath as-path ignore

                no bgp bestpath as-path ignore

Function: Set to ignore the AS-PATH length. The "**no bgp bestpath as-path ignore**" command cancels this configuration.

Parameter: None.

Default: Not set.

Command Mode: BGP route mode

Usage Guide: Length of AS-PATH will be compared in BGP pathing, and its length can be ignored by using this configuration.

Example:

  Set to ignore the AS-PATH length:

Switch(config)#router bgp 200

Switch(config-router)#bgp bestpath as-path ignore

Related Command: bgp bestpath compare-confed-aspath, bgp bestpath compare-routerid, bgp bestpath med, no bgp bestpath compare-confed-aspath, no bgp bestpath compare-routerid, no bgp bestpath med

7.7 bgp bestpath compare-confed-aspath

Command: bgp bestpath compare-confed-aspath

                no bgp bestpath compare-confed-aspath

Function: Set to concern the confederation AS-PATH length. The "**no bgp bestpath compare-confed-aspath**" command cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Normally only the length of external AS-PATH will be compared in BGP pathing. By using this configuration, lengths of AS inner confederation AS-PATH will be compared at the same time.

Example: Configure confederation AS-PATH length.

Switch(config-router)#bgp bestpath compare-confed-aspath

7.8 bgp bestpath compare-routerid

Command: bgp bestpath compare-routerid

           no bgp bestpath compare-routerid

Function: Compare route ID; the "**no bgp bestpath compare-routerid**" command cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Normally the first arrived route from the same AS (with other conditions equal) will be chosen as the best route. By using this command, source router ID will also be compared.

Example: Device (10.1.1.66, AS200) receives the same route prefix from two devices (10.1.1.64 and 10.1.1.68) of the same AS (100), configure the device to compare route ID.

Switch(config-router)#bgp bestpath compare-routerid

Related Command: bgp bestpath compare-confed-aspath, bgp bestpath compare-confed-aspath, bgp bestpath med, no bgp bestpath compare-confed-aspath, no bgp bestpath compare-confed-aspath, no bgp bestpath med

7.9 bgp bestpath med

Command: bgp bestpath med {[confed] [missing-as-worst]}

           no bgp bestpath med {[confed] [missing-as-worst]}

Function: Configure to compare the MED attributes in the confederation path and to consider the value is the largest when MED is unavailable . The "**no bgp bestpath med {[confed] [missing-as-worst]}**" command cancels this configuration.

Parameter: [confed]: Compare MED in the confederation path.

           [missing-is-worst]: Consider as max MED value when missing.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Choose whether MED is compared among confederations by this command. If MED is missing, it is considered max when missing-is-worst or else 0.

Example: Configure to compare the MED attributes in the confederation path and to consider the value is the largest when MED is unavailable.

Switch(config-router)#bgp bestpath med confed missing-as-worst

Relevant Commands: bgp bestpath compare-confed-aspath, bgp bestpath

compare-confed-aspath, bgp bestpath compare-routerid, no bgp bestpath compare-confed-aspath, no bgp bestpath compare-confed-aspath, no bgp bestpath compare-routerid

7.10 bgp client-to-client reflection

Command: bgp client-to-client reflection
            no bgp client-to-client reflection
Function: Configures whether the route reflection is performed. The "**no bgp client-to-client reflection**" cancels this configuration.
Parameter: None.
Default: Reflection defaulted when client is configured.
Command Mode: BGP route mode
Usage Guide: After configured reflection client with neighbor {<ip-address>|<TAG>} route-reflector-client, the router performs routing reflection in default condition. The NO form of this command cancels the route reflection among CLIENT, (reflection among Clients and non-CLIENT is not disturbed).
Example: Configure to cancel the route reflection.
Switch(config-router)#no bgp client-to-client reflection
Relevant Commands: neighbor route-reflector-client, no neighbor route-reflector-client

7.11 bgp cluster-id

Command: bgp cluster-id {<*ip-address*>|<*01-4294967295*>}
            no bgp cluster-id {[<*ip-address*>]|<*0-4294967295*>}
Function: Configure the route reflection ID during the route reflection. The "**no bgp cluster-id {[<*ip-address*>]|<*0-4294967295*>}**" command cancels this configuration.
Parameter: <*ip-address*>|<*1-4294967295*>: cluster-id which is shown in dotted decimal notation or a 32 digit number.
Default: Not configured.
Command Mode: BGP route mode
Usage Guide: A cluster consists of one routing reflector and its clients in an area. However in order to increase the redundancy level, sometime more than one routing reflectors may be deployed in one area. Router-id is for identifying the router exclusively in an area, and cluster-id is required for two or more reflector identification.
Example: Configure the route reflection cluster-id is 1.1.1.1.

Switch(config-router)#bgp cluster-id 1.1.1.1
Related Command: neighbor route-reflector-client

7.12 bgp confederation identifier

Command: bgp confederation identifier *<as-id>*

                no bgp confederation identifier [*<as-id>*]

Function: Create a confederation configuration. The "**no bgp confederation identifier [*<as-id>*]**" command deletes a confederation.

Parameter: *<as-id>*: ID number of the confederation AS, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100).

Default: No confederation.

Command Mode: BGP route mode

Usage Guide: Confederation is for divide large AS into several smaller AS, while still identified as the large AS. Create large AS number with this command.

Example:

Switch(config-router)# bgp confederation identifier 600

Related Command: bgp confederation peers, no bgp confederation peers

7.13 bgp confederation peers

Command: bgp confederation peers <as-id> [<as-id>..]

                no bgp confederation peers *<as-id>* [*<as-id>*..]

Function: Add/delete one or several AS to a confederation.

Parameter: *<as-id>*: ID numbers of the AS included in the confederation, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100), which could be multiple.

Default: No members.

Command Mode: BGP route mode.

Usage Guide: Confederation is for divide large AS into several smaller AS, while still identified as the large AS. Use this command to add/delete confederation members.

Example: Create a confederation, ID is 600, add 100, 200, 100.300 members.

Switch(config-router)# bgp confederation identifier 600

Switch(config-router)#bgp confederation peers 100 200 100.300

7.14 bgp dampening

Command: bgp dampening [*<1-45>*] [*<1-20000> <1-20000> <1-255>*] [*<1-45>*]
      no bgp dampening

Function: Configure the route dampening.The "**no bgp dampening**" command cancels the route dampening function.

Parameter: *<1-45>*: Respectively the penalty half-lives of accessible and inaccessible route, namely the penalty value is reduced to half of the previous value, in minutes.

      <1-20000>: Respectively the penalty reuse border and restrain border.

      <1-255>: Maximum restrain route time, in minutes.

Default: Half-life of accessible route is 15 minutes, 15 minutes for inaccessible. The restrain border is 2000, reuse border is 750, and maximum restrain time is 60 minutes.

Command Mode: BGP Route Mode.

Usage Guide: Abundant route update due to unstable route could be reduced with route dampening technology, of which the algorithm is lay penalty on the route when the route fluctuates, and when penalty exceeds the restrain border this route will no longer be advertised. The penalty value will be reduced by time by the half-life index regulation if the route keeps stable and finally be advertised again when the penalty falls below the border or the restrain time exceeds the maximum restrain time. This command is for enabling/disabling the route dampening and configuring its parameters.

Example: Enable the route dampening and use the parameter configuration by default.

Switch(config-router)# bgp dampening

7.15 bgp default

Command: bgp default {ipv4-unicast|local-preference *<0-4294967295>*}
      no bgp default   {ipv4-unicast|local-preference [*<0-4294967295>*]}

Function: Set the BGP defaults, the "**no bgp default {ipv4-unicast|local-preference [*<0-4294967295>*]}**" command cancels this configuration.

Parameter: ipv4-unicast: Configure the default using IPv4-unicast to set up neighbor connection.

      local-preference*<0-4294967295>*: Configure the default local priority.

Default: The IPv4 unicast is default enabled when BGP is enabled. The default priority is 100.

Command Mode: BGP route mode.

Usage Guide: IPv4 unicast address-family is default enabled in BGP. Cancel this setting with no bgp default ipv4-unicast command so to not enable this address-family in default.

Default local priority can be configured through bgp default local-preference command.

Example: Configure the default local priority to be 500.

Configure in 10.1.1.66:

Switch(config)#router bgp 200

Switch(config-router)# bgp default local-preference 500

7.16 bgp deterministic-med

Command: bgp deterministic-med

            no bgp deterministic-med

Function: Use the best MED for the same prefix in the AS to compare with other AS. The "**no bgp deterministic-med**" cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Normally if same prefix routes from several paths, each path will be compared. With this configuration, the system will only use the path with the smallest MED in the AS (when other main attributes equal) to compare with other AS. After the best one is elected, select the path among AS with no regard to MED value.

Example: Set BGP to use the best MED for the same prefix in the AS to compare with other AS.

Switch(config-router)#bgp deterministic-med

7.17 bgp enforce-first-as

Command: bgp enforce-first-as

            no bgp enforce-first-as

Function: Enforces the first AS position of the route AS-PATH contain the neighbor AS number or else disconnect this peer when the BGP is reviving the external routes. The "**no bgp enforce-first-as**" command cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: This command is usually for avoiding unsafe or unauthenticated routes.

Example:

Switch(config-router)#bgp enforce-first-as

7.18 bgp fast-external-failover

Command: bgp fast-external-failover
              no bgp fast-external-failover
Function: Fast reset when the BGP neighbor connection varies at the interface other than wait for TCP timeout. The "**no bgp fast-external-failover**" command cancels this configuration.
Parameter: None.
Default: Configured.
Command Mode: BGP route mode
Usage Guide: This command is for immediately cutting of the neighbor connection when the interface is down.
Example:
Switch(config-router)# bgp fast-external-failover

7.19 bgp inbound-route-filter

Command: bgp inbound-route-filter
              no bgp inbound-route-filter
Function: The bgp do not install the RD routing message which does not exist locally. The no command means the RD will be installed with no regard to the local existence of the RD.
Parameter: None.
Command Mode: BGP mode.
Usage Guide: Normally when the switch plays as PE, whether the route bgp acquired from VPN is saved in BGP depends on if the VRF configured in this PE has got matched information. With the no command the BGP will save the routing message with no regard to the matched information.
Example:
Switch(config)#router bgp 100
Switch(config-router)#no bgp inbound-route-filter

7.20 bgp inbound-max-route-num

Command: bgp inbound-max-route-num <0-500000>
              no bgp inbound-max-route-num

Function: Set the number limit of routers learnt by the bgp process from its neighbors.

Parameters: The number limit of routers, ranging from 0 to 500000.

Default: The number limit is 50000 by default.

Command Mode: BGP routing mode and address family mode

Usage Guide: Limit the number of routers learnt by the bgp process from its neighbors with this command.

Example: The following configuration will limit max number of routers that the bgp process receives from its neighbors as 20000.

Switch(config-router)# bgp inbound-max-route-num 20000

7.21 bgp log-neighbor-changes

Command: bgp log-neighbor-changes

no bgp log-neighbor-changes

Function: Output log message when BGP neighbor changes. The "**no bgp log-neighbor-changes**" command cancels this configuration.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Can display neighbor change messages on the monitor.

Example:

Switch(config-router)# bgp log-neighbor-changes

7.22 bgp network import-check

Command: bgp network import-check

no bgp network import-check

Function: Set whether check the IGP accessibility of the BGP network route or not. The "**no bgp network import-check**" command sets to not checking the IGP accessibility.

Parameter: None.

Default: Not configured.

Command Mode: BGP route mode

Usage Guide: Checking the IGP accessibility of the route advertised by BGP is to check the existence of next-hop and its IGP accessibility.

Example: Set to check the IGP accessibility of BGP network route.

Switch(config-router)# bgp network import-check

7.23 bgp rfc1771-path-select

Command: bgp rfc1771-path-select

            no bgp rfc1771-path-select

Function: After this attribute is set, path selecting will follow the way defined in rfc 1771, namely not checking the AS internal metric, or comparing the internal METRIC.

Parameter: None.

Default: Following

Command Mode: Global mode

Usage Guide: After this attribute is set, path selecting will follow the way defined in rfc 1771, namely not checking the AS internal metric, when different AS exist, which should be perform without this attribute set.

Example: Configure to follow the rfc1771 path selecting.

Switch(config)# bgp rfc1771-path-select

7.24 bgp rfc1771-strict

Command: bgp rfc1771-strict

            no bgp rfc1771-strict

Function: Set   whether   strictly   follows   the   rfc1771   restrictions.   The   "**no bgp rfc1771-strict**" command set to not strictly following.

Parameter: None.

Default: Not following rfc 1771 restrictions.

Command Mode: Global mode

Usage Guide: With this attribute set, generation types of routes from protocols such as RIP, OSPF, ISIS, etc will be regarded as IGP (internal generated), or else as incomplete.

Example: Configure to stricly follow the rfc1771 restrictions.

Switch(config)#bgp rfc1771-strict

7.25 bgp router-id

Command: bgp router-id <A.B.C.D>

            no bgp router-id [<A.B.C.D>]

Function: Configure the router ID manually. The no operation cancels this configuration.

Parameter: <A.B.C.D>: Router ID.

Default: Automatically acquire router ID.

Command Mode: BGP route mode

Usage Guide: Manually set the router ID with this command.

Example: Set the Router ID to be 1.1.1.1.

Switch(config-router)# bgp router-id 1.1.1.1

7.26 bgp scan-time

Command: bgp scan-time *<0-60>*

　　　　no bgp scan-time [*<0-60>*]

Function: Set the time interval of the periodical next-hop validation; the "**no bgp scan-time [*<0-60>*]**" command restores to the default value.

