

Reliability Configuration Commands

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1.1. link state group

Use this command to add the port into the specified link state track group. The **no** form of this command is used to delete a port from the specified link state track group.

```
link state group num { upstream | downstream }
```

```
no link state group
```

Parameter Description

Parameter	Description
<i>num</i>	ID of the link state track group.
upstream	Configures the port to be an upstream port in the link state track group.
downstream	Configures the port to be a downstream port in the link state track group.

Defaults

The port is not added into any link state track group.

Command Mode

Interface configuration mode.

Configuration Guide

First create a link state track group and then add a port into the specified link state track group.

Configuration Examples

The following example shows how to add the port fa0/2 into the link state track group:

```
QTECH(config)# link state track
1 QTECH(config)# interface fa
0/2
QTECH(config-if)# link state group 1 upstream
```

Related Commands



Command	Description
link state track	Enables a link state track group.

Platform Description

N/A.

1.2. link state track

Use this command to enable the link state track group. The **no** form of this command is used to disable a link state track group

link state track [*num* | **up-delay timer**]

no link state track [*num*]

Parameter Description

Parameter	Description
<i>num</i>	Interface ID of the link aggregation group.
up-delay timer	Delay time for link up. By default, there is no delay for link up.

Defaults N/A.

Command Mode

Global configuration mode.

Usage Guide

First create a link state track group and then add a port into the specified link state track group.

Configuration Examples

```
QTECH(config)# link state track 1
```

The following example shows how to create a link state track group:

Related Commands

Platform Description

The following example shows how to create a link state track group and set the down link to become up after 30s when uplink becomes up:


```
QTECH(config)# link state track 1 up-delay 30
```

Command	Description
link state group	Adds the port to the specified link state track group.

N/A.

1.3. mac-address-table move update max-update-rate

Use this command to configure the maximum number of MAC address update packets sent per second.

mac-address-table move update max-update-rate *pkts-per-second*

no mac-address-table move update max-update-rate

Parameter Description

Parameter	Description
<i>pkts-per-second</i>	The maximum number of MAC address update packets sent per second. It ranges from 0 to 32000, and the default value is 150.

Defaults

A maximum of 150 MAC address update packets are sent per second.

Command

Global configuration mode.

Mode

Usage Guide

When a link is switched, REUP sends a certain number of MAC address update packets to an uplink device in every second to recover downlink data transmission of the uplink device.

Configuration Examples

Related Commands

Platform Description

The following example shows how to configure the maximum number of MAC address update packets sent per second:

```
QTECH(config)# mac-address-table move update max-update-rate20
```

Command	Description
N/A.	N/A.

N/A.

1.4. mac-address-table move update receive

Use this command to enable REUP to receive the mac-address-table update messages.

mac-address-table move update receive

no mac-address-table move update receive

Parameter Description

Parameter	Description
N/A.	N/A.

Defaults

Disabled.

Command Mode

Global configuration mode.

Usage Guide

The dual link backup switchover will lead to the loss of downstream data flow, for the MAC address for the uplink switch has not been updated in time. Therefore, it is necessary to update the MAC address table of the uplink switch, to reduce the loss of L2 data flow. You need to enable the switch of receiving the MAC address update messages on the uplink switch.

Configuration Examples

Command	Description
<code>mac-address-table move update transit</code>	Enables REUP to transmit the mac-address-table update messages.

Related Commands

```
QTECH(config)# mac-address-table move update receive
```

Platform Description

N/A.

1.5. mac-address-table move update receive vlan

Use this command to configure the VLANs processing MAC address update packets.

`mac-address-table move update receive vlan vlan-range`

`no mac-address-table move update receive vlan vlan-range`

Parameter Description

Parameter	Description
<i>vlan-range</i>	Range of the VLANs processing MAC address update packets.

Defaults

All VLANs process MAC address update packets.

Command Mode

Global configuration mode.

Usage Guide

This command can be used to disable some VLANs from processing MAC address update packets.

VLANs disabled from processing MAC address update packets can still recover downlink data transmission of the uplink device using MAC address update packets, but the capability to provide convergence on link failure will be degraded.

Configuration Examples

Related Commands

Platform Description

The following example configures VLANs processing MAC address update packets:

```
QTECH(config)# no mac-address-table move update receive vlan20
```

Command	Description
mac-address-table move update receive	Enables REUP to receive MAC address update packets.

N/A.

1.6. mac-address-table move update transit

Use this command to enable REUP to transmit the mac-address-table update messages.

mac-address-table move update transit

no mac-address-table move update transit

Parameter Description

Parameter	Description
N/A.	N/A.

Defaults

Disabled.

Command Mode

Global configuration mode.

Usage Guide

In order to reduce the link switchover and the loss of the downstream data flow, it is necessary to enable the switch of receiving the MAC address update messages on the uplink switch.

Configuration Examples

Related Commands

Platform Description

```
QTECH(config)# mac-address-table move update transit
```

Command	Description
mac-address-table move update transit vlan	Enables REUP to transmit the mac-address-table update messages.

N/A.

1.7. mac-address-table move update transit vlan

Use this command to enable REUP to transmit the mac-address update messages.

```
mac-address-table move update transit vlan vid
```

```
no mac-address-table move update transit vlan
```

Parameter Description

Parameter	Description
<i>vid</i>	ID of the VLAN transmitting MAC address update packets.

Defaults

Transmit the MAC-address update messages in the default VLAN on the port.

Command Mode

Interface configuration mode.

Usage Guide

When a link is switched, the VLAN enabled to transmit MAC address update packets will send MAC address update packets to its uplink device.

Configuration Examples

Related Commands

Command	Description
<code>mac-address-table move update transit</code>	Enables REUP to receive the

The following example configures VLANs transmitting MAC address update packets:

```
QTECH(config)# mac-address-table move update transit
```

	mac-address-table update messages.
--	------------------------------------

Platform Description

N/A.

1.8. mac-address-table update group

Use this command to set the mac-address-table update group.

```
mac-address-table update group [ group-num ]
```

```
no mac-address-table update group
```

Parameter Description

Parameter	Description
<i>group-num</i>	The mac-address-table update group ID.

Defaults

By default, no mac-address-table update group is configured.

Command Mode

Interface configuration mode.

Usage Guide

In order to reduce the flood due to the MAC address update and the influence on the normal data transmission of the switch, QTECH products add a configuration of MAC address update group. Only if all the interfaces are added to a MAC address update group, the downstream data transmission be

restored rapidly.

Configuration Examples

Related Commands

Platform Description

```
QTECH(config-if)# mac-address-table update group2
```

Command	Description
show mac-address-table update group detail	Displays the mac-address-table update group information.

N/A.

1.9. switchport backup interface *interface-id*

Use this command to configure the REUP dual link backup interface.

```
switchport backup interface interface-id
```

```
no switchport backup
```

Parameter

Description

Parameter	Description
interface-id	Interface ID of the backup link.

Defaults

N/A.

Command Mode

Interface configuration mode.

Usage Guide

Enter the primary interface configuration mode, the *interface-id* in the parameter is for the backup interface. When the active link fails, the backup link transmission is restored rapidly

Configuration Examples

The following example shows how to set the dual link backup, with fa 0/1 and fa 0/2 as primary interface and backup interface:

```
QTECH(config)# interface fa 0/1
QTECH(config-if)# switchport backup interface fa 0/2
```

Related Commands

Command	Description
<code>show interface switchport backup</code>	Displays the dual link backup configuration on the switch.

Platform Description

N/A.

1.10. switchport backup interface preemption

Use this command to configure the REUP link preemption function.

switchport backup interface *interface-id* **preemption mode** { **forced** | **bandwidth** | **off** }

switchport backup interface *interface-id* **preemption delay** *delay-time*

no switchport backup interface *interface-id* **preemption delay**

Parameter Description

Parameter	Description
<i>interface-id</i>	The interface id of the backup link.
<i>delay-time</i>	The preemption delay time.

Defaults

The preemption function is disabled by default.

The default preemption delay time is 35s.

Command Mode

Interface configuration mode.

Usage Guide

The preemption mode includes **forced**, **bandwidth** and **off**. In the **bandwidth**

1. REUP Commands

preemption mode, the interface with high bandwidth has priority over other interfaces to transmit the data. In the **forced** preemption mode, the primary has priority over backup interfaces to transmit the data. No preemption event occurs in the **off** preemption mode. By default, the preemption mode is off.

The preemption delay refers to the delay time of the link switchover after the restoration of the link failure.

Configuration Examples

The following example shows how to set the dual link backup, with fa 0/1 and fa 0/2 as the primary interface and backup interface, set the bandwidth preemption mode and 40s preemption delay:

```
QTECH(config)# interface fa 0/1
QTECH(config-if)# switchport backup interface fa 0/2 preemption mode bandwidth
QTECH(config-if)# switchport backup interface fa 0/2
preemption delay 40
```

Related Commands

Command	Description
show interface switchport backup	Displays the dual link backup configuration.

Platform Description

N/A.

1.11. switchport backup interface prefer

Use this command to configure VLAN load balancing on a link. The **no** form of this command is used to delete the configured VLAN load strategy.

switchport backup interface *interface-id* **prefer** **instance** *instance-range*
no switchport backup interface *interface-id* **prefer**

Parameter Description

Parameter	Description
<i>interface-id</i>	Interface ID of the backup link.

<i>instance-range</i>	Instance range of loading on the backup interface.
-----------------------	--

Defaults

No VLAN load on the backup interface.

Command Mode

Interface configuration mode.

Usage Guide

MSTP instance mapping can be used to modify the mapping between an instance and a VLAN.

```
QTECH(config)# interface gigabitEthernet 0/1
QTECH(config-if)# switchport backup interface gigabitEthernet 0/2 prefer
instance 1
```

Configuration Examples

The following example configures VLAN load balancing on dual links.

Related Commands

Command	Description
show interface switchport backup	Displays the configuration of dual-link backup on the switch.
spanning-tree mst configuration	Configures MSTP instances.

Platform Description

N/A.

1.12. show interfaces switchport backup

Use this command to display the dual link backup information on the interfaces.

show interfaces [*interface-id*] switchport backup [*detail*]

Parameter Description

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



<i>interface-id</i>	The interface id of the dual link backup.
detail	Displays the detailed information about the dual link backup.

Defaults

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A.