Parameter: *<0-60>*: Validation time interval.

Default: Default interval is 60s.

Command Mode: BGP route mode

Usage Guide: Validate the next-hop of BGP route, this command is for configuring the interval of this check. Set the parameter to 0 if you don't want to check.

Example: Set the time interval of periodical next-hop validation to be 30s.

Switch(config-router)# bgp scan-time 30

7.27 clear ip bgp

Command: clear ip bgp * [*vrf* <vrf-name>] [*in | out* | soft [*in | out*]]

Function*:* Reboot the connection between BGP of vrf-name and all peers.

Parameter: *<vrf-name>*: Configure the instance name of VPN, the ranging from 1 to 64;

　　　　in: The in soft configuration is updated;

　　　　out: The out soft configuratin is updated;

　　　　soft: The soft reboot.

Default: None.

Command Mode: Admin mode

Usage Guide: Reboot BGP when configuring clear ip bgp * command; send the requestment message to neighbor when configuring in parameter; sent the route to neighbor when configuring out parameter. If configure soft, BGP will not be reseted.

Example:

Switch#clear ip bgp * vrf VRF-A

Switch#

7.28 clear ip bgp dampening

Command: **clear** **ip** **bgp** **[<*address-family*>]** **dampening** **[<ip-address>|<ip-address/M>]**

Function: Used for resetting BGP routing dampening.

Parameter: **<*address-family*>:** address-family, such as "ipv4 unicast".

         <*ip-address*>: IP address.

         <*ip-address/M*>: IP address and mask.

Default: None.

Command Mode: Admin mode

Usage Guide: It is possible to clear BGP routing dampening messages and state by different parameters (such as address-family or IPv4 address).

Example: Clear BGP routing dampening and state of IPv4 unicast cluster.

Switch#clear ip bgp ipv4 unicast dampening

Related Command: bgp dampening

7.29 clear ip bgp flap-statistics

Command: **clear** **ip** **bgp** **[<*address-family*>]** **flap-statistics** **[<*ip-address*>|<*ip-address/M*>]**

Function: For resetting BGP routing dampening statistics messages.

Parameter: **<*address-family* >:** address-family such as "ipv4 unicast".

         <*ip-address*>: IP address.

         <*ip-address/M*>: IP address and mask.

Default: None.

Command Mode: Admin mode.

Usage Guide: It is possible to clear BGP routing dampening statistic messages and state by different parameters (such as address-family or IPv4 address).

Example: Clear the BGP dampening statistic messages of IPv4 unicast cluster.

Switch#clear ip bgp ipv4 unicast flap-statistics

7.30 debug bgp

Command: debug bgp [<*MODULE*>|all]

         no debug bgp [<*MODULE*>|all]

Function: For BGP debugging. The "**no debug bgp [<*MODULE*>|all]**" command closes the BGP debugging messages

Parameter: <*MODULE*>: BGP module names, including dampening、events、filters、fsm、

keepalives、nsm、updates, etc.

Default: None

Command Mode: Admin mode

Usage Guide: For monitoring BGP events and the encountered errors, warning messages.

Example: Display the debugging messages of all bgp modules.

Switch#debug bgp all

7.31 debug bgp redistribute message send

Command: debug bgp redistribute message send

            no debug bgp redistribute message send

Function: To enable debugging switch of sending messages for redistribution of routing information from external process such as OSPF and RIP to BGP. The no command will disable the debugging switch.

Parameter: None.

Default: Close the debug by default.

Command Mode: Admin Mode.

Usage Guide: None.

Example:

Switch# debug bgp redistribute message send

Switch# no debug bgp redistribute message send

7.32 debug bgp redistribute route receive

Command: debug bgp redistribute route receive

            no debug bgp redistribute route receive

Function: To enable debugging switch of received messages from NSM for BGP. The no form of this command will disable debugging switch of received messages from NSM for BGP.

Parameter: None.

Default: Close the debug by default.

Command Mode: Admin Mode.

Usage Guide: None.

Example:

Switch#debug bgp redistribute route receive

Switch#no debug bgp redistribute route receive

7.33 debug ipv6 bgp redistribute message send

Command: debug ipv6 bgp redistribute message send

          no debug ipv6 bgp redistribute message send

Function: To enable debugging switch of sending messages for redistribution of routing information from external process such as OSPFv3 and others to MBGP4+. The no 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 bgp redistribute message send

7.34 debug ipv6 bgp redistribute route receive

Command: debug ipv6 bgp redistribute route receive

          no debug ipv6 bgp redistribute route receive

Function: To enable debugging switch of received messages from NSM for MBGP4+. The no form of this command will disable debugging switch of received messages from NSM for MBGP4+.

Parameter: None.

Default: Close the debug by default.

Command Mode: Admin Mode.

Usage Guide: None.

Example:

Switch# debug ipv6 bgp redistribute route receive

Switch# no debug ipv6 bgp redistribute route receive

7.35 distance

Command: distance <1-255> <ip-address/M> [<WORD>]

          no distance *<1-255> <ip-address/M> [<WORD>]*

Function: Set the manage distance of the routing prefix. The "**no distance *<1-255>***

<ip-address/M> **[*<WORD>*]**" command restores to the default value.

Parameter: *<1-255>*: Manage distance.

   <ip-address/M>: Routing prefix.

   <WORD>: Access-list name.

Default: Not set.

Command Mode: BGP route mode

Usage Guide: Set the manage distance for specified BGP route as the path selecting basis.

Example: Set the manage distance for route 90 10.1.1.64/32 to be 90.

Switch(config-router)# distance 90 10.1.1.64/32

7.36 distance bgp

Command: distance bgp *<1-255> <1-255> <1-255>*

   no distance bgp [*<1-255> <1-255> <1-255>*]

Function: Set the BGP protocol management distance. The "**no distance bgp [*<1-255> <1-255> <1-255>*]**" command restores the manage distance to default value.

Parameter: *<1-255>* Respectively the EBGP, IBGP and LOCAL manage distance of the BGP.

Default: Default EBGP is 20, others are 200.

Command Mode: BGP route mode

Usage Guide: Set the manage distance for BGP routing as the NSM path selecting basis.

Example: Set the manage distance for BGP routing as 15, the manage distance for IBGP and local routing as 150.

Switch(config-router)# distance bgp 15 150 150

7.37 exit-address-family

Command: exit-address-family

Function: Exit the BGP address-family mode.

Parameter: None.

Default: None.

Command Mode: BGP address-family mode

Usage Guide: Use this command to exit the mode so to end the address-family configuration when configuring address-family under BGP.

Example:

Switch(config)#router bgp 100

Switch(config-router)#address-family ipv4 unicast

Switch(config-router-af)# exit-address-family

Switch(config-router)#

Related Command: address-family

7.38 import map

  Command: import map <map-name>

           no import map <*map-name*>

Function: Use this command to configure the route-map regulations when introducing routes into VRF.

Parameter: <*map-name*> is the route-map name used.

Default: None.

Command Mode: VRF mode.

Usage Guide: Use the route map command route-map NAME permit|deny <1-65535> to create the route-map and establish the regulations. Using this command will apply regulations to the route introducing of this VRF.

Example: This example configures a route map1, then configures VRF test to use the route map.

Switch(config)#route-map map1 permit 15

Switch(config-map)#match interface Vlan1

Switch(config-map)#set weight 655

Reconfiguring VRF test with this route-map

Switch(config-map)#exit

Switch(config)#ip vrf test

Switch(config-af)#rd 100:10

Switch(config-af)#route-target both 100:10

Switch(config-af)#import map map1

Switch#show ip bgp vpn all

Network	Next Hop	Metric	LocPrf	Weight Path
Route Distinguisher: 100:10 (Default for VRF test)				
*> 11.1.1.0/24	11.1.1.64	0		0 200 ?
*>i15.1.1.0/24	10.1.1.68	0	100	655 300 ?
*> 20.1.1.0/24	11.1.1.64	0		0 200 ?
*>i100.1.1.0/24	10.1.1.68	0	100	655 300 ?
Route Distinguisher: 100:10				
*>i15.1.1.0/24	10.1.1.68	0	100	0 300 ?
*>i100.1.1.0/24	10.1.1.68	0	100	0 300 ?

As we can see, the weight of the route from the VPN changes to 655 after introduced into VRF test.

7.39 ip as-path access-list

Command: ip as-path access-list <.LINE> {<permit>|<deny>} <LINE>

           no ip as-path access-list *<.LINE>* **{***<permit>|<deny>***}** *<LINE>*

Function: Configure the AS-PATH access-list. The "**no ip as-path access-list** *<.LINE>* **{***<permit>|<deny>***}** *<LINE>*" command deletes this access-list.

Parameter: *<.LINE>*: name of access-list.

           <LINE>: matched strings in the AS-PATH.

Default: None.

Command Mode: Global mode.

Usage Guide: Use this command to configure the access-list related to AS-PATH, so to supply the conditions for pass/filter.

Example: Configure the access-list named ASPF, filter the AS-PATH contained route 100.

Switch(config)#ip as-path access-list ASPF deny ^100$

7.40 ip community-list

Command: ip community-list {*<LISTNAME>* **|** *<1-199>* **| [expanded** *<WORD>***] | [standard** *<WORD>***]} {deny | permit}** *<.COMMUNITY>*

           no ip community-list {*<LISTNAME>* **|** *<1-199>* **| [expanded** *<WORD>***] | [standard** *<WORD>***]} [{deny | permit}** *<.COMMUNITY>***]**

Function: Configure the community-list. The "**no ip community-list {***<LISTNAME>|<1-199>***][expanded** *<WORD>***]|[standard** *<WORD>***]} [{deny|permit}** *<.COMMUNITY>***]**" command deletes the community list.

Parameter: *<LISTNAME>*: name of community list.

           <1-199>: Standard or extended community number.

           <WORD>: Standard or extended community number.

           <.COMMUNITY >: Members of the community list, which may be the combination of aa:nn, or internet, local-AS, no-advertise, and no-export. It can be shown in regular expressions under extended conditions.

Default: None.

Command Mode: Global mode

Usage Guide: With this command we can configure the community-list so to supply terms for the pass/filter/search.

Example: Configure the ip community-list named LN, permit community attribute as 100:10.

Switch(config)# ip community-list LN permit 100:10

7.41 ip extcommunity-list

Command: **ip** **extcommunity-list** **{<*LISTNAME*>|<*1-199*>|[expanded** **<*WORD*>]|[standard <*WORD*>]} {deny|permit} <.*COMMUNITY*>**

        no **ip** **extcommunity-list** **{<*LISTNAME*>|<*1-199*>|[expanded** **<*WORD*>]|[standard <*WORD*>]} {deny|permit} <.*COMMUNITY*>**

Function: Configure the extended community-list. The "**no ip extcommunity-list {<*LISTNAME*>|<*1-199*>|[expanded <*WORD*>]|[standard <*WORD*>]} {deny|permit} <.*COMMUNITY*>**" command is for deleting the extended community list.

Parameter: **<*LISTNAME*>**:   name of community-list.

        <*1-199*>: Standard or extended community number.

        <*WORD*>: Standard or extended community number.

        <.*COMMUNITY* >: Members of the community list, which may be the combination of aa:nn, or internet, local-AS, no-advertise, and no-export. It can be shown in regular expressions under extended conditions.

Default: None.

Command Mode: Global mode

Usage Guide: With this command we can configure the community-list so to supply terms for the pass/filter/search.

Example: Configure the excommunity-list named LN, permit community attribute as 100:10.

Switch(config)# ip extcommunity-list LN permit 100:10

7.42 neighbor activate

Command: neighbor {<*ip-address*>|<*TAG*>} activate

        no neighbor {<*ip-address*>|<*TAG*>} activate

Function: Configure the address family routing which do or do not switch specific address-family with BGP neighbors. The "**no neighbor {<*ip-address*>|<*TAG*>} activate**" command is for setting the route which do not switch the specified address family.

Parameter: **<*ip-address*>**: IP address of the neighbor.

        <*TAG*>: Name of peer group.

Default: Enable the routing switch of IP unicast address-family, and disable other

address-families.

Command Mode: BGP route mode and address-family mode

Usage Guide: IP unicast is configured under BGP route mode. Configure whether specific address-family is switched under address-family mode. If this option on any side between local side and partner is not enabled, the address-family route will not be acquired by the partner even if the corresponding address family routes acquired before will be cancelled after this option is disabled.

Example: Configure to exchange the unicast route with neighbor 2002::2.

Switch(config-router)#neighbor 2002::2 activate

Switch(config-router)#address-family ipv4

Switch(config-router-af)#no neighbor 2002::2 activate

Switch(config-router-af)#

7.43 neighbor advertisement-interval

Command: neighbor {*<ip-address>|<TAG>*} advertisement-interval *<0-600>*

        no neighbor {*<ip-address>|<TAG>*} advertisement-interval [*<0-600>*]

Function: Configure the update interval of specific neighbor route. The "**no neighbor {*<ip-address>|<TAG>*} advertisement-interval [*<0-600>*]**" command restores to default.

Parameter: *<ip-address>*: IP address of the neighbor.

        ***<TAG>*:** Name of the peer group.

        ***<0-600>*:** Advertise interval, in seconds.

Default: Default IBGP is 5s, default EBGP is 30s.

Command Mode: BGP route mode and address-family mode

Usage Guide: Reduce this value will improve the route updating speed while also consumes more bandwidth.

Example: Set the route update interval as 20s with neighbor 10.1.1.64.

Switch(config-router)#neighbor 10.1.1.64 advertisement-interval 20

7.44 neighbor allowas-in

Command: neighbor {*<ip-address>|<TAG>*} allowas-in [*<1-10>*]

        no neighbor {*<ip-address>|<TAG>*} allowas-in

Function: Configure the counts same AS is allowed to appear in the neighbor route AS table. The "**no neighbor {*<ip-address>|<TAG>*} allowas-in**" restores to not allow any repeat.

Parameter: *<ip-address>*: IP address of the neighbor.

<TAG>: Name of the peer group.

<1-10>: Allowed count of same AS number.

Default: In default conditions AS is not allowed repeating in the same route, and when set the repeat count it is defaulted at 3 when <1-10> parameters not set.

Command Mode: BGP route mode and address family mode

Usage Guide: Normally BGP will not allow same AS number appears in the route more than one time. The system will deny a route when its AS number appears in the AS-PATH. However to support some special needs, especially the VPN support, the extended BGP allows the AS re-appear counts by configuration. This command is for configure the re-appear counts.

Example: Allow the same AS to appear in the route three times for neighbor 10.1.1.66.

Switch(config-router)#neighbor 10.1.1.66 allowas-in

7.45 neighbor as-override

Command: neighbor {<ip-address> | <TAG>} as-override

  no neighbor {<*ip-address*> | <*TAG*>} as-override

Function: Cover a number of AS path and configure this command before create the neighbor. The no command deletes the configuration.

Parameters: <*ip-address*>: The specific neighbor address.

  <*TAG*>: The specific neighbor number.

Default: None.

Command Mode: VRF address family mode

Usage Guide: After configure this command, the route from the neighbor will cover the existed AS number.

Example:

Switch (config)#router bgp 100

Switch (config-router)#address-family ipv4 vrf VRF-A

Switch(config-router-af)#neighbor 3.0.0.1 remote-as 65001

Switch(config-router-af)# neighbor 3.0.0.1 as-override

Switch(config-router-af)#

7.46 neighbor attribute-unchanged

Command: neighbor {<*ip-address*>|<*TAG*>} attribute-unchanged [as-path] [med] [next-hop]

  no neighbor {<*ip-address*>|<*TAG*>} attribute-unchanged [as-path] [med]

[next-hop]

Function: Configure certain attributes which is kept unchanged for transmitting, namely the attribute transparent transmission. The "**no neighbor {<ip-address>|<TAG>} attribute-unchanged [as-path] [med] [next-hop]**" command means the attribute transparent transmission is not performed.

Parameter: **<ip-address>:** IP address of the neighbor.

　　　　　<TAG>: Name of the peer group.

Default: No attribute transparent defined.

Command Mode: BGP route mode and address-family mode

Usage Guide: With this configuration specified route attributes will not change when transmitted to the specified neighbor. The BGP route mode is the IPv4 unicast address mode configuration. No parameter refers to above three parameter are configured together.

Example: Set the attribute of route as-path, med, next-hop unchanged for neighbor 10.1.1.64.

Switch(config-router)#neighbor 10.1.1.64 attribute-unchanged

7.47 neighbor capability

Command: neighbor {<ip-address>|<TAG>} capability {dynamic | route-refresh}

　　　　　no neighbor {<ip-address>|<TAG>} capability {dynamic | route-refresh}

Function: Configure dynamic update between neighbors and the route refresh capability negotiation. The "**no neighbor {<ip-address>|<TAG>} capability {dynamic | route-refresh}**" command do not enable the specific capability negotiation.

Parameter: **<ip-address>:** Neighbor IP address.

　　　　　<TAG>: Name of peer group.

Default: Not configure the dynamic update capability but the route refresh capability.

Command Mode: BGP route mode and address family mode.

Usage Guide: This is an extended BGP capability. With this configuration supported capabilities by both side will be negotiated in the OPEN messages, and the partner will respond if this capability is supported by the partner and send NOTIFICATION if not. The originating side will then send an OPEN excluded the capability to reestablish the connection. The dynamic capability refers to when the address family negotiation changes, the connection don't have to be restarted. Route refresh refers to sending refresh request when configuring some soft reconfigurable attributes and the partner will retransmit the existing route to the originating side. With route refresh attribute, the connection will not have to be restarted but be refreshed with the clear ip bgp * soft in command.

Example:

Switch(config-router)#neighbor 10.1.1.64 capability dynamic

Switch(config-router)# no neighbor 10.1.1.64 capability route-refresh

7.48 neighbor capability orf prefix-list

Command: neighbor {<ip-address>|<TAG>} capability orf prefix-list {<both>|<send>|<receive>}

no neighbor {<ip-address>|<TAG>} capability orf prefix-list {<both>|<send>|<receive>}

Function: Configure the out route filter capability negotiation between neighbors. The "**no neighbor {<ip-address>|<TAG>} capability orf prefix-list {<both>|<send>|<receive>}**" command set to not perform the negotiation.

Parameter: <ip-address>: Neighbor IP address.

<TAG>: Name of peer group.

Default: ORF capability not configured.

Command Mode: BGP route mode and address-family mode

Usage Guide: This is an extended BGP capability. With this configuration supported capabilities by both side will be negotiated in the OPEN messages, and the partner will respond if this capability is supported by the partner and send NOTIFICATION if not. The originating side will then send an OPEN excluded the capability to reestablish the connection. With this capability, the side configured with in prefix-list filter rules will transmit its own filter rules to the peer, the peer group will apply this rule as its own out rules, so to avoid sending route which will be denied by the partner.

Example: Set to perform the out route filter capability negotiation with neighbor 10.1.1.66.

Switch(config-router)#neighbor 10.1.1.66 capability orf prefix-list both

Relevant Commands: neighbor capability, no neighbor capability

7.49 neighbor collide-established

Command: neighbor {<ip-address>|<TAG>} collide-established

no neighbor {<ip-address>|<TAG>} collide-established

Function: Enable the collision check and settlement in the TCP connection collision. The "**no neighbor {<ip-address>|<TAG>} collide-established**" command disables the TCP connection collision settlement.

Parameter: <ip-address>: Neighbor IP address.

<TAG>: Name of the peer.

Default: Disabled and Unavailable.

Command Mode: route mode and address family mode

Usage Guide: This command is for settling the problem that multi-connection among peers due to TCP connection collision. Connections created with this option on will always be check even at established state. And it will be checked if local side IP is larger than partner IP when collides. If yes, the original connection will be deleted, and if not the option will be configured to only checks when the connection originated from local side at open sent and open confirm state.

Example: Set to perform the TCP connection collision check and settlement with neighbor 10.1.1.64.

Switch(config-router)#neighbor 10.1.1.64 collide-established

7.50 neighbor default-originate

Command: neighbor {*<ip-address>*|*<TAG>*} default-originate [route-map *<WORD>*]

**   no   neighbor   {*<ip-address>*|*<TAG>*}   default-originate   [route-map *<WORD>*]**

Function: Configures whether enables transmitting default route to the specific neighbor. The "**no neighbor {*<ip-address>*|*<TAG>*} default-originate [route-map *<WORD>*]**" command configures not sending default route to neighbors.

Parameter: *<ip-address>*: IP address of the neighbor.

          ***<TAG>*:** Name of the peer.

          ***<WORD>*:** Name of route map.

Default: Not sending default route.

Command Mode: BGP route mode and address-family mode

Usage Guide: With this option, the default route of local side will be transmitted to partner, or else not. It supplies with options of which one to supply the default route. if several neighbors of the partner supply default route, the best one will be elected according to path selecting principles. According to route mirror, it can be chosen when to send the default route.

Example: Set to transmit the local default route to neighbor 10.1.1.64.

Switch(config-router)#neighbor 10.1.1.64 default-originate

Switch(config-router)#

Then the default route from BGP will appear in partner route list.

Relevant Commands: route-map

7.51 neighbor description

Command: neighbor {*<ip-address>*|*<TAG>*} description *<.LINE>*

   no neighbor {*<ip-address>*|*<TAG>*} description

Function: Configure the description string of the peer or peer group. The "**no neighbor {*<ip-address>*|*<TAG>*} description**" command deletes the configurations of this string.

Parameter: *<ip-address>*: Neighbor IP address.

   ***<TAG>*:** Name of peer group.

   ***<.LINE>*:** Description string consists of displayable characters less than 80.

Default: Description string is empty.

Command Mode: BGP route mode and address-family mode

Usage Guide: Configure the introduction of the peer or peer group.

Example: Set the description string as tester with neighbor 10.1.1.64.

Switch(config-router)#neighbor 10.1.1.64 description tester

Switch(config-router)#

7.52 neighbor distribute-list

Command: neighbor   {*<ip-address>*|*<TAG>*}   distribute-list {*<1-199>*|*<1300-2699>*|*<WORD>*} {in|out}

            no   neighbor   {*<ip-address>*|*<TAG>*}   distribute-list {*<1-199>*|*<1300-2699>*|*<WORD>*} {in|out}

Function: Configure the policy applied in partner route update transmission. The "**no neighbor {*<ip-address>*|*<TAG>*} distribute-list {*<1-199>*|*<1300-2699>*|*<WORD>*} {in|out}**" command cancels the policy configuration.

Parameter: *<ip-address>*: Neighbor IP address.

   ***<TAG>*:** Name of peer group.

   ***<1-199>*|*<1300-2699>*|*<WORD>*:** Number or name of the access-list.

Default: Policy not applied.

Command Mode: BGP route mode and address-family mode

Usage Guide: Configure the policies with access-list command and apply this command on route sending and receiving. It will filter the update route from partner when use in mode, and will filter the route from local side to partner with out mode.

Example: Send into neighbor route 10.1.1.66, to filter the route with the aim 100.1.0.0.

Switch(config)#access-list 101 deny ip 100.1.0.0 0.0.1.255 any

Switch(config)#access-list 101 permit ip any any

Switch(config)#router bgp 100

Switch(config-router)# neighbor 10.1.1.66 distribute-list 101 in

Related Command: ip access-list

7.53 neighbor dont-capability-negotiate

Command: neighbor {*<ip-address>|<TAG>*} dont-capability-negotiate

            no neighbor {*<ip-address>|<TAG>*} dont-capability-negotiate

Function: Set to not perform capability negotiate in creating connections. The "**no neighbor {*<ip-address>|<TAG>*} dont-capability-negotiate**" command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

            ***<TAG>*:** Name of the peer group.

Default: Capability negotiation performed.

Command Mode: BGP route mode and address-family mode

Usage Guide: As the negotiation is the default, it can be disabled with this configuration when it is known that the partner BGP version is old which don't support capability negotiation.

Example: Last addition capability negotiation will not be realized in the connection by configuring as follows.

Switch(config-router)#neighbor 10.1.1.64 dont-capability-negotiate

7.54 neighbor ebgp-multihop

Command: neighbor {*<ip-address>|<TAG>*} ebgp-multihop [*<1-255>*]

            no neighbor {*<ip-address>|<TAG>*} ebgp-multihop [*<1-255>*]

Function: Configures the EBGP neighbors can existing in different segment as well as its hop count (TTL). The "**no neighbor {*<ip-address>|<TAG>*} ebgp-multihop [*<1-255>*]**" set that the EBGP neighbors must be in the same segment.

Parameter: *<ip-address>*: Neighbor IP address.

            ***<TAG>*:** Name of the peer group.

            ***<1-255>*:** Allowed hop count.

Default: Must be in the same segment.

Command Mode: BGP route mode and address-family mode

Usage Guide: Without this command, EBGP peers are required to be in the same segment and after this command is configured, peer addresses may from different segments. The allowed hop count can be configured and will be 255 if not.

Example:

Three device 10.1.1.64(AS100) and 11.1.1.120(AS300) connected respectively to the two interface 10.1.1.66 and 10.1.1.100 of another device. IGP accessibilities of 10.1.1.64 and 11.1.1.120 on both side routes are ensured through static configuration. The neighbor relationship is established only after both side are configured as follows:

on 10.1.1.64

Switch(config-router)#neighbor 11.1.1.120 ebgp-multihop

on 11.1.1.120

Switch(config-router)#neighbor 10.1.1.64 ebgp-multihop

After this, switches in different segments will be able to create BGP neighbor relationship.

7.55 neighbor enforce-multihop

Command: neighbor {*<ip-address>|<TAG>*} enforce-multihop

          no neighbor {*<ip-address>|<TAG>*} enforce-multihop

Function: Enforce the multihop connection to the neighbor. The "**no neighbor {*<ip-address>|<TAG>*} enforce-multihop**" command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

          ***<TAG>*:** Name of peer group.

Default: Not enforced.

Command Mode: BGP route mode and address-family mode

Usage Guide: In fact the direct route can not be enforced to multihop, however will be treated as a multihop connection with this configuration, namely the check originally only performed on IBGP and EBGP of non-direct routes will be performed on all after this attribute set. The nexthop direct connected check will not be performed at exit in enforce multihop conditions.

Example: Enforce neighbor 10.1.1.66 as multihop connection.

Switch(config-router)#neighbor 10.1.1.66 enforce-multihop

7.56 neighbor filter-list

Command: neighbor {*<ip-address>|<TAG>*} filter-list *<.LINE>* {*<in>|<out>*}

          no neighbor {*<ip-address>|<TAG>*} filter-list *<.LINE>* {*<in>|<out>*}

Function: Access-list control for AS-PATH. The "**no neighbor {*<ip-address>|<TAG>*} filter-list *<.LINE>* {*<in>|<out>*}**" cancels the AS-PATH access-list control.

Parameter: *<ip-address>*: Neighbor IP address.

          ***<TAG>*:** Name of peer group.

          ***<LINE>*:** AS-PATH access-list name configured through ip as-path access-list

<.LINE> <permit|deny> <LINE>.

Default: Not configured.

Command Mode: BGP route mode and address list mode.