Configuration Examples

```
QTECH # show interfaces switchport backup detail Switch Backup Interface Pairs:
Active Interface Backup Interface State
Gi0/23 Gi0/24 Active Up/Backup Standby
Interface Pair : Gi0/23, Gi0/24
Preemption Mode : Off
Preemption Delay : 35 seconds
Bandwidth : Gi0/23(1000 Mbits), Gi0/
```

Related Commands

Command	Description
N/A.	N/A.

Platform Description

N/A.

1.13. show link state group

Use this command to display the information of a link state track group.

show link state group

Parameter Description

Parameter	Description
N/A	N/A



Defaults

N/A.

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A.

Configuration Examples

The following example displays the link state track group:

```
QTECH # show link state group
Link State Group:1 Status: Enabled, UP Upstream Interfaces :Gi0/1(Up)
Downstream Interfaces :Gi0/3(Dwn), Gi0/4(Dwn) Link State Group:2 Status:
Disabled, Down Upstream Interfaces :
Downstream Interfaces :
(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
```

Related Commands

Command	Description
N/A.	N/A.

Platform Description

N/A.

1.14. show mac-address-table move update

Use this command to display the statistics about the MAC address updates tranceived on the interface.

show mac-address-table move update**Parameter Description**

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide N/A.

Configuration Examples

```

QTECH#show mac-address-table move update
Mac address table move update status:
Transit:disable
Receive:disable
Max-update-rate:150
Receive vlan:1-4094

Pair: Ag1,Ag2
Members          Status    Transit Count    Transit VLAN    Last Transit
Time
-----
Ag1              Down     0
Ag2              Down     0
Pair: Ag3,Gi0/6
Members          Status    Transit Count    Transit VLAN    Last Transit
Time
-----
Ag3              Down     0
Gi0/6           Down     0
Pair: Gi0/1,Gi0/2
Members          Status    Transit Count    Transit VLAN    Last Transit
Time
-----
Gi0/1           Up       0
Gi0/2           Standby  0

```

Related Commands

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



N/A.	N/A.
------	------

Platform Description

N/A.

1.15. show mac-address-table update group

Use this command to display the mac-address-table update group information.

show mac-address-table update group [detail]

Parameter Description

Parameter	Description
detail	Displays the detailed information about the mac-address-table update group.

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A.

Configuration Examples

```
QTECH # configure terminal
QTECH (config)# mac-address-table move update receive
QTECH (config)# interface range gigabitEthernet 0/3-4
QTECH (config-if-range)# mac-address-table update group
QTECH (config-if-range)# end
QTECH # show mac-address-table update group detail
Mac-address-table Update Group:1
Received mac-address-table update message count:7
Group member Receive Count Last Receive Switch-ID Receive Time
-----
GigabitEthernet 0/3 0          0000.0000.0000
GigabitEthernet 0/4 0          0000.0000.0000
```

Related Commands

Command	Description
N/A.	N/A.

Platform Description

N/A.

2.1. rldp detect-interval

Use this command to configure the interval at which the RLDP sends the detection message on the port. Use the **no** form of this command to restore the default value.

rldp detect-interval *interval*

no rldp detect-interval

Parameter Description

Parameter	Description
<i>interval</i>	Detection interval in the range 2 to 15 seconds

Defaults

3 seconds.

Command Mode

Global configuration mode.

Usage Guide

In the environment where STP is enabled, it is recommended that the product of interval multiplying the maximum number of detections is less than the topology convergence time of STP.

Configuration Examples

Related Commands

Platform Description

The following example shows how to set the detection interval as 5s:

```
QTECH(config)# rldp detect-interval 5
```


Command	Description
rldp detect-max	Sets the maximum number of detections.

N/A.

2.2. rldp detect-max

Use this command to set the maximum number of sending detection packets on the port. If the neighboring port does not respond when this detection number is exceeded, the link is considered faulty. Use the **no** form of this command to restore it to the default value.

rldp detect-max *num*

no rldp detect-max

Parameter Description

Parameter	Description
<i>num</i>	Maximum number of detections in the range 2 to 10

Defaults

2.

Command Mode

Global configuration mode.

Usage Guide

This command is used together with the detection interval to specify the maximum number of detections.

Configuration Examples

Related Commands

Platform Description

The following example shows how to set the maximum number of detections as 5:

```
QTECH(config)# rldp detect-max 5
```

Command	Description
rldp detect-interval	Sets the detection interval.

N/A.

2.3. rldp enable

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

rldp enable

no rldp enable

Parameter Description

Parameter	Description
N/A.	N/A.

Defaults

Disabled.

Command Mode

Global configuration mode.

Usage Guide

You can enable RLDP on the interface only when the global RLDP is enabled.

Configuration Examples

Related Commands

Command	Description
rldp port	Enables the RLDP function on the port.

The following example shows how to enable RLDP:

```
QTECH(config)# rldp enable
```

Platform

N/A.

2.4. rldp neighbor-negotiation

Use this command to enable RLDP neighbor negotiation. Use the **no** form or **default** form of this command to restore the default setting.

rldp neighbor-negotiation

no rldp neighbor-negotiation

default rldp neighbor-negotiation

Parameter Description

Parameter	Description
N/A.	N/A.

Defaults

RLDP neighbor negotiation is disabled by default.

Command Mode

Global configuration mode.

Usage Guide

With neighbor negotiation enabled, RLDP unidirectional-/bidirectional-link detection starts only after the neighbor negotiation is successful. (Receiving the Prob message from the neighbor indicates the neighbor negotiation is successful.)

Configuration Examples

```
QTECH#config
QTECH(config)#rldp neighbor-negotiation
```

The following example shows how to enable RLDP neighbor negotiation:

Related Commands

Command	Description
<code>rldp port</code>	Enables the RLDP function on the port.

Platform Description

N/A.

2.5. rldp port

Use this command to enable RLDP on the port and specify detection type and troubleshooting method. Use the **no** form of this command to disable the function.

```
rldp port { unidirection-detect | bidirection-detect | loop-detect } { warning | shutdown-svi |
```

```
shutdown-port | block }
```

```
no rldp port { unidirection-detect | bidirection-detect | loop-detect }
```

Parameter

Parameter	Description
unidirection-detect	Sets unidirectional link detection.
bidirection-detect	Sets bidirectional link detection.
loop-detect	Sets loop detection type.
warning	Warns the user.
shutdown-svi	Shut downs the SVI the port belongs to.
shutdown-port	Shut downs the port.
block	Disables learning and forwarding of a port.

Defaults

N/A

Command Mode

Interface configuration mode.

Usage Guide

The RLDP detection on the port takes effect only when the global RLDP is enabled.

Configuration Examples

The following example shows how to enable the RLDP detection and specify the failure treatment as block.

```
QTECH(config)# interface GigabitEthernet 2/0/9
```

Related Commands

Command	Description
<code>rldp enable</code>	Enables RLDP globally.

Platform Description

N/A.

2.6. rldp reset

Use this command to make all the ports that have been handled using `rldp shutdown` or `disable` to perform RLDP detection again.

rldp reset

Parameter Description

Parameter	Description
N/A.	N/A.

Defaults

N/A.

Command Mode

Privileged EXEC mode.

Usage Guide

This command is used to recover the faulty port. The **errdisable recovery** can be also used for the purpose. For details, refer to the *Configuring Interface* chapter.

Configuration Examples

Related Commands

Platform Description

The example below demonstrates how to use this command:

```
QTECH# rldp reset
```

Command	Description
rldp enable	Enables RLDP globally.

N/A.

2.7. show rldp

Use this command to display the RLDP information.

```
show rldp [ interface interface-id ]
```

Parameter Description

Parameter	Description
<i>interface-id</i>	Interface ID

Defaults

N/A.

Command Mode

Privileged EXEC mode.

Usage Guide



N/A.

Configuration Examples

Related Commands

Platform Description

N/A.

Command	Description
N/A.	N/A.

N/A.

3.1. show vrrp

Use this command to display the VRRP information.

show [ipv6] vrrp [brief | group]

Parameter Description

Parameter	Description
ipv6	(Optional) Applies to IPv6 VRRP.
brief	(Optional) Displays the brief of the VRRP group.
<i>group</i>	Number of the VRRP group to be displayed

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

If no optional parameter is used, the information of all VRRP groups is displayed.

Configuration Examples

The following example displays the information of all VRRP groups.

```
QTECH# show vrrp GigabitEthernet 0/0 - Group
1 State is Backup
Virtual IP address is 192.168.201.1 configured Virtual MAC
address is 0000.5e00.0101 Advertisement interval is 3 sec
Preemption is enabled min delay is 0
sec Priority is 100
Master Router is 192.168.201.213 , priority is 120 Master
Advertisement interval is 3 sec
Master Down interval is 10.82 sec
GigabitEthernet 0/0 - Group 2 State is Master
Virtual IP address is 192.168.201.2 configured Virtual MAC
address is 0000.5e00.0102 Advertisement interval is 3 sec
Preemption is enabled min delay is 0
sec Priority is 120
Master Router is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
```



```

Master Down interval is 10.59 sec QTECH#show
ipv6 vrrp GigabitEthernet 0/13 - Group 1
  State is Master
  Virtual IPv6 address is as follows: FE80::2
    1::2
  Virtual MAC address is 0000.5e00.0201 Advertisement
  interval is 1 sec Accept_Mode is enabled
  Preemption is enabled min delay is 0
    sec
  Priority is 100
  Master Router is FE80::1 (local), priority is 100 Master
  Advertisement interval is 1 sec
  Master Down interval is 3.60 sec

```

Related

Command	Description
<code>vrrp group ip <i>ipaddress</i> [secondary]</code>	Enables the VRRP function and set the IP address for the virtual device.

Commands

Platform Description

N/A

3.2. show vrrp interface

Use this command to display the information of the VRRP on the interface.

`show [ipv6] vrrp interface type number [brief]`

Parameter Description

Parameter	Description
<code>ipv6</code>	(Optional) Applies to IPv6 VRRP.
<code>type</code>	Interface type
<code>number</code>	Interface number
<code>brief</code>	(Optional) Displays the brief of the VRRP group on the interface.

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A

Configuration Examples

The following example displays the VRRP information on Ethernet interface E1/0.

```
QTECH# show vrrp interface fastethernet 0/0
```

```
FastEthernet 0/0 - Group 1 State is
Backup
Virtual IP address is 192.168.201.1 configured Virtual MAC
address is 0000.5e00.0101 Advertisement interval is 3 sec
Preemption is enabled min delay is 0
sec Priority is 100
Master Device is 192.168.201.213 , priority is 120 Master
Advertisement interval is 3 sec
Master Down interval is 9 sec FastEthernet
0/0 - Group 2 State is Master
Virtual IP address is 192.168.201.2 configured Virtual MAC
address is 0000.5e00.0102 Advertisement interval is 3 sec
Preemption is enabled min delay is 0
sec Priority is 120
Master Device is 192.168.201.217 (local), priority is 120 Master
Advertisement interval is 3 sec
Master Down interval is 9 sec
```

Related Commands

Command	Description
<code>vrrp group ip ip address [secondary]</code>	Enables the VRRP function and set the IP address for the virtual device

Platform Description

N/A

3.3. show vrrp packet statistics

Use this command to display the statistics of the VRRP packet transmission.

show vrrp packet statistics [*interface-type interface-number*]

Parameter Description

Parameter	Description
<i>interface-type</i> <i>interface-number</i>	Interface type and number

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A

Configuration Examples

The following example displays the statistics of VRRP packet transmission on all interfaces.

```
QTECH# show vrrp packet statistics
```

```
Total
```

```
InReceives: 966043 packets, InOctets: 38641824, InErrors: 38826
```

```
OutTransmits: 306079, OutOctets: 7798564
```

```
GigabitEthernet 3/0/1
```

```
InReceives: 799665 packets, InOctets: 31986600, InErrors: 19657
```

```
OutTransmits: 272931, OutOctets: 6675320
```

```
GigabitEthernet 3/0/2
```

```
InReceives: 0 packets, InOctets: 0, InErrors: 0
```

```
OutTransmits: 681, OutOctets: 16344
```

```
QTECH#show vrrp packet statistics gigabitEthernet 3/0/1 GigabitEthernet
```

```
3/0/1
```

```
InReceives: 799911 packets, InOctets: 31996440, InErrors: 19657
```

```
OutTransmits: 273053, OutOctets: 6677760
```

The following example displays the statistics of VRRP packets on the interface gigabitEthernet 3/0/1.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

3.4. vrrp accept_mode

Use this command to enable the packet accepting function on the IPv6 VRRP virtual router. Use the **no** form of this command to disable this function.

vrrp ipv6 group accept_mode**no vrrp ipv6 group accept_mode****Parameter Description**

Parameter	Description
<i>group</i>	VRRP group number

Defaults

The master IPv6 VRRP is not allowed to accept packets whose destination IPv6 address is the IPv6 address of a virtual router. However, the NA and NS packets should be accepted regardless of the configuration of Accept_Mode. Also, the master IPv6 VRRP virtual router in the owner state will accept and process any packets whose destination IPv6 address is the IPv6 address of a virtual router, regardless of the configuration of Accept_Mode.

Command

Interface configuration mode

Mode**Usage Guide**

Configuration of the network interface is effective for the master virtual router.

ly IPv6 VRRP has this configuration mode

Configuration Examples

The following example enables the accept mode on the group 1.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1
QTECH(config-if-GigabitEthernet 0/0)# vrrp ipv6 1 accept_mode
```

Platform Description

N/A

3.5. vrrp authentication

Use this command to enable VRRP authentication.

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

vrrp group authentication string

no vrrp group authentication

Parameter Description

Parameter	Description
<i>group</i>	VRRP group number
<i>string</i>	String for the VRRP group authentication (within 8 bytes, plaintext password)

Defaults

This function is disabled by default. Even if the VRRP function is enabled, no authentication password is configured by default.

Command Mode

Interface configuration mode

Usage Guide

In a VRRP group, the same authentication password should be configured for routers. The plain text authentication password cannot guarantee security but only prevents/prompts wrong VRRP configurations. This command is only applicable to VRRPv2 instead of VRRPv3.

3. VRRP Commands

Authentication is abolished for VRRPv3 (IPv4 VRRP and IPv6 VRRP) packets. If VRRPv2 is chosen

for an IPv4 VRRP group, the command is effective; if VRRPv3 is chosen, the command is ineffective.

Configuration Examples

The following example sets the authentication password for VRRP group 1.

```
QTECH#configure terminal
QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch.
QTECH(config-if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 authentication x30dn78k
```

Platform Description

N/A

3.6. vrrp bfd (Interface Configuration Mode)

Use this command to enable BFD correlation for the specified IPv4 VRRP group.

Use the **no** form of this command to remove the BFD correlation for the specified IPv4 VRRP group.

vrrp group bfd ip-address

no vrrp group bfd ip-address

Parameter Description

Parameter	Description
<i>group</i>	VRRP group ID
<i>ip-address</i>	Neighbor IP address

Defaults

By default, no BFD correlation is configured for the IPv4 VRRP group on the interface.

Command Mode

Interface configuration mode.

Usage Guide

After the global BFD correlation for IPv4 VRRP is configured, the BFD correlation configuration for the IPv4 VRRP groups will be removed.

The IP address and BFD session of the interface must be configured before configuring the **vrrp bfd** command.

Configuration Examples

The following example enables BFD correlation for the VRRP group. On Switch 1:

```
QTECH#configure terminal
QTECH(config)#interface vlan 1
QTECH(config-if-VLAN 1)#ip address 1.1.1.2 255.255.255.0
QTECH(config-if-VLAN 1)#bfd interval 50 min_rx 50 multiplier 3
QTECH(config-if-VLAN 1)#vrrp 1 ip 1.1.1.1
QTECH(config-if-VLAN 1)#vrrp 1 bfd 1.1.1.3
```

On Switch 2:

```
QTECH#configure terminal
```

```
QTECH(config)#interface vlan 1
QTECH(config-if-VLAN 1)#ip address 1.1.1.3 255.255.255.0
QTECH(config-if-VLAN 1)#bfd interval 50 min_rx 50 multiplier 3
QTECH(config-if-VLAN 1)#vrrp 1 ip 1.1.1.1
QTECH(config-if-VLAN 1)#vrrp 1 bfd 1.1.1.2
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

3.7. vrrp bfd (Global Configuration Mode)

Use this command to enable the global BFD correlation for the IPv4 VRRP backup group to detect the master router status.

Use the **no** form of this command to remove the BFD correlation for IPv4 VRRP.

vrrp bfd *interface-type interface-number ip-address*

no vrrp bfd

Parameter Description

Parameter	Description
<i>interface-type</i> <i>interface-number</i>	Interface type and interface number
<i>ip-address</i>	Neighbor IP address

Defaults

By default, the global BFD correlation for IPv4 VRRP is disabled.

Command Mode

Global configuration mode

Usage Guide

After the global BFD correlation for IPv4 VRRP is configured, the BFD correlation configuration for the IPv4 VRRP groups will be removed.

The global BFD correlation for IPv4 VRRP configured later will override the earlier configuration. The IP address and BFD session of the interface must be configured before configuring the `vrrp bfd` command.

The global IPv4 VRRP BFD session applies to the IPv4 VRRP router which is consists of two devices only.

Configuration Examples

The following example enables global BFD correlation for IPv4 VRRP.

```
QTECH#configure terminal
QTECH(config)#interface vlan 1
QTECH(config-if-VLAN 1)#ip address 192.168.201.11 255.255.255.0
QTECH(config-if-VLAN 1)#bfd interval 50 min_rx 50 multiplier 3
QTECH(config-if-VLAN 1)#exit
```

Related Commands

Platform Description

```
QTECH(config)# vrrp bfd vlan 1 192.168.201.10
```

Command	Description
N/A	N/A

N/A

3.8. vrrp delay

Use this command to set the reload latency of the VRRP group on the interface. Use the **no** form of this command to restore the default setting.

```
vrrp delay { minimum min-seconds | reload reload-seconds }
```

```
no vrrp delay
```

Parameter Description

Parameter	Description
minimum <i>min-seconds</i>	When the interface is up, VRRP group shall be reloaded after at least <i>min-seconds</i> .
reload <i>reload-seconds</i>	The reload latency of the VRRP group. If the configured <i>min-seconds</i> is greater than <i>reload-seconds</i> , the actual reload latency of the VRRP group will be <i>min-seconds</i> .

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

After the delay is configured for a VRRP group on an interface, the VRRP group starts after the delay instead of immediately upon system startup or the interface's resumption, ensuring non-preemption. If the interface receives a VRRP packet during the delay, the delay will be canceled and the VRRP will be started immediately. The two types of delay share a value range of 0 to 60 seconds. This configuration will be effective for both IPv4 and IPv6 VRRP groups of an interface.

Configuration Examples

The following example sets the VRRP reload latency on E0 to 10 seconds.

When E0 is up, VRRP group 1 shall be reloaded in 10 seconds.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#vrrp delay minimum 10 reload 10 QTECH(config-if-GigabitEthernet
0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

3.9. vrrp description

Use this command to specify a descriptor for the VRRP.

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

vrrp [ipv6] group description text

no vrrp [ipv6] group description

Parameter Description

Parameter	Description
ipv6	Applies to IPv6 VRRP.
<i>group</i>	VRRP group number
<i>text</i>	VRRP group descriptor

Defaults

This function is disabled by default. Even if the VRRP function is enabled, no VRRP group descriptor is configured by default.

Command Mode

Interface configuration mode

Usage Guide



This command will set the descriptor for the VRRP group to facilitate the identification of the VRRP group.

Configuration Examples

The following example labels the VRRP group 1 on Ethernet interface E0 as Building A – Marketing and Administration.

```
QTECH#configure terminal
QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 description "Building A - Marketing and Administration"
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ipv6 fe80::1
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 description "Building B - Marketing and Administration"
```

Related Commands

Command	Description
<code>vrrp group ip ip-address [secondary]</code>	Enables the VRRP function and set the IP address for the virtual device

Platform

N/A

Description

3.10. vrrp ip

Use this command to enable VRRP on the interface and specify the related virtual IP address. Use the **no** form of this command to restore the default setting.

`vrrp group ip ipaddress [secondary]`

`no vrrp group ip ipaddress [secondary]`

Parameter Description

Parameter	Description
<code>group</code>	VRRP group number of the virtual device

<i>ipaddress</i>	IP address of the virtual device
secondary	Specifies the secondary IP address of the virtual device.