Usage Guide: After first configured the IP AS-PATH access-list, apply this option to specified neighbor will be able to send/receive routes with specified AS numbers in the AS list. Accepting or denying depends on the configuration of the access-list, while sending and receiving are configured by this command.

Example:

Configure the AS-PATH access control list, "ASPF" is the name of the access-list. The route with AS number of 100 will not be able to update to the partner due to the filter table control.

Switch(config)#ip as-path access-list ASPF deny 100

Switch(config)#router bgp 100

Switch(config-router)# redistribute static

Switch(config-router)neighbor 10.1.1.66 filter-list aspf out

Relevant Commands: ip as-path access-list

7.57 neighbor interface

Command: neighbor *<ip-address>* interface *<IFNAM>*

　　　　　　no neighbor *<ip-address>* interface *<IFNAM>*

Function: Specify the interface to the neighbor. The "**no neighbor *<ip-address>* interface *<IFNAM>***"of the command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

　　　　　　<IFNAME>: Interface name, e.g. "Vlan 2".

Default: Not configured.

Command Mode: BGP route mode and address-family mode

Usage Guide: Specifies the exit interface to the neighbor with this command. Interface destination accessibility should be ensured.

Example: Set the interface to neighbor 10.1.1.64 as interface vlan 2。

Switch(config-router)# neighbor 10.1.1.64 interface Vlan2

7.58 neighbor maximum-prefix

Command: neighbor {*<ip-address>*|*<TAG>*} maximum-prefix *<1-4294967295>* [*<1-100> <warning-only>*]

　　　　　　no neighbor {*<ip-address>*|*<TAG>*} maximum-prefix *<1-4294967295>*

[*<1-100> <warning-only>*]

Function: Control the number of route prefix from the neighbor. The "**no neighbor {*<ip-address>|<TAG>*} maximum-prefix *<1-4294967295>* [*<1-100> <warning-only>*]**" command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

　　　　　<TAG>: Name of the peer.

　　　　　<1-4294967295>: Max prefix value allowed.

　　　　　<1-100>: Percentage of the max value at which it warns.

　　　　　<warning-only>: Warning only or not.

Default: Not limited.

Command Mode: BGP route mode and address-family mode

Usage Guide: Due to concerns of too much route updates from neighbors (e.g. attack), the max number of prefix acquired from a neighbor is limited, and will warns when the number hits certain rate. If the warning-only option is set, then there will be warning only, if not, the connection to the neighbor will be cut till clear the records with clear ip bgp command.

Example: Configure the maximum number of route prefix from neighbor 10.1.1.64 is 12, and it warns when the number of route prefix reaches 6, and the connection will be cut when the number hit 13.

Switch(config-router)#neighbor 10.1.1.64 maximum-prefix 12 50

7.59 neighbor next-hop-self

Command: neighbor {*<ip-address>|<TAG>*} next-hop-self

　　　　　no neighbor {*<ip-address>|<TAG>*} next-hop-self

Function: Ask the neighbor to point the route nexthop sent by the local side to local side. The "**no neighbor {*<ip-address>|<TAG>*} next-hop-self**" command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

　　　　　<TAG>: Name of peer group.

Default: Not configured by default.

Command Mode: BGP route mode and address-family mode

Usage Guide: In the EBGP environment, the nexthop will automatically point to the source neighbor. However in IBGP environment, the nexthop remains the same for route in the same segment. If it is not broadcast network, errors will be encountered. This command is for force self as the nexthop of the neighbor under IBGP.

Example:

Switch(config-router)#neighbor 10.1.1.66 next-hop-self

7.60 neighbor override-capability

Command: neighbor {*<ip-address>*|*<TAG>*} override-capability

          no neighbor {*<ip-address>*|*<TAG>*} override-capability

Function: Whether enable overriding capability negotiation. The "**no neighbor {*<ip-address>*|*<TAG>*} override-capability**" command restores the capability negotiation.

Parameter: *<ip-address>*: Neighbor IP address.

          <TAG>: Name of the peer group.

Default: Disabled.

Command Mode: BGP route mode

Usage Guide: With this attribute, error notify due to unsupported capability negotiation the neighbors required will not be sent.

Example:

Switch(config-router)#neighbor 10.1.1.64 override-capability

Related Command: neighbor capability

7.61 neighbor passive

Command: neighbor {*<ip-address>*|*<TAG>*} passive

          no neighbor {*<ip-address>*|*<TAG>*} passive

Function: Configure whether the connecting request is positively sent in the connection with specified neighbor; the "**no neighbor {*<ip-address>*|*<TAG>*} passive**" command restores to positively send the connecting request.

Parameter: *<ip-address>*: Neighbor IP address.

          <TAG>: Name of peer group.

Default: Positively send the connecting request.

Command Mode: BGP route mode and address-family mode

Usage Guide: With this attribute set, the local side will not positively send the TCP connecting request after the neighbors are configured, but stays in listening mode waiting for the connecting request from partners.

Example:

Switch(config-router)#neighbor 10.1.1.64 passive

After configured with this attribute and reestablishing the connection , the local side do not attempt to create connection but stays in ACTIVE state waiting for the TCP connection request from the partner.

7.62 neighbor peer-group (Creating)

Command: neighbor < *TAG*> peer-group

   no neighbor < *TAG*> peer-group

Function: Create/delete a peer group. The "**no neighbor < *TAG*> peer-group**" command deletes a peer group.

Parameter: <*TAG*>: Name of the peer group of which the largest length contains 256 characters.

Default: No peer group.

Command Mode: BGP route mode and address-family mode

Usage Guide: By configuring the peer group, a group of peers with the same attributes will be configured at the same time so to reduce the configuration staff labor. Assign members to the peer group with neighbor <ip-address> peer-group <TAG> command.

Example:

Switch(config-router)#neighbor pg peer-group

Switch(config-router)#neighbor 10.1.1.64 peer-group pg

Switch(config-router)#neighbor pg remote-as 100

Related Command: neighbor peer-group (Configuring group members)

7.63 neighbor peer-group (Configuring group members)

Command: neighbor <*ip-address*> peer-group <*TAG*>

   no neighbor <*ip-address*> peer-group <*TAG*>

Function: Assign/delete peers in the group. The "**no neighbor <*ip-address*> peer-group <*TAG*>**" command deletes the peers from the peer group.

Parameter: <*ip-address*>: Neighbor IP address.

   <*TAG*>: Name of peer group.

Default: No peer group.

Command Mode: BGP route mode and address-family mode

Usage Guide: By configuring the peer group, a group of peers with the same attributes will be configured at the same time so to reduce the configuration staff labor. Create peer group with above command and assign members into the group with this command.

Example: Refer to above examples.

Related Command: neighbor peer-group (Creating)

7.64 neighbor port

Command: neighbor <*ip-address*> port <*0-65535*>

          no neighbor <*ip-address*> port [<*0-65535*>]

Function: Specify the TCP port number of the partner through which the communication carries. The "**no neighbor <*ip-address*> port [<*0-65535*>]**" command restores the port number to default value.

Parameter: <*ip-address*>: Neighbor IP address.

          <*TAG*>: Name of the peer group.

          <*0-65535*>: TCP port number.

Default: Default port number is 179.

Command Mode: BGP route mode and address-family mode

Usage Guide: This is a configuration when the partner may connect through ports not specified by BGP.

Example:

Switch(config-router)#neighbor 10.1.1.64 port 1023

7.65 neighbor prefix-list

Command: neighbor {<*ip-address*>|<*TAG*>} prefix-list <*LISTNAME|number*> {<*in|out*>}

          no neighbor {<*ip-address*>|<*TAG*>} prefix-list <*LISTNAME|number*> {<*in*>|<*out*>}

Function: Configure the prefix restrictions applied in sending or receiving routes from specified   neighbors.The   "**no   neighbor   {<*ip-address*>|<*TAG*>}   prefix-list <*LISTNAME|number*> {<*in*>|<*out*>}**" command cancels this configuration.

Parameter: <*ip-address*>: Neighbor IP address.

          <*TAG*>: Name of the peer group.

          <*LISTNAME|number*>: Name or sequence number of the prefix-list.

          <*in|out*>: Direction on which the restrictions applied.

Default: No prefix restrictions applied.

Command Mode: BGP route mode and address-family mode

Usage Guide: Specify the prefix and its scope by configuring ip prefix-list and determines whether this scope is permitted or denied. Only the route with permitted prefix will be sent or received.

Example:

Switch(config)#ip prefix-list prw permit 100.1.0.0/22 ge 23 le 25

Switch(config)#router bgp 200

Switch(config-router)#redistribute static

Switch(config-router)neighbor 10.1.1.66 prefix-list prw out

7.66 neighbor remote-as

Command: neighbor {<ip-address>|<TAG>} remote-as <as-id>

no neighbor {<ip-address>|<TAG>} [remote-as <as-id>]

Function: Configure the BGP neighbor. The no command is used for deleting BGP neighbors.

Parameter: <ip-address>: Neighbor IP address

<TAG>: Name of peer group

<as-id>: Neighbor AS number, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100).

Default: No neighbors

Command Mode: BGP route mode and address-family mode

Usage Guide: The BGP neighbors are completely generated through command configurations. A neighbor relationship can only be really established by mutual configuring. Partner AS number should be specified in configuration. The neighbor relationship can not be established when the AS number is incorrect. The partner AS number is the same with that of local side inside the AS.

Example: Configure 2 neighbor AS as 100 and 100.200.

Switch(config)#router bgp 200

Switch(config-router)# neighbor 10.1.1.64 remote-as 100

Switch(config-router)# neighbor 10.2.1.64 remote-as 100.200

7.67 neighbor remove-private-AS

Command: neighbor {<ip-address>|<TAG>} remove-private-AS

no neighbor {<ip-address>|<TAG>} remove-private-AS

Function: Configures whether remove the private AS number when sending to the neighbor.The "**no neighbor {<ip-address>|<TAG>} remove-private-AS**" command cancels this configuration.

Parameter: <ip-address>: Neighbor IP address

<TAG>: Name of peer group

Default: Not configured

Command Mode: BGP route mode and address-family mode

Usage Guide: Configure this attribute to avoid assigning the internal AS number to the external AS sometimes. The internal AS number ranges between 64512-65535, which the AS number could not be sent to the INTERNET since it is not a valid external AS number. What removed here is private AS numbers of the totally private AS routes. Those who have private AS numbers while also have public AS numbers are not processed.

Example:

Switch(config-router)#neighbor 10.1.1.64 remove-private-AS

7.68 neighbor route-map

Command: neighbor {*<ip-address>*|*<TAG>*} route-map *<NAME>* {*<in|out>*}

        no neighbor {*<ip-address>*|*<TAG>*} route-map *<NAME>* {*<in|out>*}

Function: Configure the route mapping policy when sending or receiving route. The "**no neighbor {*<ip-address>*|*<TAG>*} route-map *<NAME>* {*<in|out>*}**" command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address

        ***<TAG>*:** Name of peer group

        ***<NAME>*:** Name of route mapping

        ***<in|out>*:**   Direction of route mapping

Default: Not set

Command Mode: BGP route mode and address-family mode

Usage Guide: First it has to configure route mapping under global mode by creating a route map with route-map command and configure the match condition and actions, then the command can be applied.

Example:

Switch(config)#route-map test permit 5

Switch(config-route-map)#match interface Vlan1

Switch(config-route-map)#set as-path prepend 65532

Switch(config-route-map)#exit

Switch(config)#router bgp 200

Switch(config-router)#neighbor 10.1.1.64 route-map test out

7.69 neighbor route-reflector-client

Command: neighbor {*<ip-address>*|*<TAG>*} route-reflector-client

        no neighbor {*<ip-address>*|*<TAG>*} route-reflector-client

Function: Configure the route reflector client. The "**no neighbor {*<ip-address>*|*<TAG>*}**

route-reflector-client" command cancels this configuration

Parameter: **<ip-address>:** Neighbor IP address

<TAG>: Name of peer group

Default: Not configured.

Command Mode: BGP route mode and address-family mode

Usage Guide: The route reflection is used for reducing the peers when the internal IBGP routers inside AS are too much. The client only exchanges messages with route reflector while the reflector deals with message exchange among each client and other IBGP, EBGP routers. This command configures itself as the route reflector, while specific peer group is as its client. Note: this configuration is only available inside AS.

Example:

Switch(config)#router bgp 100

Switch(config-router)#neighbor 10.1.1.66 remote 100

Switch(config-router)#neighbor 10.1.1.66 route-reflector-client

Switch(config-router)#neighbor 10.1.1.68 remote 100

Switch(config-router)#neighbor 10.1.1.68 route-reflector-client

Switch(config-router)#

Related Command: bgp client-to-client reflection, no bgp client-to-client reflection, bgp cluster-id

7.70 neighbor route-server-client

Command: neighbor {<ip-address>|<TAG>} route-server-client

no neighbor {<ip-address>|<TAG>} route-server-client

Function: Configure the route server client. The "**no neighbor {<ip-address>|<TAG>} route-server-client**" command cancels this configuration.

Parameter: **<ip-address>:** Neighbor IP address

<TAG>: Name of peer group

Default: Not configured

Command Mode: BGP route mode and address-family mode

Usage Guide: The route service is for reducing the peers when the router between AS is too much under EBGP environment. The server transparently transforms the routing messages to other clients with its client exchanges messages through route server.