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

If the **secondary** parameter is not used, the IP address set here will become the master IP address of the virtual device.

Configuration Examples

The following example enables the VRRP function on Ethernet interface 0. The VRRP group number is 1, primary IP address of the virtual device is 10.0.1.20 and secondary IP address is 10.0.2.20.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#ip address 10.0.2.1 255.255.255.0 secondary
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.2.20 secondary
```

Related Commands

Command	Description
show vrrp [brief group]	Displays the VRRP configuration.

Platform Description

N/A

3.11. vrrp ipv6

Use this command to enable IPv6 VRRP on the interface and specify the related virtual IPv6 address. Use the **no** form of the command to restore the default setting.

Parameter Description

`vrrp group ipv6 ipv6-address`

`no vrrp group ip ipv6-address`

Parameter	Description
<code>group</code>	VRRP group number of the virtual device
<code>ipv6-address</code>	IPv6 address of the virtual device

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

IPv6 VRRP and IPv4 VRRP share group numbers ranging from 1 to 255. One VRRP group number of an interface is applicable to both IPv4 VRRP and IPv6 VRRP at the same time. The first configured address should be the link's local address, which cannot be deleted until the other virtual addresses are deleted.

Configuration Examples

The following example enables the IPv6 VRRP function on Ethernet interface FastEthernet 0/0 with VRRP group number 1 and virtual IPv6 address FE80::1 and 2001::1.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ipv6 2001::1
```

Related Commands

Command	Description
<code>show ipv6 vrrp [brief group]</code>	Displays the IPv6 VRRP configuration.

Platform Description

N/A

3.12. vrrp preempt

Use this command to set the preemption mode of the VRRP group. Use the **no** form of this command to restore the default setting. **vrrp [ipv6] group preempt**

[delay seconds]

no vrrp [ipv6] group preempt [delay]

Parameter Description

Parameter	Description
ipv6	Applies to IPv6 VRRP.
group	VRRP group number
delay seconds	(Optional) Specifies the delay before a device declares itself master. The default value is 0.

Defaults

This function is disabled by default. Once the VRRP function is enabled, the VRRP group will work in the preemption mode by default.

Command Mode

Interface configuration mode

Usage Guide

If the VRRP group is working in the preemption mode, once a device finds its priority is higher than the priority of the master, it will become the master device

of the VRRP group. If the VRRP group is not working in the preemption mode, even if a device finds its priority is higher than the master's priority, it will not become the master device of the VRRP group. In case the VRRP group is using the Ethernet interface IP address, the setting of the preemption mode does not make sense, because that VRRP group has the highest priority and thus automatically becomes the master device in the VRRP group.

Configuration Examples

The following example enables IPv4 VRRP on interface GigabitEthernet 0/0. When VRRP group 1 finds its priority (200) is higher than that of the current master device, it will declare its preemption of master after a delay of 15 seconds.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 preempt delay 15
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 priority 200
```

The following example enables IPv4 VRRP on interface GigabitEthernet 0/0. When VRRP group 1 finds its priority (200) is higher than that of the current master device, it will declare its preemption of master after a delay of 15 seconds.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-if-
GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1 QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 preempt
delay 15
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 priority 200
```

Related Commands

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

<code>vrrp group ip ipaddress [secondary]</code>	Enables the VRRP function and set the IP address for the virtual device.
<code>vrrp group priority level</code>	Sets the VRRP group priority.

Platform Description

N/A

3.13. vrrp priority

Use this command to specify the priority of the VRRP group. Use the **no** form of this command to restore the default setting. `vrrp [ipv6] group`

`priority level`

`no vrrp [ipv6] group priority`

Parameter Description

Parameter	Description
<code>ipv6</code>	Specifies the priority of the IPv6 VRRP group.
<code>group</code>	VRRP group number
<code>level</code>	VRRP group priority

Defaults

This function is disabled by default. Once the VRRP function is enabled, the default priority of the VRRP group is 100.

Command Mode

Interface configuration mode

Usage Guide

This command is used to manually configure the VRRP router priority.

Configuration Examples

The following example sets the priority of IPv4 VRRP group 1 as 254.

```
QTECH#configure terminal QTECH(config)#interface  
GigabitEthernet 0/0
```


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```
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 priority 254
```

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 priority 254
```

The following example sets the priority of IPv6 VRRP group 1 as 254.

Related Commands

Command	Description
<code>vrrp group ip ipaddress [secondary]</code>	Enables the VRRP function and set the IP
	address for the virtual device.
<code>vrrp group preempt [delay seconds]</code>	Sets the VRRP in the preemption mode.

Platform Description

N/A

3.14. vrrp timers advertise

Use this command to specify the interval for the master device to send the VRRP advertisement. Use the **no** form of this command to restore the default setting.

```
vrrp [ ipv6 ] group timers advertise { advertise-interval | csec centisecond-interval }
no vrrp [ ipv6 ] group timers advertise
```

Parameter Description

Parameter	Description
<code>ipv6</code>	Applies to IPv6 VRRP.
<code>group</code>	VRRP group number

<i>advertise-interval</i>	Sets the interval time in seconds between sending VRRP advertisement.
csec <i>centisecond-interval</i>	Sets the interval time in milliseconds between sending advertisement frames from the master VRRP router in the backup group. The range is from 50 to 99. This value is not set by default. This parameter takes effect only for VRRPv3.

Defaults

This function is disabled by default. Once the VRRP function is enabled, the default advertisement interval of the master device is one second.

Command Mode

Interface configuration mode

Usage Guide

If the current device becomes the master device in the VRRP group, it will notify its VRRP status, priority and other information by sending the VRRP advertisement in the set interval.

Based on the RFC specification, the maximum advertisement interval of the IPv4/IPv6 VRRPv3 group is 40 seconds. The advertisement interval can be configured larger than 40 seconds, but the effective advertisement interval is 40 seconds.

Configuration Examples

The following example sets the IPv4 VRRP advertisement interval as 4 seconds.

```
QTECH#configure terminal
QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch.
QTECH(config-if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 timers advertise 4
```

The following example sets the IPv6 VRRP advertisement interval as 4 seconds.

```
QTECH#configure terminal
```

```
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch.
QTECH(config-if-GigabitEthernet 0/0)#ipv6 enable
```

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```
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1
```

```
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 timers advertise 4
```

The following example sets the IPv4 VRRP advertisement interval as 50 centi-seconds.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 timers advertise csec 50
```

The following example sets the IPv6 VRRP advertisement interval as 50 centi-seconds.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 timers advertise csec 50
```

Command	Description
<code>vrrp group ip <i>ipaddress</i> [<i>secondary</i>]</code>	Enables the VRRP function and set the IP address for the virtual device.
<code>vrrp group timers learn</code>	Enables the timer learning function.

Related Commands**Platform Description**

N/A

3.15. vrrp timers learn

Use this command to enable the timer learning function.

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

vrrp [*ipv6*] group timers learn

no vrrp [*ipv6*] group timers learn

Parameter Description

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

<code>ipv6</code>	Applies to IPv6 VRRP.
<code>group</code>	VRRP group number

Defaults

This function is disabled by default. Even if the VRRP function is enabled, the timer learning function

is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

Once the timer learning function is enabled, if the current device is a VRRP backup device, it will learn the VRRP advertisement interval from the VRRP advertisement of the master device, with which it calculates the master device's failure interval instead of the VRRP advertisement interval configured locally.

This command may synchronize the VRRP advertisement timer with the master device.

Configuration Examples

The following example enables the timer learning function on the IPv4 VRRP group 1.

```
QTECH#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 timers learn
vrrp ipv6 1 timers learn QTECH#configure
terminal
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-
if-GigabitEthernet 0/0)#ipv6 enable
QTECH(config-if-GigabitEthernet 0/0)#ipv6 address 2001::2/64 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 ipv6 FE80::1 QTECH(config-if-GigabitEthernet
0/0)#vrrp 1 ipv6 2001::1
QTECH(config-if-GigabitEthernet 0/0)#vrrp ipv6 1 timers learn
```

The following example to enables the timer learning function on the IPv6 VRRP group 1.

Related Commands

Command	Description
<code>vrrp group ip <i>ipaddress</i> [<i>secondary</i>]</code>	Enables the VRRP function and set the IP address for the virtual device.
<code>vrrp group ipv6 <i>ipaddress</i></code>	Enables the VRRP function and set the IPv6 address for the virtual device.
<code>vrrp group timers advertise <i>interval</i></code>	Sets the IPv4 VRRP advertising interval.
<code>vrrp ipv6 group timers advertise <i>interval</i></code>	Sets the IPv6 VRRP advertising interval.

Platform Description

N/A

3.16. vrrp track

Use these commands to enable the IPv4/IPv6 VRRP track in the interface configuration mode. Use the no form of these commands to restore the default setting.

Parameter Description

Parameter	Description
<i>group</i>	VRRP group number
<i>interface-type</i> <i>interface-number</i>	Type of monitored interface
bfd <i>interface-type</i> <i>interface-number</i> <i>ipv4-address</i>	Enables the specified neighbor IP address track via BFD.
<i>priority</i>	VRRP priority change range when the interface or ip address reachability status changes. If this parameter is not selected, the default value is 10.
ipv6	Applies to IPv6 VRRP.
<i>ipv4-address</i>	Monitored IPv4 address. With BFD configured, it refers to the neighbor IP address.
interval <i>interval-value</i>	The interval of time to probe whether the monitored ip address is reachable or not. If this parameter is not selected, the default value

	is 3 seconds.
timeout <i>timeout-value</i>	The timeout time of the unreachable monitored ip address. If this parameter is not selected, the default value is 1 seconds.
retry <i>retry-value</i>	Track retries. If the value is reached, the link is thought unreachable. If this parameter is not configured, the default value is 3.
<i>ipv6-global-address</i>	Global unicast IPv6 address
<i>ipv6-linklocal-address</i>	Local link IPv6 address

vrrp group track { *interface-type interface-number* | **bfd** *interface-type interface-number ipv4-address* } [*priority*]

vrrp ipv6 group track *interface-type interface-number* [*priority*]

no vrrp [**ipv6**] **group track** *interface-type interface-number*

Use these commands to enable VRRP IPv4/IPv6 address track. Use the **no** form of these commands to restore the default setting.

vrrp group track *ipv4-address* [**interval** *interval-value*] [**timeout** *timeout-value*] [**retry** *retry-value*] [*priority*]

vrrp ipv6 group track { *ipv6-global-address* | *ipv6-linklocal-address interface-type interface-number* } [**interval** *interval-value*] [**timeout** *timeout-value*] [**retry** *retry-value*] [*priority*]

no vrrp group track *ipv4-address*

no vrrp ipv6 group track { *ipv6-global-address* | *ipv6-linklocal-address interface-type interface-number* }

Use this command to disable the specified neighbor IP address track via BFD.

no vrrp group track bfd *interface-type interface-number ipv4-address*

Defaults

This function is disabled by default. Even if the VRRP function is enabled, no interface or IP address is specified.

Command Mode

Interface configuration mode

Usage Guide

- ❖ This command can be used to monitor the outlet links. Note that layer-3 routable logical interfaces can be monitored (such as Routed Port, SVI, Loopback and Tunnel).
- ❖ If a host is monitored, specify the IPv4 address for the IPv4 VRRP router or the IPv6 address for the IPv6 VRRP router.
- ❖ If the host IP address is link-local, an interface must be specified.
- ❖ If a VRRP router owns the IP address of the physical interface, the priority is 255. Keep the priority when the monitored IP address or interface is set.

Configuration Examples

The following example enables the VRRP group 1 to monitor the routed port Fa1/1. If the Fa1/1 link is disconnected, the priority of the VRRP group decreases by 30. When the Fa1/1 link recovers, the priority of VRRP group 1 is restored.