Example:

Three routers : 10.1.1.64 (AS100） and 10.1.1.68 (AS300） respectively creates neighbor

relationship with the connected 10.1.1.66（AS200）, the configuration is as follows:

Switch(config)#router bgp 200

Switch(config-router)#neighbor 10.1.1.64 remote-as 100

Switch(config-router)#neighbor 10.1.1.64 route-server-client

Switch(config-router)# neighbor 10.1.1.68 remote-as 300

Switch(config-router)# neighbor 10.1.1.68 route-server-client

7.71 neighbor send-community

Command: **neighbor**   **{<ip-address>|<TAG>}**   **send-community [both|extended|standard]**

                no   neighbor   {<ip-address>|<TAG>}   send-community [both|extended|standard]

Function: Configures whether sending the community attribute to the neighbors. The "**no neighbor {<ip-address>|<TAG>} send-community [both|extended|standard]**" command set to not sending.

Parameter: <ip-address>: IP address of the neighbor

           <TAG>: Name of peer group

           [both|extended|standard]: Standard community only, extended community or both.

Default: Sending the community attributes.

Command Mode: BGP route mode and address-family mode

Usage Guide: The community attributes can be sent to the outside or not. By default of our company we set to sending while the default in standard protocol is not sending. By configuring this attribute community attributes will be carried when sending routing information's to the neighbors, or else not. Omission of the following choice will be equal to standard.

Example:

Switch(config-router)#no neighbor 10.1.1.66 send-community

Switch(config-router)#neighbor 10.1.1.66 send-community

7.72 neighbor shutdown

Command: neighbor {<ip-address>|<TAG>} shutdown

           no neighbor {<ip-address>|<TAG>} shutdown

Function: Disconnect the neighbor connection. The "**no neighbor {<ip-address>|<TAG>} shutdown**" cancels this configuration

Parameter: <ip-address>: Neighbor IP address

<TAG>: Name of peer group

Default: Not disconnecting.

Command Mode: BGP route mode and address-family mode

Usage Guide: Directly disconnect/connect to a peer (group) without canceling the neighbor configuration.

Example:

Switch(config-router)#neighbor 10.1.1.64 shutdown

7.73 neighbor soft-reconfiguration inbound

Command: neighbor {<ip-address>|<TAG>} soft-reconfiguration inbound

            no neighbor {<ip-address>|<TAG>} soft-reconfiguration inbound

Function: Configures whether perform inbound soft reconfiguration; the "**no neighbor {<ip-address>|<TAG>} soft-reconfiguration inbound**" command set to not perform the inbound soft reconfiguration.

Parameter: <ip-address>: Neighbor IP address

            <TAG>: Name of peer group

Default: Not perform inbound soft reconfiguration.

Command Mode: The system saves the inbound messages in the buffer after the soft reconfiguration is set, will applies as soon as it restarts so to reduce consumptions of switching with other routers. The command is only available when the route refresh capability is not enabled

Example:

Switch(config-router)#neighbor 11.1.1.120 soft-reconfiguration inbound

7.74 neighbor soo

Command: neighbor <ip-addr> soo <soo-val>

            no neighbor <ip-addr> soo <soo-val>

Function: Configure the origin source from the neighbor route, the no command will delete the configuration.

Parameters: <ip-addr> The neighbor IP address show in dotted decimal notation.

            <soo-val> is the origin source ,which the format is <AA:NN>, 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.

Default: None.

Command Mode: VRF address family mode

Usage Guide: If the user AS connects with several ISP devices, to avoid the user route returns to itself through P area, this attribute can be set. Once this attribute is set, it spreads with route. Routes carrying SOO attributes will not be spreader to a neighbor configured with the attribute.

Example:

Switch (config)#router bgp 100

Switch(config-router)#address-family ipv4 vrf test

Switch(config-router-af)# neighbor 11.1.1.64 remote 200

Switch(config-router-af)# neighbor 11.1.1.64 soo 100.100:10

After this attribute set, the switch will no longer spreads the route with 100.100:10 rt attribute to 11.1.1.64. (what have to be mentioned here is that the soo attribute will be judged together with other rt attributes, which means if the rt is configured with the same attribute, it will be regarded as the origin neighbor even if it's not the real origin source. As a matter of fact, the normal configured soo are a single configuration which is different from rt/rd and unique within the accessible scope. In this way can only the origin concept be exactly expressed).

7.75 neighbor strict-capability-match

Command: neighbor {<*ip-address*>|<*TAG*>} strict-capability-match

　　　　　no neighbor {<*ip-address*>|<*TAG*>} strict-capability-match

Function: Configure whether strict capability match is required when establishing connections. The "**no neighbor {<*ip-address*>|<*TAG*>} strict-capability-match**" command set to not requiring strict match.

Parameter: <*ip-address*>: Neighbor IP address

　　　　　<*TAG*>: Name of peer group

Default: No strict capability match configured.

Command Mode: BGP route mode and address-family mode

Usage Guide: This command takes effect to MP-BGP only. With this command, neighbor can be established when MP-BGP capablilities of the both side are matched, or else it can not be establised. However, whether other capablilities are matched will not affect to establish neighbor.

Example:

Switch(config-router)#neighbor 10.1.1.64 strict-capability-match

7.76 neighbor timers

Command: neighbor {*<ip-address>*|*<TAG>*} timers *<0-65535>* *<0-65535>*

        no neighbor {*<ip-address>*|*<TAG>*} timers *<0-65535>* *<0-65535>*

Function: Configure the KEEPALIVE interval and hold time; the "**no neighbor {*<ip-address>*|*<TAG>*} timers *<0-65535>* *<0-65535>***" command restores the defaults.

Parameter: *<ip-address>*Neighbor IP address

        <TAG>: Name of peer group

        <0-65535>: Respectively the KEEPALIVE and HOLD TIME

Default: Default KEEPALIVE time is 60s, while HOLD TIME is 240s.

Command Mode: BGP route mode and address-family mode

Usage Guide: Send KEEPALIVE interval and HOLD TIME intervals sent in the peer connection. The hold time is the time period for maintain the connection when no message is received from the partner (such as KEEPALIVE). And the connection will be closed after this hold time.

Example:

Switch(config-router)#neighbor 10.1.1.64 timers 50 200

Relevant Commands: neighbor timers connect, timers bgp, no timers bgp

7.77 neighbor timers connect

Command: neighbor {*<ip-address>*|*<TAG>*} timers connect *<0-65535>*

        no neighbor {*<ip-address>*|*<TAG>*} timers connect [*<0-65535>*]

Function: Configure the connecting retry time interval. The "**no neighbor {*<ip-address>*|*<TAG>*} timers connect [*<0-65535>*]**" command restores the default value.

Parameter: *<ip-address>*: Neighbor IP address

        <TAG>: Name of peer group

        <0-65535>: Retry interval

Default: 120s.

Command Mode: BGP route mode and address-family mode

Usage Guide: Configure the connecting time interval when connecting a peer. The NO form restores the default value.

Example:

Switch(config-router)#neighbor 10.1.1.64 timers connect 100

Related Command: neighbor timers

7.78 neighbor unsuppress-map

Command: neighbor {*<ip-address>*|*<TAG>*} unsuppress-map *<WORD>*

          no neighbor {*<ip-address>*|*<TAG>*} unsuppress-map *<WORD>*

Function: Configure or cancel the unsurprising to conditions meet the specified route map. The "**no neighbor {*<ip-address>*|*<TAG>*} unsuppress-map *<WORD>*"** command cancels this configuration.

Parameter: *<ip-address>*: Neighbor IP address.

          ***<TAG>*:** Name of peer group.

          ***<WORD>*:** Name of route-map.

Default: Not set.

Command Mode: BGP route mode

Usage Guide: This command is generally for route suppressed by the aggregated and summary-only conditions. Routes meet the route map conditions will still be send separately other than suppressed.

Example:

Switch(config-router)#neighbor 10.1.1.66 unsuppress-map rmp

Switch(config)#access-list 10 permit 10.1.1.100 0.0.0.255

Switch(config)#route-map rmp permit 5

Switch(config-route-map)#match ip next-hop 10

Route with nexthop as 10.1.1.100 will not be restrained.

7.79 neighbor update-source

Command: neighbor {*<ip-address>*|*<TAG>*} update-source *<IFNAME>*

          no neighbor {*<ip-address>*|*<TAG>*} update-source *<IFNAME>*

Function: Configure the update source. The "**no neighbor {*<ip-address>*|*<TAG>*} update-source *<IFNAME>*"**cancels this configuration

Parameter: *<ip-address>*: Neighbor IP address

          ***<TAG>*:** Name of peer group

          ***<IFNAME>*:** Name or IP of the interface

Default: Not configured, namely use nearest interface.

Command Mode: BGP route mode

Usage Guide: Specified update source is allowed to connect with any available interface which normally is the loop back interface. The NO forms restores to the nearest interface update source. Improper update source use may lead to neighbor connection unavailable, while the invalid interface causes problem which is also the reasons we use loop back

interfaces. Note: the loop back interface should be maintained with its address accessibility to be able to establish connections when as the update source.

Example:

Switch(config-router)#neighbor 10.1.1.66 update-source 192.168.0.1

7.80 neighbor version 4

Command: neighbor {*<ip-address>|<TAG>*} version 4

Function: Configure the BGP version of the partner.

Parameter: *<ip-address>*: Neighbor IP address

        <TAG>: Name of the peer group

        4: Allowed BGP version, 4 only

Default: 4.

Command Mode: BGP route mode

Usage Guide: Only version 4 is supported so far, so whatever the configuration is the version remains at 4.

Example:

Switch(config-router)#neighbor 10.1.1.66 version 4

Switch(config-router)#

7.81 neighbor weight

Command: neighbor {*<ip-address>|<TAG>*} weight *<0-65535>*

          no neighbor {*<ip-address>|<TAG>*} weight [*<0-65535>*]

Function: Configure the route weight sent from the partner. The "**no neighbor {*<ip-address>|<TAG>*} weight [*<0-65535>*]**" command restores the default value.

Parameter: *<ip-address>*: Neighbor IP address.

        <TAG>: Name of IP address.

        <0-65535>: Weight.

Default: The default weight acquired from other routers is 0. The default weight on the local static configuration is 32768.

Command Mode: BGP route mode

Default: The default weight acquired from other routers is 0. The default weight on the local static configuration is 32768.

Usage Guide: The path selecting can be affected through the configuration of the weight. The weight is only relevant to the router which is not an attribute transmittable to outside.

Example:

Switch(config-router)#neighbor 10.1.1.66 weight 500

7.82 network (BGP)

Command: network *<ip-address/M>* [route-map *<WORD>*] [backdoor]

           no network *<ip-address/M>* [route-map *<WORD>*] [backdoor]

Function: Configure the BGP managed network, the route map specified in network application, or set the "back door" for the network. The "**no network *<ip-address/M>* [route-map *<WORD>*] [backdoor]**" command cancels this configuration.

Parameter: *<ip-address/M>*: Network prefix identifier

           ***<WORD>*:** Name of route-map

Default: None

Command Mode: BGP route mode

Usage Guide: As for BGP routes, specify the route through which the BGP advertisements go. With the network defined by this command, the peer will be spreaded into the route map of the neighbor even if there is no route locally. Using the attribute specified in the network application through route map, when specifying the route comes from EBGP or inside the network through back door parameters, the inside route will be the optimized route even if the external route is of shorter distance.

Example:

Switch(config-router)# network 172.16.0.0/16

7.83 redistribute (BGP)

Command: redistribute *<ROUTES>* [route-map *<WORD>*]

           no redistribute *<ROUTES>* [route-map *<WORD>*]

Function: Set the BGP to redistribute route from other modes into BGP. The "**no redistribute *<ROUTES>* [route-map *<WORD>*]**" command cancels this configuration.

Parameter: *<ROUTES>*: Route source or protocol, including: connected, ISIS, kernel, OSPF, RIP, static, etc.

           ***<WORD>*:** Name of route map.

Default: None.

Command Mode: BGP Route Mode.

Usage Guide: Route from other ways will be distributed into the BGP route table with this command and transmitted to the neighbors.

Example: The static route is introduced into BGP with this configuration and advertised to the neighbors.

Switch(config-router)# redistribute static

7.84 redistribute ospf

Command: redistribute ospf [<*process-id*>] [route-map<*word*>]

       no redistribute ospf [<*process-id*>]

Function: To redistribute routing information form OSPF to BGP. The no form of this command will remove the configuration.

Parameters: process-id is the process ID of the OSPF, limited between 1 and 65535. If no process id is specified, the default process id will be used.

       route-map<*word*> is the pointer to the introduced routing map.

Default: Not redistributed by default.

Command Mode: BGP Configuration Mode.

Usage Guide: None.

Example: To redistribute routing of OSPF v2 to BGP (as number is 1).

Switch(config)#router bgp 1

Switch (config-router)#redistribute ospf 2

7.85 redistribute ospf (vrf)

This command is not supported by the switch.

7.86 redistribute ospf (MBGP4+)

Command: redistribute ospf [<*process-tag*>] [route-map<*word*>]

       no redistribute ospf [<*process-tag*>]

Function: To redistribute routing information form OSPFv3 to MBGP4+. The no form of this command will remove the configuration.

Parameters: process-id is the process character string of the OSPFv3, the length is less than 15. If no process id is specified, the default process will be used.

       route-map<*word*> is the pointer to the introduced routing map.

Default: Not redistributed by default.

Command Mode: BGP IPv6 Configuration Mode.

Usage Guide: None.

Example: To redistribute routing information from OSPFv3 process with the tag as ABC to MBGP4+ (as number as 1).

Switch (config)#router bgp 1

Switch (config-router)#address-family ipv6 unicast

Switch (config-router-af)#redistribute ospf abc

7.87 router bgp

Command: router bgp <as-id>

          no router bgp <as-id>

Function: Enable BGP instance. The "**no router bgp <as-id>**" command deletes BGP instance.