```
ijie#configure terminal QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch. QTECH(config-if-
GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 priority 254
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 track GigabitEthernet 1/1 30
```

The following example sets the VRRP to track the specified neighbor IP address 192.168.1.3 through BFD:

```
QTECH#configure terminal
Enter configuration commands, one per line. End with CNTL/Z. QTECH(config)#interface
FastEthernet 0/1
QTECH(config-if)#no switchport //used on the switch. QTECH(config-
if)#ip address 192.168.1.1 255.255.255.0
QTECH(config-if)#bfd interval 50 min_rx 50 multiplier
```

Related Commands

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

<code>vrrp group ip ipaddress [secondary]</code>	Enables the VRRP function and set the IP
	address for the virtual device.
<code>vrrp group priority level</code>	Sets the VRRP group priority.

Platform Description

N/A

3.17. vrrp version

Use this command to configure the version of sending the IPv4 VRRP multicast packets. For the IPv4 VRRP, there are two versions: VRRPv2 and VRRPv3.

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

`vrrp group version { 2 | 3 }`

`no vrrp group version`

Parameter Description

Parameter	Description
2	Uses the VRRPv2 version to send the packets.
3	Uses the VRRPv3 version to send the packets.

Defaults

The default is VRRPv2.

Command Mode

Interface configuration mode

Usage Guide

Considering the compatibility of VRRPv2 and VRRPv3 for the IPv4 VRRP, you can choose the version of VRRP packets based on the actual network environment. VRRPv2 is based on RFC3768 and VRRPv3 is based on RFC 5798.

This command is applicable to IPv4 VRRP only

Configuration Examples

The following example configures the version of sending the IPv4 VRRP packets on the interface gi0/0.

```
QTECH#configure terminal
QTECH(config)#interface
GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#no switchport //used on the switch.
QTECH(config-if-GigabitEthernet 0/0)#ip address 10.0.1.1 255.255.255.0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 10.0.1.20
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 version 3
```

Related Commands

Command	Description
<code>vrrp group ip <i>ipaddress</i> [<i>secondary</i>]</code>	Enables the VRRP function and set the IP address for the virtual device.
<code>vrrp group timers advertise <i>interval</i></code>	Sets the interval of sending the VRRP advertisement.

Platform Description

N/A

3.18. vrrp detection-vlan

Use this command to enable IPv4 VRRP packets to be sent to only the first or a specified Sub VLAN in a Super VLAN interface.

Use the **no** form of this command to enable IPv4 VRRP packets to be sent to all the Sub VLANs in a Super VLAN interface.

vrrp detection-vlan {*first-subvlan* | *subvlan-id*}

no vrrp detection-vlan

Parameter Description

Parameter	Description
<i>first-subvlan</i>	IPv4 VRRP packets are sent to only the first Sub VLAN in a Super VLAN interface.
<i>subvlan-id</i>	IPv4 VRRP packets are sent to a specified Sub VLAN in a Super VLAN interface.

Defaults

By default, IPv4 VRRP packets are sent to only the first Sub VLAN in a Super VLAN interface.

Command Mode

Interface configuration mode

Usage Guide Use this command to configure the mode in which IPv4 VRRP packets are sent to a Super VLAN interface. There are three modes in which IPv4

- ❖ This command is configured on a VLAN interface and applies only to Super VLAN interfaces.

VRRP packets are sent to a Super VLAN interface: to only the first Sub VLAN, to a specified Sub VLAN, or all Sub VLANs.

Configuration Examples

The following example enables IPv4 VRRP packets to be sent to all Sub VLANs in Super VLAN 3.

```
QTECH#configure terminal QTECH(config)# vlan 3
QTECH(config-vlan)# supervlan QTECH(config-
vlan)# subvlan 5-10 QTECH(config-vlan)#exit
QTECH(config)#interface vlan 3
QTECH(config-if)# no vrrp detection-vlan
```

Related Commands

Command	Description
vrrp ip	Enables the VRRP function and set the IP address of the VRRP.

Platform Description

N/A

4.1. show vrrp balance

Use this command to display the VRRP Plus brief or details.

show vrrp balance [**brief** | *group*]

Parameter Description

Parameter	Description
brief	(Optional) Displays the VRRP Plus brief.
<i>group</i>	(Optional) Displays the VRRP Plus details.

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

If no optional parameter is used, the details of all VRRP Plus group are displayed.

Configuration Examples

The following example displays the details of all VRRP Plus groups.

```
QTECH#show vrrp balance VLAN 1 - Group
1
  State is BVG
  Virtual IP address is 192.168.1.54 Hello time 1
  sec, hold time 3 sec Load balancing: host-
  dependent
  Redirect time 300 sec, forwarder time-out 14400 sec Weighting 90
  (configured 100), thresholds: lower 1, upper 100
  Track object 1, state: down, decrement weight: 10 There are 2
  forwarders
  Forwarder 1 (local) MAC address:
    0000.5e00.0101
  Owner ID is 00d0.f822.33ab Forwarder 2
  MAC address:
    001a.a916.0201
  Owner ID is 00d0.f822.8800 QTECH#show ipv6
```

```

vrrp balance VLAN 2 - Group 1

State is BVG

Virtual IPv6 address is as follows: FE80::8
  2000::8

Hello time 2 sec, hold time 6 sec Load
balancing: weighted

Redirect time 300 sec, forwarder time-out 14400 sec

Weighting 100 (configured 100), thresholds: lower 1, upper 100 There are 2
forwarders

Forwarder 1 (local) MAC address:
  0000.5e00.0201

Owner ID is 00d0.f822.33f5

Preemption disabled (BVG cannot be preempted) Forwarder 2
MAC address:
  1414.4b72.7701

Owner ID is 00d0.f822.33b9

Preemption enabled

```

```

QTECH# show vrrp balance brief
Interface Grp   State   Group Addr   MAC addr
VLAN 1      1       BVG    192.168.1.1  0000.5e00.0101

```

The following example shows the brief of the VRRP Plus group.

Related Commands

Command	Description
<code>vrrp group balance</code>	Enables the VRRP Plus function.
<code>vrrp group load-balancing { host-dependent round-robin weighted }</code>	Sets the load balancing policy of the VRRP Plus.
<code>show vrrp balance interface type number [brief]</code>	Displays the VRRP Plus running status of the specified interface.

Platform Description

N/A

4.2. show vrrp balance interface

Use this command to display the actions of the VRRP Plus group on the specified interface.

show vrrp balance interface type number [brief]

Parameter Description

Parameter	Description
<code>interface type number</code>	Specifies the interface type and number.
<code>brief</code>	(Optional) Displays the brief information.

Defaults

N/A

Command Mode

Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide

N/A

Configuration Examples

The following example displays the actions of the VRRP Plus on FastEthernet 0/0.

```
QTECH# show vrrp balance interface FastEthernet 0/0 FastEthernet
0/0 - Group 1
  State is BVG
  Virtual IP address is 192.168.1.54 Hello time 1
  sec, hold time 3 sec Load balancing: host-
  dependent
  Redirect time 300 sec, forwarder time-out 14400 sec Weighting 90
  (configured 100), thresholds: lower 1, upper 100
  Track object 1, state: down, decrement weight: 10 There are 2
  forwarders
  Forwarder 1 (local) MAC address:
    0000.5e00.0101
  Owner ID is 00d0.f822.33ab Forwarder 2
  MAC address:
    001a.a916.0201
  Owner ID is 00d0.f822.8800
```

Related Commands

Command	Description
<code>vrrp group balance</code>	Enables the VRRP Plus function.



<code>vrrp group load-balancing { host-dependent round-robin weighted }</code>	Sets the load balancing policy of the VRRP Plus.
<code>show vrrp balance interface type number [brief]</code>	Displays the VRRP Plus running status of the specified interface.

Platform Description

N/A

4.3. vrrp balance

Use this command to enable the VRRP Plus function. Use the **no** form of this command to disable this function. **vrrp group balance**

no vrrp group balance

Parameter Description

Parameter	Description
<i>group</i>	Enables the VRRP Plus function on the VRRP of specified group ID.

Defaults

VRRP Plus is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

To enable VRRP Plus, you must configure the VRRP group first.

Configuration Examples

The following example enables the VRRP Plus function on the Layer 3 interface GigabitEthernet0/0.

```
QTECH#config
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 192.168.1.1 QTECH(config-
if-GigabitEthernet 0/0)#vrrp 1 balance
```

Related Commands

Command	Description
<code>vrrp load-balancing</code>	Sets the load balancing policy of the VRRP Plus.
<code>show vrrp balance</code>	Displays the VRRP Plus running status.
<code>show vrrp balance interface</code>	Displays the VRRP Plus running status of the specified interface.

Platform Description

N/A

4.4. vrrp forwarder preempt

Use this command to enable the forwarding preemption on the VRRP Plus backup group. Use the **no** form of this command to disable this function.

`vrrp group forwarder`

`preempt no vrrp group`

`forwarder preempt`

Parameter Description

Parameter	Description
<code>group</code>	VRRP group number. The range is from 1 to 255.

Defaults

By default, forwarding preemption is enabled.

Usage Guide

N/A

Configuration Examples

The following example enables the forwarding preemption function of the VRRP Plus backup group on the Layer3 interface GigabitEthernet 0/0.

```
QTECH#config
```

```
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)#vrrp 1 ip 192.168.1.1 QTECH(config-if-
GigabitEthernet 0/0)#vrrp 1 balance QTECH(config-if-GigabitEthernet 0/0)#vrrp
1 forwarder preempt
```

Related Commands

Command	Description
<code>vrrp group balance</code>	Enables the VRRP Plus function.
<code>show vrrp balance [brief group]</code>	Displays the VRRP Plus running status.
<code>show vrrp balance interface type number [brief]</code>	Displays the VRRP Plus running status of the specified interface.

Platform Description

N/A

4.5. vrrp load-balancing

Use this command to set the VRRP Plus load balancing policy. Use the **no** form of this command to restore the default setting.

Vrrp group load-balancing { host-dependent | round-robin | weighted }
no vrrp group load-balancing { host-dependent | round-robin | weighted }

Parameter Description

Parameter	Description
<code>group</code>	Specifies the VRRP group ID.
<code>host-dependent</code>	Sets the host-dependent load balancing policy, so as to use the different virtual MACs to reply the host's ARP request based on different hosts.
<code>round-robin</code>	Sets the round-robin balancing policy, so as to use the different virtual MACs to reply the host's ARP request in turn, which is the default setting.
<code>weighted</code>	Sets the weight balancing policy, so as to perform the ARP reply based on the device weight of the backup group.

Defaults

The default is round-robin.

Usage Guide

N/A

Configuration Examples

The following example sets the load balancing policy of the VRRP Plus group1 on Layer 3 interface GigabitEthernet0/0 as host-dependent.

```
QTECH# config t
QTECH(config)# interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 ip 192.168.1.1 QTECH(config-
if-GigabitEthernet 0/0)# vrrp 1 balance
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 load-balancing host-dependent
```

Related Commands

Command	Description
<code>vrrp group balance</code>	Enables the VRRP Plus function.
<code>show vrrp balance [brief group]</code>	Displays the VRRP Plus running status.
<code>show vrrp balance interface type number [brief]</code>	Displays the VRRP Plus running status o the specified interface.

Platform Description

N/A

4.6. vrrp timers redirect

Use this command to set the redirection interval and timeout of the proxy virtual MAC address for the VRRP Plus backup group.

Use the **no** form of this command to restore the default value.

vrrp group timers redirect *redirect timeout*

no vrrp group timers redirect

Parameter Description

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

<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.
<i>redirect</i>	The redirection time, 300 seconds (namely 5 minutes) by default, in the range of 0 to 3,600.
<i>timeout</i>	The timeout, 14,400 seconds (namely 4 hours) by default, in the range of (redirect+600) to 64,800.

Defaults

The default redirection interval is 300 seconds and redirection timeout is 14,400 seconds.

Command Mode

Interface configuration mode

proxy virtual MAC address for the VRRP Plus backup group.

Configuration Examples

The following example sets the redirection interval and timeout of the proxy virtual MAC address for the VRRP Plus backup group.

```
QTECH#config
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 ip 192.168.1.1
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 balance
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 timers redirect 300 6000
```

Related Commands

Command	Description
vrrp group balance	Enables the VRRP Plus function.
show vrrp balance [brief group]	Displays the VRRP Plus running status.
show vrrp balance interface type number [brief]	Displays the VRRP Plus running status o the specified interface.

Platform Description

N/A

4.7. vrrp weighting

Use this command to set the weight and threshold of the VRPP Plus backup group. Use the **no** form of this command to restore the default setting.

4. VRRP Plus Commands

```
vrrp group weighting maximum [ lower lower ] [ upper upper ]
```

```
no vrrp group weighting
```

Parameter Description

Parameter	Description
<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.
<i>maximum</i>	Weight, 100 by default, in the range of 2 to 254.
<i>lower</i>	Weight lower, 1 by default, in the range of 1 to (maximum-1)
<i>upper</i>	Weight upper, 100 by default, in the range of lower to maximum.

Defaults

VRRP Plus backup group weight: 100

Weight lower: 1

Weight upper: 100

Command Mode

Interface configuration mode

Usage Guide

The VRRP Plus function should be enabled before setting the weight and threshold of the VRRP Plus backup group

Configuration Examples

The following example sets the weight and threshold of the VRRP Plus group1.

```
QTECH#config t
QTECH(config)#interface GigabitEthernet 0/0
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 ip 192.168.1.1
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 balance
QTECH(config-if-GigabitEthernet 0/0)# vrrp 1 weighting 50 lower 30 upper 50
```

Related Commands

Command	Description
<code>vrrp group balance</code>	Enables the VRRP Plus function.

<code>show vrrp balance [brief group]</code>	Displays the VRRP Plus running status.
<code>show vrrp balance interface <i>type number</i> [brief]</code>	Displays the VRRP Plus running status of the specified interface.

Platform Description

N/A

5.1. bfd

Use this command to set the BFD session parameters. Use the **no** form of this command to remove the setting.

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no bfd interval

Parameter Description

Parameter	Description
interval <i>milliseconds</i>	Interval of sending the BFD control messages to the BFD session neighbor. <i>milliseconds</i> : The range is from 50 to 10,000 ms.
min_rx <i>milliseconds</i>	Expected interval of receiving the BFD control messages from the BFD session neighbor. <i>milliseconds</i> : The range is from 50 to 10,000 ms.
multiplier <i>multiplier-value</i>	Count of BFD control message not received from the peer in the configured interval. <i>multiplier-value</i> : The range is from 3 to 50.

Defaults

No BFD session parameter is configured by default.

Command Mode

Interface configuration mode for single-hop sessions, BFD template mode for multi-hop sessions

Usage Guide

The express forwarding must be enabled before enabling BFD on the routers. BFD session parameters should be consistent on peers, so that associated protocols will take effect at the same time. If not, one-way forwarding will occur. Set the parameters based on interface bandwidth. If **interval** and **min_rx** are too short, BFD sessions may occupy much bandwidth and influence data transmission.



If multi-hop session parameters need to be configured using a template, configure the template first and then configure BFD multi-hop session parameters.

Configuration Examples

The following example configures the BFD session parameters on routed port FastEthernet 0/2.

```
QTECH(config)# interface fastEthernet 0/2 QTECH(config)#
no switchport
QTECH(config-if)# bfd interval 100 min_rx 100 multiplier 3
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

5.2. bfd bind peer-ip

Use this command to create a BFD session to correlate with an interface. Use the **no** form of this command to remove this setting.

bfd bind peer-ip *ip-address* [**source-ip** *ip-address*]

process-pst no bfd bind peer-ip *ip-address*

Parameter Description

Parameter	Description
peer-ip <i>ip-address</i>	The peer IP address to be detected, which must be directly connected to the Layer 3 interface.
source-ip <i>ip-address</i>	Source IP address for sending the BFD packets, which avoids the packets dropped by the URPF in case that this function is used with other functions such the URPF at the same time.
process-pst	Correlates BFD for the Layer3 interface.

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

Note that this command must be configured a Layer 3 interface and the peer IP address detected must be the address directly-connected to the interface.

Configuration Examples

The following example detects the peer 1.1.1.2 through BFD on the routed port to generate the BFD status of the interface.

```
QTECH(config)# interface gigabitEthernet 0/2 QTECH(config-if
-GigabitEthernet 0/2)#no sw
QTECH(config-if -GigabitEthernet 0/2)#ip address 1.1.1.1 255.255.255.0 QTECH(config-if -
GigabitEthernet 0/2)#bfd bind peer-ip 1.1.1.2 source-ip
1.1.1.1 process-pst
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

5.3. bfd cpp

Use this command to enable the BFD protection policy. Use the **no** form of this command to disable this function. **bfd cpp**
no bfd cpp

Parameter Description

Parameter	Description
N/A	N/A

Defaults

This function is enabled by default.

Command Mode

Global configuration mode

Usage Guide

BFD protocol is so sensitive that if the device with BFD function enabled suffers from attack (for example, a large amount of Ping packets attack the device), which lead to the BFD session turbulence, the device can be protected by enabling the BFD protection policy. However, if the BFD function and the BFD protection policy are enabled at the same time, the loss of BFD packets on the attacked device occurs when the packets sent from the last-hop device go through this device, influencing the BFD session establishment between the last-hop device and other devices. This function is valid only for the switches.

Configuration Examples

Related Commands

Platform Description

The following example enables the BFD protection policy.

```
QTECH(config)# bfd cpp
```

Command	Description
N/A	N/A

N/A

5.4. bfd echo

Use this command to enable echo mode.

Use the **no** form of this command to disable echo mode.

```
bfd echo no
```

```
bfd echo
```

Parameter Description

Parameter	Description
N/A	N/A

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

By default, with BFD session parameter configured, the system enables the echo mode automatically.

The minimum sending and receiving interval for the echo packets are the values of the configured

interval *milliseconds* and **min_rx** *milliseconds*.

This command cannot be configured on the AP port.

Before enabling BFD echo mode, it is necessary to use the **no ip redirects** command to disable the ICMP redirection messages sending on the neighbor device of the BFD session, use the **no ip deny land** to disable the DDOS (Land-based attack prevention) function.

With both ends of the BFD session enabled, the echo mode takes effect.

In the process that the forwarding plane of the peer device returns echo packets transmitted by the local end to the local end, the echo packets may be lost due to congestion of the peer device, causing a session detection failure. In this case, configure Quality of Service (QoS) policies to ensure that echo packets are processed preferentially or disable the echo function.

The echo detection function of BFD does not support multi-hop detection.

Ensure that the echo function is disabled when configuring multi-hops.

Configuration Examples

The following example enables the echo mode on the routed port FastEthernet 0/2:

```
QTECH(config)# interface fastEthernet 0/2 QTECH(config)#
no switchport
QTECH(config-if)# bfd echo
```

Related Commands

Command	Description
bfd	Configures the BFD session parameter.
bfd slow-timer	Configures the slow-timer time.

Platform Description

N/A

5.5. bfd slow-timer

Use this command to set the slow timer, which is used to send the BFD packets in the BFD asynchronous mode.

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

bfd slow-timer [*milliseconds*]

no bfd slow-timer

Parameter

Parameter	Description
milliseconds	BFD slow-timer time. The range is from 1,000 to 30,000. The unit is millisecond.

Description

Defaults

The default slow-timer is 2,000 milliseconds.

Command Mode

Global configuration mode

Usage Guide

N/A

Configuration Examples

Related Commands

Platform Description

The following example sets the slow-timer to 14,000 milliseconds.