Parameter: <as-id>: AS number, ranging from 1 to 4294967295, it can be shown in decimal notation (such as 6553700) or delimiter method (such as 100.100).

Default: BGP not enabled.

Command Mode: Global mode

Usage Guide: Enable BGP by specified AS, and then enter the config-router state, the protocol can be configured at this prompt.

Example: Enable BGP, AS number is 4294967295 in decimal notation.

Switch(config)#router bgp 4294967295

Switch(config-router)#exit

Enable BGP, AS number is 4294967295 in delimiter method.

Switch(config)#router bgp 65535.65535

Switch(config-router)#exit

7.88 set vpnv4 next-hop

Command: set vpnv4 next-hop <ip-addr>

          no set vpnv4 next-hop <ip-addr>

Function: Configure the nexthop of the VPNv4 route.

Parameter: <ip-addr> is nexthop of VPNv4 route.

Default: None.

Command Mode: VRF mode

Usage Guide: Configure VPNv4 route nexthop with this command. As normal nexthop settings are only for IPv4 route, this command specially configures the VPNv4 address-family.

Example:

Configure the address-family as follows:

Switch(config)#route-map map1 permit 15

Switch(config-map)#match interface Vlan1

Switch(config-map)#set weight 655

Switch(config-map)#set vpnv4 next-hop 10.1.1.250

Switch(config-map)#exit

Switch(config)#router bgp 100

Switch(config-router)#neighbor 10.1.1.68 remote-as 100

Switch(config-router)#neighbor 10.1.1.68 route-map map1 in

Switch(config-router)#address-family vpnv4 unicast

Switch(config-router-af)#neighbor 10.1.1.68 activate

Switch(config-router-af)#exit-address-family

View the route message after refresh:

Switch#show ip bgp vpnv4 all

Network	Next Hop	Metric	LocPrf	Weight Path
Route Distinguisher: 100:10 (Default for VRF test)				
*> 11.1.1.0/24	11.1.1.64	0		0 200 ?
*>i15.1.1.0/24	10.1.1.250	0	100	655 200 ?
*> 20.1.1.0/24	11.1.1.64	0		0 200 ?
*>i100.1.1.0/24	10.1.1.250	0	100	655 200 ?
Route Distinguisher: 100:10				
*>i15.1.1.0/24	10.1.1.68	0	100	0 200 ?
*>i100.1.1.0/24	10.1.1.68	0	100	0 200 ?

We can see that the nexthop 10.1.1.68 of the VPN route is changed to 10.1.1.250 after applied with route-map.

7.89 show ip bgp

Command: show ip bgp [<ADDRESS-FAMILY>] [<ip-address>|<ip-address/M> [longer-prefixes]| cidr-only]

Function: For displaying the routing messages permitted by BGP.

Parameter: <ADDRESS-FAMILY>: address-family such as "ipv4 unicast"

            <ip-address>: IP address

            <ip-address/M>: IP address and the mask

Default: None.

Command Mode: Admin and configuration mode

Usage Guide: We can display BGP routing messages by different parameters (such as address-family or IPv4 address), or a route covered by a prefix, or only the routing message don't match the earliest IP address-family (namely the route is not A or B or C type address.)

Example:

Switch#show ip bgp

BGP table version is 147, local router ID is 10.1.1.64

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

           S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 12.0.0.0	10.1.1.121	0		32768	?
*> 100.1.1.0/24	10.1.1.200	0		32768	?
*> 100.1.2.0/24	10.1.1.200	0		32768	?
*> 172.0.0.0/8	0.0.0.0			32768	i

Total number of prefixes 4

7.90 show ip bgp attribute-info

Command: show ip bgp attribute-info

Function: Display the BGP attributes messages.

Parameter: None.

Default: None.

Command Mode: Admin and configuration mode.

Usage Guide: For displaying the attribute messages permitted by BGP.

Example:

Switch#sh ip bgp attribute-info

attr[1] nexthop 0.0.0.0

attr[1] nexthop 10.1.1.64

attr[3] nexthop 10.1.1.64

attr[1] nexthop 10.1.1.121

attr[2] nexthop 10.1.1.200

7.91 show ip bgp community

Command: show ip bgp [<*ADDRESS-FAMILY*>] community <*TYPE*> [exact-match]

Function: For displaying route permitted by BGP with community information.

Parameter: <*ADDRESS-FAMILY*>: Address-family, such as "ipv4 unicast"

        <*TYPE*>: Community attributes number show in AA:NN form or combination of local-AS, no-advertise, and no-export.

Default: None

Command Mode: Admin and configuration mode

Usage Guide: We can choose several communities at a time, exact-match shows only the perfect match entries will be displayed.

Example:

Switch#show ip bgp community

BGP table version is 10, local router ID is 10.1.1.64

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

           S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

   Network   Next Hop   Metric LocPrf Weight Path

*   100.1.1.0/24   0.0.0.0   32768 700 800 i

*> 172.0.0.0/8   0.0.0.0   32768 700 800 i

Total number of prefixes 2

7.92 show ip bgp community-info

Command: show ip bgp community-info

Function: For displaying the community messages permitted by BGP.

Parameter: None

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Messages in the same community multiply closable at the same time.

Example:

Switch#show ip bgp community-info

Address Refcnt Community

[0x3312558] (3) 100:50

7.93 show ip bgp community-list

Command: show ip bgp [<*ADDRESS-FAMILY*>] community-list <*NAME*> [exact-match]

Function: For displaying the routes containing the community list messages and permitted by BGP

Parameter: <*ADDRESS-FAMILY*>:   Address-family such as "ipv4 unicast"

        <*NAME*>: Community list

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Configure the community list with ip community-list command and the contained community as well. When displayed with its name, communities included in all the lists are contained.

Example:

Switch(config)#ip community-list commu per 100:50

Switch#sh ip bgp community-list commu

BGP table version is 25, local router ID is 10.1.1.64

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

          S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Next Hop	Metric LocPrf Weight Path
*	100.1.1.0/24	0.0.0.0	32768 700 800 i
*>	172.0.0.0/8	0.0.0.0	32768 700 800 i

Related Command: ip community-list

7.94 show ip bgp dampening

Command: show   ip   bgp   [<ADDRESS-FAMILY>]   dampening {<dampened-paths>|<flap-statistics>|<parameters>}

Function: Display the routes permitted by BGP and relevant to the route dampening.

Parameter: *<ADDRESS-FAMILY>*: Address-family, such as "ipv4 unicast".

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Only the surged routes will be displayed. The Parameters shows the display configuration other than specific routes. The other two options will respectively show the restrained route and the dampening (recently recovered from invalid) routing messages.

Example:

Switch#sh ip bgp dampening dampened-paths

BGP table version is 12, local router ID is 10.1.1.66

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

          S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	From	Reuse	Path

*d 100.1.3.0/24   10.1.1.64   00:27:40 100 ?

Total number of prefixes 1

Switch#sh ip bgp dampening flap-statistics

BGP table version is 13, local router ID is 10.1.1.66

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

              S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	From	Flaps	Duration	Reuse	Path
*d 100.1.3.0/24	10.1.1.64	3	00:06:05	00:27:00	100 ?

Switch#sh ip bgp dampening parameters

 dampening 15 750 2000 60 15 (route-map rmp)

  Reach ability Half-Life time   : 15 min

  Reuse penalty   : 750

  Suppress penalty   : 2000

  Max suppress time   : 60 min

  Un-reach ability Half-Life time : 15 min

  Max penalty (ceil)   : 11999

  Min penalty (floor)   : 375

Total number of prefixes 1

Related Command: bgp dampening

7.95 show ip bgp filter-list

Command: show ip bgp [<*ADDRESS-FAMILY*>] filter-list [<*WORD* >]

Function: For displaying the routes in BGP meeting the specific AS filter list.

Parameter: <*ADDRESS-FAMILY*>: address-family such as "ipv4 unicast"

          < *WORD* >: AS-PATH access-list name

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Configure AS access-list with ip as-path access-list command. This command can show the routes passed the access-list.

Example:

Switch#SH IP BGP filter-list FL

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric LocPrf Weight Path
*> 100.1.1.0/24	10.1.1.64	0　　　　0 100 ?

Total number of prefixes 1

Related Command: neighbor filter-list, ip as-path access-list

7.96 show ip bgp inconsistent-as

Command: show ip bgp [<ADDRESS-FAMILY>] inconsistent-as

Function: For displaying routes with inconsistent BGP AS.

Parameter: <ADDRESS-FAMILY>: address family such as "ipv4 unicast".

Default: None

Command Mode: Admin and configuration mode

Usage Guide: If same prefix comes from different origin AS, the AS will be regarded as inconsistent. This command is for displaying this kind of routes.

Example:

Switch#sh ip bgp inconsistent-as

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric LocPrf Weight Path
*　100.1.1.0/24	10.1.1.68	0　　　　0 300 ?
*>	10.1.1.64	0　　　　0 100 ?

Total number of prefixes 1

7.97 show ip bgp neighbors

**Command: show   ip   bgp   [<ADDRESS-FAMILY>]   neighbors   [IP-ADDRESS]
[advertised-routes|received {prefix-filter|routes}|routes]**

Function: For displaying the BGP neighbor related messages.

Parameter: <ADDRESS-FAMILY>: Address-family, such as "ipv4 unicast"

　　　　<ip-address>: Neighbor IP address

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Display detailed messages of all neighbors by this command without parameters. Specifying IP address will show the detailed information of the neighbors with specified IP address. The advertised-routes、received prefix-filter、received routes、routes

parameters will respectively displays the routes broadcast on local side, the received prefix filter, received routes (soft reconfiguration enabled) and the routing message from specific neighbor.

Example:

Switch#sh ip bgp neighbor

BGP neighbor is 10.1.1.66, remote AS 200, local AS 100, external link

  BGP version 4, remote router ID 11.1.1.100

  BGP state = Established, up for 00:13:43

  Last read 00:13:43, hold time is 240, keep alive interval is 60 seconds

  Neighbor capabilities:

    Route refresh: advertised and received (old and new)

    Address family IPv4 Unicast: advertised and received

  Received 17 messages, 0 notifications, 0 in queue

  Sent 17 messages, 0 notifications, 0 in queue

  Route refresh request: received 0, sent 0

  Minimum time between advertisement runs is 30 seconds

 For address family: IPv4 Unicast

  BGP table version 2, neighbor version 2

  Index 1, Offset 0, Mask 0x2

  Community attribute sent to this neighbor (both)

  0 accepted prefixes

  1 announced prefixes

 Connections established 7; dropped 6

7.98 show ip bgp paths

Command: show ip bgp [<*ADDRESS-FAMILY*>] paths

Function: Display the path message permitted by BGP.

Parameter: <*ADDRESS-FAMILY*>: Address-family such as "ipv4 unicast".

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Display the BGP path message includes the utilization state.

Example:

Switch#sh ip bgp paths

Address   Refcnt Path

[0x331dad0:0] (1)

[0x331d850:93] (1) 600

[0x331d8d8:249] (2) 200 300

7.99 show ip bgp prefix-list

Command: show ip bgp [*<ADDRESS-FAMILY>*] prefix-list [*<NAME>*]

Function: For displaying the route meet the specific prefix-list in BGP.

Parameter: *<ADDRESS-FAMILY>*: Address family such as "ipv4 unicast"

       <NAME>: Name of prefix-list

Default: None

Command Mode: Admin and configuration mode

Usage Guide: We can select the required BGP route by regular expression.

Example:

Switch(config)#ip prefix-list PL permit any

Switch(config)#

Switch#sh ip bgp prefix-list PL

BGP table version is 1, local router ID is 10.1.1.64

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

          S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Next Hop	Metric	LocPrf Weight Path
*	100.1.1.0/24	10.1.1.66		0 200 300 ?
*>		10.1.1.100	0	32768 ?

Total number of prefixes 1

7.100 show ip bgp quote-regexp

Command: show ip bgp [*<ADDRESS-FAMILY>*] quote-regexp [<WORD>]

Function: For displaying the BGP route meets the specific AS related regular expression.

Parameter: <ADDRESS-FAMILY>: >: address-family such as "ipv4 unicast"

       <WORD>: Regular expression

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Selecting the required route through regular expressions.

Example:

Switch#sh ip bgp quote-regexp ^300$

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric LocPrf Weight Path
*> 100.1.1.0/24	10.1.1.68	0　　　　　0 300 ?

Total number of prefixes 1

Switch#sh ip bgp quote-regexp 100

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric LocPrf Weight Path
*　　100.1.1.0/24	10.1.1.64	0　　　　　0 500 100 600 ?

Total number of prefixes 1

7.101 show ip bgp redistribute

This command is not supported by the switch.

7.102 show ip bgp neighbors

This command is not supported by the switch.

7.103 show ip bgp regexp

Command: show ip bgp [<*ADDRESS-FAMILY*>] regexp [<*LINE*>]

Function: For displaying the BGP routes meets specific AS related normal expressions.

Parameter: <*ADDRESS-FAMILY*>: **>**: address-family such as "ipv4 unicast"

　　　　<*LINE*>: Regular expression

Default: None

Command Mode: Admin and configuration mode

Usage Guide: We can select BGP route of the required AS with normal expression.

Example:

Switch#sh ip bgp regexp 100

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Next Hop	Metric LocPrf Weight Path
*	100.1.1.0/24	10.1.1.64	0　　　　　0 500 100 600 ?

Total number of prefixes 1

7.104 show ip bgp route-map

Command: show ip bgp [<ADDRESS-FAMILY>] route-map [<NAME>]

Function: For displaying the BGP routes meets the specific related route map.