```
QTECH(config)# bfd slow-timer 14000
```

Command	Description
bfd echo	Enables the BFD echo function

N/A

5.6. bfd up-dampening

Use this command to set the BFD up-dampening time.

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

bfd up-dampening [*milliseconds*]

no bfd up-dampening

Parameter Description

Parameter	Description
<i>milliseconds</i>	(Optional) Sets the BFD up-dampening time. The range is from 0 to 300,000. The unit is millisecond.

Defaults

The default is 0 millisecond, which means that the notification is sent to the related application once the session state is UP.

Command Mode

Interface configuration mode for single-hop sessions, BFD template mode for multi-hop sessions

Usage Guide

This function needs to be enabled only when the link is instable.

If a BFD session does not frequently switch over between Down and Up, the enabling of BFD flapping dampening will delay notifying an associated application of BFD Up.

If multi-hop session parameters need to be configured using a template, configure the template first and then configure BFD multi-hop session parameters.

Configuration Examples

Related Commands

Platform Description

The following example sets the BFD up-dampening time to 60,000 milliseconds.

```
QTECH(config)# bfd up-dampening 60000
```

Command	Description
bfd	Configures the BFD session parameter.

N/A

5.7. show bfd neighbors

Use this command to display the BFD session parameters.

```
show bfd neighbors [ vrf vrf-name ] [ client { ap | bgp | isis | ospf | ospfv3 | rip | vrrp |  
static-route  
| pbr | vrrp-balance | pst } ] [ ipv4 ip-address | ipv6 ip-address ] [ details ]
```

Parameter Description

Parameter	Description
vrf <i>vrf-name</i>	(Optional) sets the neighbor VRF name.
client	(Optional) specifies the routing protocol.
ap	Displays the BFD session configuration for Layer 3 aggregate ports.
bgp	Displays the BFD session configuration for BGP.
isis	Displays the BFD session configuration for ISIS.
ospf	Displays the BFD session configuration for OSPF.
ospfv3	Displays the BFD session configuration for OSPFv3.
rip	Displays the BFD session configuration for RIP.
vrrp	Displays the BFD session configuration for VRRP.
static-route	Displays the BFD session configuration for the static route.
pbr	Displays the BFD session configuration for PBR.
vrrp-balance	Displays the BFD session configuration for the VRPP.
pst	Displays the BFD session configuration and the Layer3 interface status.
ipv4 <i>ip-address</i>	(Optional) Displays the session information of the specified IPv4 neighbor.
ipv6 <i>ip-address</i>	(Optional) Displays the session information of the specified IPv6 neighbor.
details	(Optional) Displays the configurations in detail.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

In the information displayed by the **show bfd neighbors** command, the OurAddr field means the source address of the session. The “-“ is displayed if

the source address is not specified, and it occurs in the BFD session for the LSP backward IP correlation.

Configuration Examples

The following example displays the BFD session configuration.

```
IPV4 sessions: 1, UP: 1
IPV6 sessions: 0, UP: 0
OurAddr      NeighAddr      LD/RD      RH Holddown(mult) State Int
192.168.24.2 192.168.24.1 8192/8192 Up    0(3)      Up GigabitEthernet 0/1
```

```
QTECH#sh bfd neighbors IPV4 sessions: 1, UP: 1
IPV6 sessions: 0, UP: 0
OurAddr      NeighAddr      LD/RD      RH/RS      Holddown(mult) State Int
192.168.24.2 192.168.24.1 8192/8192 Up    0(3 )      Up
GigabitEthernet 0/1

Session state is Up and using echo function with 50 ms interval. Local Diag: 0,
Demand mode: 0, Poll bit: 0
MinTxInt: 3000000, MinRxInt: 3000000, Multiplier: 3
Received MinRxInt 3000000, Multiplier: 3
Holddown (hits): 9000(0), Hello (hits): 3000(36)
Rx Count: 127, Rx Interval (ms) min/max/avg: 40/999/999
Tx Count: 135, Tx Interval (ms) min/max/avg: 1000/1000/999 Registered protocols:
VRRP
Uptime: 0:01:19
Last packet:
- Version      : 1      Diagnostic : 0
- State bit    : Up     Demand bit  : 0
- Poll bit     : 0      Final bit   : 0
- Multiplier   : 3      Length      : 24
- My Discr     8192     Your Discr  : 8192
Min tx interval : 3000000 - Min rx interval: 3000000
Min Echo interval: 50000
```

The following example displays the BFD session configuration in detail.

The following example displays the BFD session configuration for Layer 3 aggregate ports.

```
QTECH#show bfd neighbors client ap
IPV4 sessions: 1, UP: 0
IPV6 sessions: 0, UP: 0
OurAddr NeighAddr      LD/RD      RH/RS      Holddown(mult) State Int
192.168.23.1 192.168.23.2 8192/0     Admin      0(3 )      Down
GigabitEthernet 0/2 (AP 1)
```

Related Commands

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



N/A	N/A

Platform Description

N/A

6.1. dampening

Use this command to enable the IP event dampening function on the interface. Use the **no** or **default**

form of this command to disable this function.

```
dampening [ half-life-period [ reuse-threshold suppress-threshold max-suppress [ restart [ restart-penalty ] ] ] ]
```

```
] no dampening
```

```
default dampening
```

Parameter Description

Parameter	Description
<i>half-life-period</i>	Configures the half-life period of suppression penalty. The range is from 1 to 30. The unit is seconds. The default value is 5 seconds.
<i>reuse-threshold</i>	Configures the penalty threshold to unsuppress the interface. The range is from 1 to 20,000. The default value is 1,000.
<i>suppress-threshold</i>	Configures the penalty threshold to suppress the interface. The range is from 1 to 20,000. The default value is 2,000.
<i>max-suppress</i>	Configures the maximum suppress time. The range is from 1 to 255. The default value is 4 times of the <i>half-life-period</i> .
restart-penalty	Configures the initial penalty value on the interface. The range is from 1 to 20,000. The default value is 2,000.

Defaults

IP event dampening is disabled by default.

Command mode

Interface configuration mode.

Usage Guide

This function will influence the modules of the directly-connected/host route, static route, dynamic route and VRRP. If one interface meets the configuration condition of this command, which is in the suppression status, the above



6. IP Event Dampening Commands

influenced modules consider the status of this interface as DOWN, so as to delete the corresponding route and not transceive the data packets on this interface.

Re-configuring the dampening command on the interface that has been configured this command makes all dampening information on this interface cleared. However, the interface flapping times will be remained unless use the clear counters command to clear the statistical information of the interface.

Configuration Examples

The following example configures the IP event dampening function.

```
QTECH(config)#interface gigabitEthernet 0/1 QTECH(config-if-
GigabitEthernet 0/1)# no switchport
QTECH(config-if-GigabitEthernet 0/1)# dampening 30 1500 10000 100
```

Related Commands

Command	Description
clear counters	Clears the interface counters.
show dampening interface	Displays the statistics of the dampening interface.
show interface dampening	Displays details of the dampening interface.

Platform Description

When a Layer-3 port on a switch is converted to a Layer-2 port (for example, from a routed port to a switch port), the IP Event Dampening configuration on the port will be deleted.

6.2. show dampening interface

Use this command to show the statistics of the dampening interface.

show dampening interface**Parameter Description**

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

N/A	N/A
-----	-----

Defaults

N/A

Command mode

Privileged EXEC mode/ global configuration mode/ interface configuration mode

Usage Guide

N/A

Configuration Examples

The following example displays the statistics of the dampening interface.

```
QTECH# show dampening interface
3 interfaces are configured with dampening.
No interface is being suppressed.
```

Related Commands

Command	Description
dampening	Enables the IP event dampening function on the interface.
clear counters	Clears the interface counters.
show interface dampening	Displays details of IP event dampening configuration.

Platform Description

N/A

6.3. show interface dampening

Use this command to display the details of IP event dampening configuration.

show interface [*interface-id*] **dampening**

Parameter Description

Parameter	Description
<i>interface-id</i>	Interface name



Defaults

N/A

Command mode

Privileged EXEC mode/ global configuration mode/ interface configuration mode

Usage Guide

If the interface-id is specified, only the dampening information of this specified interface is displayed.

Configuration Examples

The following example shows the details of IP event dampening configuration.

```
QTECH# show interface dampening Ethernet1/0
Flaps Penalty Supp ReuseTm HalfL ReuseV SuppV MaxSTm MaxP Restart 0 0
FALSE 0 5 1000 2000 20 16000 0
```

Domain	Description
Flaps	Interface flapping times.
Penalty	The current penalty value on the interface.
Supp	Suppressed or not.
ReuseTm	Time to unsuppress the interface, in seconds.
HalfL	Half-life period, in seconds.
ReuseV	Unsuppressed threshold.
SuppV	Start suppression threshold.
MaxSTm	Maximum suppression time.
MaxP	Maximum penalty value.
Restart	The initial penalty value on the interface.

Related Commands

Command	Description
dampening	Enables the IP event dampening function.
clear counters	Clears the interface counters.
show dampening interface	Displays statistics of the dampening interface.

Platform Description

N/A

7.1. dad relay enable

Use this command to enable the Dual-Active Detection (DAD) relay function. Use the **no** form of this command to restore the default setting.

dad relay enable

no dad relay enable

Parameter Description

Parameter	Description
N/A	N/A

Defaults

This function is disabled by default.

Command Mode

Interface configuration mode

Usage Guide

This command is only supported on the aggregate port (AP).

Configuration Examples

The following example enables the AP-based DAD relay function.