Parameter: <ADDRESS-FAMILY>: such as "ipv4 unicast"

　　　　　<NAME>: Name of route map

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Configure the route map with the route-map command, through which it can be displayed that process routes with route map. The command will display the routes meet specific route map.

Example:

Switch#sh ip bgp route-map rmp

BGP table version is 2, local router ID is 11.1.1.100

Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,

　　　　　S Stale

Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Next Hop	Metric LocPrf Weight Path
*	100.1.1.0/24	10.1.1.64	0　　　　　0 500 100 600 ?
*>		10.1.1.68	0　　　　　0 300 ?

Total number of prefixes 1

7.105 show ip bgp scan

Command: show ip bgp scan

Function: For displaying BGP scan messages.

Parameter: None

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Scan regularly the nexthop messages. The command can show the current interval and related routes.

Example:

Switch#show ip bgp scan

BGP Instance: (Default) AS 200, router-id 11.1.1.100

BGP scan interval is 60

Current BGP nexthop cache:

Related Command: bgp scan-time

7.106 show ip bgp summary

Command: show ip bgp [<*ADDRESS-FAMILY*>] summary

Function: For displaying the BGP summary information.

Parameter: <*ADDRESS-FAMILY*>: Address-family such as "ipv4 unicast".

Default: None.

Command Mode: Admin and configuration mode

Usage Guide: Display some basic summary information of BGP.

Example:

Switch#show ip bgp summary

BGP router identifier 10.1.1.66, local AS number 200

BGP table version is 1

1 BGP AS-PATH entries

0 BGP community entries

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
10.1.1.68	4	300	0	0	0	0	0	never	Active

Total number of neighbors 1

Display Contents	Explanation
identifier	Local identifier
local AS number	The number of AS of local router
table version	the version number of BGP interior database

AS-PATH entries	The tabulation of the AS-PATH entries
community entries	The property of the community entries
Neighbor	Neighbor address
V	The BGP version of neighbor running
AS	The AS number of neighbor what is affiliated with
MsgRcvd	The amount of message received from neighbor
MsgSent	The amount of message sent to the neighbor
TblVer	the version of route table
Up/Down	It will display the conversation time length if the state with neighbor was established, otherwise display the present status.
State/PfxRcd	If the state is established, display the amount of the prefix received of the router.otherwise,display the state of the neighbor at present.

7.107 show ip bgp view

Command: show ip bgp view [*<NAME>*] [*<ip-address>* | *<ip-address/M>* | [*<ADDRESS-FAMILY>*] summary]

Function: For displaying the messages of specified BGP instance.

Parameter: *<NAME>*: Name of BGP instance

        <ip-address>: IP address

        <ip-address/M>: IP address and mask

        <ADDRESS-FAMILY>: Address-family such as "ipv4 unicast"

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Display messages of specified BGP instance.

Example:

Switch#show ip bgp view as300 100.1.1.0/24

Related Command: router bgp

7.108 show ip bgp view neighbors

Command: show ip bgp view [*<NAME>*] neighbors [*<ip-address>*]

Function: Display neighbor messages of specified BGP instance.

Parameter: *<NAME>*: Name of BGP instance

        <ip-address>: neighbor IP address

Default: None

Command Mode: Admin and configuration mode

Usage Guide: Display neighbor messages of specified BGP instance.

Example:

Switch#show ip bgp view as300 neighbors

7.109 show ip bgp vrf

Command: show ip bgp vrf [NAME] {summary | A.B.C.D | A.B.C.D/M}

Function: For displaying the routing messages and the neighbors permitted by BGP.

Parameter: <NAME>: The name of the VRF instance

summary: Display the summary information of the BGP neighbor

A.B.C.D: IP address

A.B.C.D/M: IP address and the mask

Default: None.

Command Mode: Admin and configuration mode

Usage Guide: Display BGP routing messages by different parameters (such as IPv4 address or IPv4 address/mask), or a route covered by a prefix, or only the routing information don't match the earliest IP address (namely the route is not A or B or C type address.)

Example:

1) Display the bgp neighbor information:

S2#show ip bgp vrf 1 summary

BGP router identifier 30.1.1.2, local AS number 200

BGP table version is 8

1 BGP AS-PATH entries

0 BGP community entries

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
30.1.1.1	4	100	57	51	8	0	0	00:41:44	31

Total number of neighbors 1

The explanation of the displayed contents:

Displayed Content	Explanation
identifier	The local identifier
local	AS
table	version
AS-PATH	entries
community	entries

Neighbor	Neighbor address
V	Neighbor runs BGP
AS	Neighbor belongs to AS
MsgRcvd	The information number received from the neighbor
MsgSent	The information number is sent to the neighbor
TblVer	Route table version
Up/Down	If the state is established with the neighbor, display the dialog time, or display the current state
State/PfxRcd	If the state is established with the neighbor, display the prefix number of the received route, or display the current state

2) Display the BGP route information:

S2#show ip bgp vrf 1
BGP routing table entry for 44.1.1.0/24
Paths: (1 available, best #1, table vrf 1 ipv4 unicast)
  Not advertised to any peer
  100
    30.1.1.1 from 30.1.1.1 (30.1.1.1)
      Origin incomplete, metric 6, localpref 100, valid, external, best
      Last update: 00:41:47
BGP routing table entry for 44.1.2.0/24
Paths: (1 available, best #1, table vrf 1 ipv4 unicast)
  Not advertised to any peer
  100
    30.1.1.1 from 30.1.1.1 (30.1.1.1)
      Origin incomplete, metric 6, localpref 100, valid, external, best
      Last update: 00:41:47
BGP routing table entry for 44.1.3.0/24
Paths: (1 available, best #1, table vrf 1 ipv4 unicast)
  Not advertised to any peer
  100
    30.1.1.1 from 30.1.1.1 (30.1.1.1)
      Origin incomplete, metric 6, localpref 100, valid, external, best
      Last update: 00:41:47
BGP routing table entry for 44.1.4.0/24
Paths: (1 available, best #1, table vrf 1 ipv4 unicast)
  Not advertised to any peer
  100
    30.1.1.1 from 30.1.1.1 (30.1.1.1)
      Origin incomplete, metric 6, localpref 100, valid, external, best
      Last update: 00:41:47

7.110 show ip bgp vpnv4

Command: show ip bgp vpnv4 {all | rd <rd-val> | vrf <vrf-name>}

Function: Display all VRF route messages or the specific VRF route message.

Parameter: all: All VPNv4 peers;

rd-val: is the route identification label which is normally the   (AS number or IP address) : digits, such as 100:10;

rf-name: is the name of VRF, created through if vrf *<vrf-name>* command.

Default: None.

Command Mode: All modes

Usage Guide: Available to display by specified RD or VRF.

Example:

Switch#show ip bgp vpn4 all

Network Next Hop Metric LocPrf Weight Path

Route Distinguisher: 100:10 (Default for VRF test)

*> 11.1.1.0/24 11.1.1.64 0 0 200 ?

*> 20.1.1.0/24 11.1.1.64 0 0 200 ?

7.111 show ipv6 bgp redistribute

Command: show ipv6 bgp redistribute

Function: Show the configuration information of redistribution other out routing to MBGP4+.

Parameter: None.

Default: Not shown by default.

Command Mode: Admin Mode and Configuration Mode.

Usage Guide: None.

Example:

Switch#show ipv6 bgp redistribute

7.112 timers bgp

Command: timers bgp *<0-65535> <0-65535>*

no timers bgp [*<0-65535> <0-65535>*]

Function: Configure all neighbor time in BGP. The "**no timers bgp [*<0-65535> <0-65535>*]**" command restores these times to default value.

Parameter: *<0-65535>* Respectively the KEEPALIVE interval and the hold time.

Default: KEEPALIVE is 60s, HOLD TIME is 240s.

Command Mode: Admin and Configuration Mode.

Usage Guide: Similar to neighbor time configuration which just performed on all neighbors

Example:

Switch(config-router)# timers bgp 50 200

Relevant Commands: neighbor timers, no neighbor timers

Chapter 8 Commands for Black Hole Routing

8.1 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

8.2 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 9 Commands for GRE Tunnel Configuration

9.1 debug gre

Command: debug gre {packet | events | all}

        no debug gre {packet | events | all}

Function: Open the corresponding debug switch of the GRE tunnel.

Parameter: all: Open the display function of all debug information for GRE tunnel.

        packet: Open the display function of the receiving/sending packets information for GRE tunnel.

        events: Open the display function of the event information for GRE tunnel.

Command mode: Admin mode

Default: None.

Example: Open the corresponding debug switch of the GRE tunnel, all the information of processing, encapsulating and forwarding of the GRE tunnel will be shown.

Switch# debug gre all

GRE Tunnel PACKET: sent, src <1.1.1.1>, dst <1.1.1.2>, size <140>, proto <0x0800>, to <tunnel1>

GRE Tunnel PACKET: recv, src <1.1.1.2>, dst <1.1.1.1>, size <140>, proto <0x0800>, from <tunnel1>

9.2 ip address

Command: ip address <ipv4-address> <mask>

        no ip address <ipv4-address> <mask>

Function: Configure the IPv4 address of GRE tunnel interface.

Parameter: <ipv4-address> is IPv4 address, **<mask>** is the sub-net mask.

Command mode: Tunnel interface configuration mode.

Default: None.

Usage Guide: When configuring the interface address is IPv4 address for GRE tunnel, only one primary address can be set, but secondary address can not be set. This limitation will also be used to other tunnels, such as configure tunnel, 6to4, isatap.

Notice: the tunnel must stays in active state when configuring IPv4 address, so it is different to IPv6 address.

Example: Configure the interface address is IPv4 address for GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config-if-tunnel1)#ip address 11.0.0.1 255.255.255.0

9.3 ip route

Command: ip route *<ipv4-address/mask>* tunnel *<ID>*

            no ip route *<ipv4-address/mask>* tunnel *<ID>*

Function: Configure the output interface of IPv4 static route as GRE tunnel.

Parameter: *<ipv4-address >* is the IPv4 address, ***<mask>*** is the sub-net mask, ***<ID>*** is GRE tunnel ID.

Command mode: Global mode.

Default: None.

Usage Guide: Configure the output interface of IPv4 static route as GRE tunnel.

Example: Configure the output interface of IPv4 static route as GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config)#ip route 101.0.0.0/24 tunnel 1

9.4 ipv6 address

Command: ipv6 address *<ipv6-address/prefix>*

            no ipv6 address *<ipv6-address/prefix>*

Function: Configure the IPv6 address for the GRE tunnel interface.

Parameter: *<ipv6-address>* is the IPv6 address, ***<prefix>*** is prefix length.

Command mode: Tunnel interface configuration mode.

Default: None.

Usage Guide: When configuring the interface IPv6 address for GRE tunnel, and only one IPv6 address can be configured. This limitation will also be used to other tunnels, such as configure tunnel, 6to4, isatap.

Notice: 6to4 tunnel will generate an IPv6 address automatically. When configuring IPv6 address, the tunnel may stay in active state, so it is different to IPv4 address.

Example: Configure the interface IPv6 address for GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config-if-tunnel1)#ipv6 address 2011::1/64

9.5 ipv6 route

Command: ipv6 route *<ipv6-address/prefix>* tunnel *<ID>*

        no ipv6 route *<ipv6-address/prefix>* tunnel *<ID>*

Function: Configure the output interface of IPv6 static route as GRE tunnel.

Parameter: *<ipv6-address >* is the IPv6 address, ***<prefix>*** is the prefix length, ***<ID>*** is the GRE tunnel ID.

Command mode: Global mode.

Default: None.

Usage Guide: Configure the output interface of IPv6 static route as GRE tunnel.

Example: Configure the output interface of IPv6 static route as GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config)# ipv6 route 2080::/64 tunnel 1

9.6 loopback-group (Global)

Command: loopback-group *<id>*

        no loopback-group *<id>*

Function: Create loopback-group.

Parameter: *<id>* is the loopback-group ID, the ranging from 1 to 128.

Command mode: Global Mode.

Default: None.

Usage Guide: Create loopback-group.

Example: Create loopback-group 1.

Switch(config)#loopback-group 1

9.7 loopback-group (Port)

Command: loopback-group *<id>*

        no loopback-group *<id>*

Function: Join layer 2 Ethernet port in the specified loopback-group.

Parameter: *<id>* is the loopback-group ID, the ranging from 1 to 128.

Command mode: Port Mode.

Default: None.

Usage Guide: There is no configuration for a specified port before join it in a loopback-group.

Example: Join port 1/0/1 in loopback-group 1.

Switch (config-if-ethernet1/0/1)#loopback-group 1

9.8 loopback-group (Tunnel Interface)

Command: loopback-group *<id>*

  no loopback-group *<id>*

Function: The specified tunnel quotes a specified loopback group.

Parameter: *<id>* is the loopback-group ID, the ranging from 1 to 128.

Command mode: Tunnel Interface Mode.

Default: None.

Usage Guide: The specified tunnel quotes a loopback group. At present only GRE tunnel and ISATAP tunnel can be supported by this function, but ISATAP tunnel quotes loopback group is mutually exclusive to nexthop configuration.

Example: The specified tunnel 1 quotes loopback group 1.

Switch (config-if-tunnel1)#loopback-group 1

9.9 show gre tunnel

Command: show gre tunnel {<1-50 |>}

Function: Display the configuration information of GRE tunnel.

Parameter: <1-50>: The tunnel ID.

Command mode: Admin mode and configuration mode.

Default: None.

Example: Display the configuration information of GRE tunnel.

Switch# show gre tunnel

name	mode	source	destination
Tunnel1	gre ip	192.168.1.1	192.168.1.2
Tunnel2	gre ipv6	2001::1	2001::2

Displayed Information	Explanation
name	The tunnel name
mode	The tunnel type
source	The tunnel source address （IPv4 or IPv6）
destination	The tunnel destination address （IPv4 or IPv6）

9.10 show interface tunnel

Command: show interface tunnel *<1-50>*

Function: Display the relative information of the tunnel interface.

Parameter: <1-50>: The tunnel ID.

Default: None.

Command mode: Admin mode and configuration mode.

Example: Display the relative information of the specific tunnel interface. If the specific tunnel is GRE tunnel, then display the relative information of the specific GRE tunnel interface.

Switch# show interface tunnel 1

Tunnel1 is up, line protocol is up, dev index is 8001

   Device flag 0x81(UP NOARP)

   IPv4 address is:

     (NULL)

   VRF Bind: Not Bind

9.11 tunnel destination

Command: tunnel destination <ipv4-address>

          no tunnel destination

Function: Configure the IPv4 address as the destination address for GRE tunnel.

Parameter: *<ipv4-address>* is the IPv4 address.

Command mode: Tunnel interface configuration mode.

Default: None.

Usage Guide: Configure the IPv4 address as the destination address for GRE tunnel.

Example: Configure the IPv4 address as the destination address for GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config-if-tunnel1)#tunnel destination 60.0.0.3

9.12 tunnel mode gre ip

Command: tunnel mode gre ip

         no tunnel mode

Function: Configure the tunnel mode as GREv4, after data packets are encapsulated with GREv4, it has an IPv4 packet head and pass the IPv4 network.

Parameter: None.

Command mode: Tunnel interface configuration mode.

Default: None.

Usage Guide: Configure the GREv4 tunnel mode, the data packets are encapsulated with GREv4 to be forwarded.

Example: Configure the data packets to process the encapsulation of the GREv4 to be forwarded.

Switch(config)# interface tunnel 1

Switch(config-if-tunnel1)# tunnel mode gre ip

9.13 tunnel mode gre ipv6

This command is not supported by switch.

9.14 tunnel source

Command: tunnel source <ipv4-address>

              no tunnel source

Function: Configure the IPv4 address as the source address for GRE tunnel.

Parameter: *<ipv4-address>* is the IPv4 address.

Command mode: Tunnel interface configuration mode.

Default: None.

Usage Guide: Configure the IPv4 address as the source address for GRE tunnel.

Example: Configure the IPv4 address as the source address for GRE tunnel.

Switch(config)# interface tunnel 1

Switch(config-if-tunnel1)#tunnel source 10.1.1.3

Chapter 10 Commands for ECMP

10.1 load-balance

Command: load-balance {dst-src-mac | dst-src-ip | dst-src-mac-ip}

Function: Set load-balance mode for switch, it takes effect for port-group and ECMP at the same time.

Parameter: dst-src-mac performs load-balance according to the source and destination MAC

dst-src-ip performs load-balance according to the destination and source IP

dst-src-mac-ip performs load-balance according to the destination and source MAC, the destination and source IP

Command mode: Global mode.

Default: Perform load-balance according to the source and destination MAC.

Usage Guide: Use port-channel or ECMP to implement load-balance, user can configure the load-balance mode according to the requirements. If the specific load-balance mode of the command line is different with the current load-balance mode, then modify the load-balance as the specific load-balance of command line; otherwise return a message to notice that the current mode is already configured.

Example: Set load-balance mode.

Switch(config)#load-balance src-mac-ip

10.2 maximum-paths

Command: maximum-paths <1-8>

no maximum-paths

Function: This command is used to configure the maximum-paths which support the equivalence multi-paths. The no command restores the default configuration.

Parameter: <1-8>: At present, users can configure the multi-paths number from 1 to 8. When configure 1, it is equal to disable ECMP function.

Command mode: Global Mode.

Default: The default number is 4.

Usage Guide: None.

Example: Configure the maximum-paths of the equivalence multi-paths as 8.

Switch(config)# maximum-paths 8

Chapter 11 Commands for BFD

11.1 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

11.2 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

11.3 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

11.4 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

11.5 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

11.6 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

11.7 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

11.8 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)#

11.9 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

11.10 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

11.11 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

11.12 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

11.13 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

11.14 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

11.15 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

11.16 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

11.17 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

11.18 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

11.19 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

11.20 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)

Chapter 12 Commands for BGP GR

12.1 bgp graceful-restart

Command: bgp graceful-restart

    no bgp graceful-restart

Function: Enable BGP to support GR and set restart-time and stale-path-time as the default value, no command disables GR.

Parameter: None.

Command Mode: BGP router configuration mode

Default: Do not enable BGP to support GR.

Usage Guide: None

Example: Configure GR.

Switch(config-router)# bgp graceful-restart

12.2 bgp graceful-restart restart-time

Command: bgp graceful-restart restart-time <1-3600>

    no bgp graceful-restart restart-time <1-3600>

Function: Configure BGP GR's restart-time (Receiving Speaker enables a timeout timer for a neighbor, it uses the restart-time as the timeout). A restart-time specifies the longest waiting time from Receiving Speaker finds restarting to the received OPEN messages. If Receiving Speaker does not receive OPEN messages after exceed the time, it can delete SATLE route saved by neighbor. No command restores restart-time as the default value of 120 seconds.

Parameter: <1-3600>：time in seconds.

Command Mode: BGP route configuration mode

Default: restart-time uses the default value of 120s.

Usage Guide: None

Example: Configure restart-time as 60s for BGP GR

Switch(config-router)# bgp graceful-restart restart-time 60

12.3 bgp graceful-restart stale-path-time

Command: bgp graceful-restart stale-path-time <1-3600>

no bgp graceful-restart stale-path-time <1-3600>

Function: Configure stale-path-time for BGP GR. Specify the longest waiting time that delete stale route from the received OPEN messages to the received EOR for Receiving Speaker. No command restores stale-path-time as the default value of 360 seconds.

Parameter: <1-3600>：time in seconds

Command Mode: BGP route configuration mode

Default: stale-path-time uses the default value of 360s.

Usage Guide: None.

Example: Configure stale-path-time as 460s for BGP GR.

Switch(config-router)# bgp graceful-restart stale-path-time 460

12.4 bgp selection-deferral-time

Command: bgp selection-deferral-time <1-3600>

no bgp selection-deferral-time <1-3600>

Function: Configure selection-deferral-time for BGP GR. Specify the longest waiting time that start to count selection route from the received OPEN messages to the received EOR for Restarting Speaker. If Restarting Speaker does not receive EOR after exceed the time, it can count selection route. No command restores selection-deferral-time as the default value of 120 seconds.

Parameter: <1-3600>：time in seconds

Command Mode: BGP route configuration mode

Default: selection-deferral-time uses the default value of 120s.

Usage Guide: None.

Example: Configure selection-deferral-time as 240s for BGP GR.

Switch(config-router)# bgp selection-deferral-time 240

12.5 neighbor capability graceful-restart

Command: neighbor (A.B.C.D | X:X::X:X | WORD) capability graceful-restart

no neighbor (A.B.C.D | X:X::X:X | WORD) capability graceful-restart

Function: Configure whether neighbor supports GR capability, no command does not support GR capability.

Parameter: (A.B.C.D|X:X::X:X|WORD)：name of neighbor address or neighbor group for

BGP

Command Mode: BGP protocol unicast address family mode and VRF address family mode.

Default: Do not configure GR.

Usage Guide: None

Example: Configure that GR capability is sent to neighbor 1.1.1.1.

Switch(config-router)#neighbor 1.1.1.1 capability graceful-restart

12.6 neighbor restart-time

Command: neighbor (A.B.C.D | X:X::X:X | WORD) restart-time <1-3600>
          no neighbor (A.B.C.D | X:X::X:X | WORD) restart-time <1-3600>

Function: Configure restart-time for neighbors, no command restores the default time.

Parameter: (A.B.C.D|X:X::X:X|WORD)：name of neighbor address or neighbor group for

BGP

          <1-3600>：time in seconds.

Command Mode: BGP protocol unicast address family mode and VRF address family mode.

Default: The default restart-time is 120s for neighbor.

Usage Guide: None.

Example: Configure restart-time as 60s for neighbor 1.1.1.1.

Switch(config-router)# neighbor restart-time 60

Chapter 13 Commands for OSPF GR

13.1 capability restart graceful

Command: capability restart graceful

        no capability restart

Function: Enable GR of specified OSPF process, no command disables this function.

Parameter: None.

Command mode: OSPF protocol configuration mode

Default: Enable OSRF GR function.

Usage Guide: When a switch is using OSPF GR, it will quit GR directly if disable GR.

Example: Enable OSPF GR function.

Switch(config)#router ospf

Switch(config-router)#capability restart graceful

13.2 debug ospf events gr

Command: debug ospf events gr

        no debug ospf events gr

Function: Enable the debugging for displaying relevant event of OSPF GR, no command disables the debugging.

Parameter: None.

Command mode: Admin mode

Default: Disable.

Usage Guide: None.

Example: Enable the debugging for displaying relevant event of OSPF GR.

Switch#debug ospf events gr

13.3 ospf graceful-restart grace-period

Command: ospf graceful-restart grace-period <integer>

        no ospf restart grace-period

Function: Configure grace period of GR restarter, no command restores grace period to default value.

Parameter: *<integer>*: value of grace period, unit is second and ranging from 1 to 1800.

1

Command mode: Global configuration mode

Default: 60s.

Usage Guide: Configure grace period of GR restarter (The switch processes switchover or restart protocol). GR process should be completed during a grace period. If it does not complete GR process in time, it should quit GR forcibly and restart OSPF normally.

Example: Configure grace period of GR restarter to 100s.

Switch(config)#ospf graceful-restart grace-period 100

13.4 ospf graceful-restart helper max-grace-period

Command: ospf graceful-restart helper max-grace-period <*integer*>
          no ospf graceful-restart helper

Function: One of GR helper policies. Configure the maximum grace period supported by helper. The no command deletes all configured helper policies.

Parameter: <*integer*>: value of grace period, unit is second and ranging from 1 to 1800.

Command mode: Global configuration mode

Default: Do not limit grace period supported by helper.

Usage Guide: If grace period set by GR restarter is bigger than max-grace period configured by helper, helper will not help restarter to complete GR. The no command deletes all helper policies.

Example: Configure the maximum grace period allowed by GR helper to 100s.

Switch(config)#ospf graceful-restart helper max-grace-period 100

13.5 ospf graceful-restart helper never

Command: ospf graceful-restart helper never
          no ospf graceful-restart helper

Function: One of GR helper policies. Configured the switch can not work as OSPF GR helper. The no command deletes all configured helper policies.

Parameter: None.

Command mode: Global configuration mode

Default: Switch can work as GR helper.

Usage Guide: After configure the policy, switch can only work as GR restarter (a switch processes switchover and restart protocol), not GR helper (a switch helps restarter to complete GR).

Example: Configure that switch cannot work as OSPF helper.

Switch(config)#ospf graceful-restart helper never

13.6 show ip ospf

Command: show ip ospf [<process-id>]

Function: Show main information of OSPF, including whether it supports GR and it can works as GR helper, the configured grace period and so on.

Parameter: <process-id>: Process ID, ranging from 0 to 65535. It means that show main OSPF information of all processes when there is no parameter configured.

Command Mode: Admin mode

Default: None.

Usage Guide: None.

Example: Show main OSPF information of all processes.

Switch#show ip ospf

Routing Process "ospf 0" with ID 192.168.40.69

  Process bound to VRF default

  Process uptime is 52 minutes

Conforms to RFC2328, and RFC1583Compatibility flag is disabled

  Supports only single TOS(TOS0) routes

  Supports opaque LSA

  Supports Graceful Restart

  Supports helper mode for Graceful Restart

  Grace period for Graceful Restart 100 secs

  SPF schedule delay 5 secs, Hold time between two SPFs 10 secs

  Refresh timer 10 secs

  Number of external LSA 0. Checksum Sum 0x000000

  Number of opaque AS LSA 0. Checksum Sum 0x000000

  Number of non-default external LSA 0

  External LSA database is unlimited.

  Number of LSA originated 0

  Number of LSA received 0

Number of areas attached to this router: 0

Display	Description
Supports Graceful Restart	Switch supports OSPF GR
Supports helper mode for Graceful Restart	Switch supports helper mode of OSPF GR
Grace period for Graceful Restart 100 secs	Switch configures OSPF GR Grace Period to 100s

13.7 show ip ospf graceful-restart

Command: show ip ospf [<process-id>] graceful-restart

Function: Show the state of OSPF GR, including whether it is processing GR at helper mode, GR remaining time.

Parameter: <process-id>: Process ID, ranging from 0 to 65535. It means that GR state of all processes shown when there is no parameter configured.

Command Mode: Admin mode

Default: None.

Usage Guide: None.

Example: Show GR state of all processes on GR restarter.

Switch#show ip ospf graceful-restart

OSPF process 0 graceful-restart information：

GR status   :GR in progress

GR remaining time : 50

Display	Description
OSPF process 0 graceful-restart information	OSPF GR state in process 0.
GR status	GR state of GR, GR in progress means switch is processing GR
GR remaining time	Remaining time of GR

Show GR state of all processes on GR helper:

Switch#show ip ospf graceful-restart

OSPF process 0 graceful-restart information:

GR status :Helper

Neighbor ID	Interface	Remaining time
1.1.1.1	Vlan1	100
2.2.2.2	Vlan1	200

Display	Description
OSPF process 0 graceful-restart information	OSPF GR state of process 0.
GR status	GR state, Helper means switch is in helper mode

Neighbor ID	The router-id of restarter helped
Interface	The layer 3 interface connected with restarter
Remaining time	Remaining time of GR