```
QTECH(config)#interface aggregateport 1
QTECH(config-if-AggregatePort 1)#dad relay enable
```

```
QTECH(config)#interface aggregateport 1 QTECH(config-if-
AggregatePort 1)#no dad relay enable
QTECH(config-if-AggregatePort 1)#exit
```

The following example disables the AP-based DAD relay function.

Related Commands

Command	Description
dual-active detection	Configures DAD.
dual-active pair interface	Configures a pair of Bidirectional Forwarding Detection (BFD)-based DAD interfaces.
dual-active exclude interface	Configures an exclude interface of DAD.

<code>show switch virtual dual-active</code>	Displays the configuration and status of DAD.
--	---

Platform Description

N/A

7.2. dual-active bfd interface

Use this command to configure a BFD port.

Use the **no** form of this command to remove the setting.

dual-active bfd interface *interface-name*

no dual-active bfd interface *interface-name*

Parameter Description

Parameter	Description
<i>interface-name</i>	Interface name

Defaults

N/A

Command Mode

config-vs-domain configuration mode

Usage Guide

The BFD port must be a routing port on the peer end.

Configuration Examples

The following examples configures interface Gi 1/1/1 as a BFD port.

```
QTECH(config)# interface GigabitEthernet 1/1/1 QTECH(config-if-
GigabitEthernet 1/1/1)# no switchport QTECH(config)# interface
GigabitEthernet 2/1/1 QTECH(config-if- GigabitEthernet 2/1/1)# no
switchport QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# dual-active bfd interface GigabitEthernet 1/1/1
QTECH(config-vs-domain)# dual-active bfd interface GigabitEthernet 2/1/1
```

Related Commands

Command	Description
N/A	N/A

Platform Description

7.3. dual-active detection

Use this command to enable DAD.

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

dual-active detection { bfd | aggregateport }

no dual-active detection { bfd | aggregateport }

Parameter Description

Parameter	Description
bfd	BFD-based DAD
aggregateport	AP-based DAD

Defaults

This function is disabled by default.

Command Mode

config-vs-domain configuration mode

Usage Guide

Configure this command only in virtual switch unit (VSU) mode.

Configuration Examples

```
QTECH(config)# switch virtual domain 1
```

```
QTECH(config-vs-domain)# dual-active detection bfd
```

The following example disables BFD-based DAD

```
QTECH(config)# switch virtual domain 1
```

```
QTECH(config-vs-domain)# dual-active detection aggregateport
```

The following example enables AP-based DAD.

```
QTECH(config)# switch virtual domain 1
```

```
QTECH(config-vs-domain)# dual-active detection aggregateport
```

Related Commands

Command	Description
dual-active pair interface	Configures a DAD interface.
dual-active exclude interface	Configures an exclude interface of DAD.
show switch virtual dual-active	Displays the configuration and status of DAD.

Platform Description

N/A

7.4. dual-active exclude interface

Use this command to configure an exclude interface of DAD.

Use the **no** form of this command to remove the exclude interface setting.

dual-active exclude interface *interface-name*

no dual-active exclude interface *interface-name*

Parameter Description

Parameter	Description
<i>interface-name</i>	Interface name

Defaults

N/A

Command Mode config-vs-domain configuration mode

Usage Guide

Configure this command only in VSU mode.

An exclude interface must be a routing interface instead of a virtual switch link (VSL) interface. Multiple exclude interfaces are supported.

Configuration Examples

The following example configures interface Gi 1/1/3 as an exclude interface of DAD.

```
QTECH(config)# interface GigabitEthernet 1/0/3
```

```
QTECH(config-if- GigabitEthernet 1/0/3)# no switchport QTECH(config)#  
switch virtual domain 1
```

```
QTECH(config-vs-domain)# dual-active exclude interface GigabitEthernet  
1/0/3
```

Related Commands

Command	Description
dual-active detection	Configures DAD.
dual-active pair interface	Configures a DAD interface.
show switch virtual dual-active	Displays the configuration and status of DAD.

Platform Description

N/A

7.5. dual-active interface

Use this command to configure an AP-based DAD interface. Use the **no** form of this command to remove the setting. **dual-active interface** *interface-name*

no dual-active interface

Parameter Description

Parameter	Description
<i>interface-name</i>	Interface type and interface number. An AP-based DAD interface must be specified.

Defaults

N/A

Command Mode

config-vs-domain configuration mode

Usage Guide

Only one AP-based detection interface can be configured. Create an AP-based interface before setting it to a detection interface. The previous detection interface will be overwritten by the current detection interface.

Configuration Examples

The following example configures AP 1 as the AP-based detection interface.

```
QTECH(config)# interface aggregateport 1 QTECH(config-if-  
AggregatePort 1)#exit QTECH(config)# switch virtual domain  
1  
QTECH(config-vs-domain)# dual-active interface aggregateport 1
```

Related Commands

Command	Description
dual-active detection	Configures BFD-/AP-based DAD.
show switch virtual dual-active	Displays the configuration and status of DAD.

Platform

N/A

Description

7.6. port-member interface

Use this command to add a VSL-AP member interface.

Use the **no** form of this command to delete a VSL-AP member interface.

port-member interface *interface-name*

no port-member interface *interface-name*

Parameter Description

Parameter	Description
<i>interface-name</i>	Interface name, for example, GigabitEthernet 0/1 and GigabitEthernet 0/3.

Defaults

N/A

Command Mode

config-vsl-port configuration mode

Usage Guide

Configure this command in VSU mode or in standalone mode.

Configuration Examples

The following example adds and deletes a VSL-AP member port in standalone mode.

```
QTECH(config)# vsl-port
QTECH(config-vsl-port)# port-member interface GigabitEthernet 0/1
QTECH(config-vsl-port)# no port-member interface GigabitEthernet 0/2
```

```
QTECH(config)# vsl-port
QTECH(config-vsl-port)# port-member interface GigabitEthernet 1/0/1
QTECH(config-vsl-port)# no port-member interface GigabitEthernet 1/0/1
```

The following example adds and deletes a VSL-AP member port in VSU mode.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

7.7. led-blink

Use this command to configure LED blink function.

led-blink {enable | disable} [device *device_id*]

Parameter Description

Parameter	Description
<i>enable</i>	Enables this function.
<i>disable</i>	Disables this function.
<i>device_id</i>	Device ID

Defaults

This function is disabled by default.

Command Mode

Privileged EXEC mode

Usage Guide

In single-device mode, this function can be only enabled and disabled.

In VSU mode, a device can be specified. If not specified, all devices in the VSU will be configured. If running for 30 minutes, this function is disabled automatically even without any operation.

The configuration cannot be saved. In case of restart or active/standby switch-over, it will be removed.

Configuration Examples

The following example enables and disables LED blink function.

```
QTECH#led-blink enable
QTECH#led-blink disable
```

The following example enables and disables LED blink function on Device 2.

```
QTECH#led-blink enable device 2
QTECH#led-blink disable device 2
```

The following example enables and disables LED blink function in VSU.

```
QTECH#led-blink enable
```

```
QTECH#led-blink disable
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

7.8. session

Parameter Description

Use this command to perform redirection to a host or a device console.

session { **device** *switch_id* | **master** }

Parameter	Description
device	Redirects to the member device console.
<i>switch_id</i>	Member device number, varying with products
master	Redirects to the host console.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

This command takes effect in VSU mode.

Configuration Examples

The following example redirects the serial port console of standby device 2 to the master device console.

```
QTECH-STANDBY#session master QTECH#exit
QTECH-STANDBY#
```

The following example redirects the master device console to the console of standby device 2 and exits.

```
QTECH#session device 2
QTECH-STANDBY#exit QTECH#
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

7.9. show switch id

Use this command to display the device ID.

show switch id

Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the device ID in the standalone mode.

```
QTECH#show switch id
Switch ID is 2
```

```
QTECH#show switch id
Switch ID is 1
```

The following example displays the device ID in the VSU device.

Related Commands

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



show switch virtual	Displays the domain ID as well as the ID and role of each
-----	chassis.

Platform Description

N/A

7.10. show switch virtual

Use this command to display the domain ID as well as the ID, status and role of the device.

show switch virtual

Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the domain ID as well as the ID, status and role of the device in standalone mode.

```
QTECH# show switch virtual
Current system is running in "STANDALONE" mode.
```

Related Commands

Platform Description

The following example displays the domain ID as well as the ID, status and role of each device in VSU mode.

```
QTECH#show switch virtual
Switch_id  Domain_id  Priority  Status  Role  Description
-----
```



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1 (1)	1 (1)	100 (100)	OK	ACTIVE	switch-1
2 (2)	1 (1)	100 (100)	OK	CANDIDATE	switch-2
3 (3)	1 (1)	100 (100)	OK	STANDBY	switch-3

Command	Description
switch	Modifies the device ID in standalone mode.
switch priority	Configures the device priority.
switch renumber	Modifies the device ID in VSU mode.
switch domain	Modifies the domain ID of a device in VSU mode.
switch virtual domain	Modifies the domain ID of a device in standalone mode.

N/A

7.11. show switch virtual balance

Use this command to display the load balance configuration in VSU mode.

show switch virtual balance

Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the load balance configuration of the device in VSU mode.

```
QTECH#show switch virtual balance
Aggregate port LFF: enable
```

Related Commands

Command	Description
<code>show switch virtual</code>	Displays the domain ID as well as the ID and role of the device.

Platform Description

N/A

7.12. show switch virtual config

Use this command to display the VSU configuration of the device in standalone or VSU mode.

`show switch virtual config [switch_id]`

Parameter Description

Parameter	Description
<code>switch_id</code>	Displays the VSU configuration of the specified device.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the VSU configuration of the device in standalone mode.

```
QTECH#show switch virtual config
mac: 00d0.f810.3323
!
switch virtual domain 1
!
switch 1
switch 1 priority 200
!
vsl-port
port-member interface GigabitEthernet 0/1 port-member interface GigabitEthernet
0/2
```



```
!  
switch convert mode standalone  
!
```

The following example displays the VSU configuration of the device in VSU mode.

```
QTECH#show switch virtual config switch id: 1 (mac: 00d0.f810.1111)  
!  
switch virtual domain 1  
!  
switch 1  
switch 1 priority 200  
switch 1 description switch1  
!  
vsl-port  
port-member interface GigabitEthernet 0/1 port-member interface  
GigabitEthernet 0/2  
!  
Switch convert mode virtual  
!  
  
switch_id: 2 (mac: 00d0.f810.2222)  
!  
switch virtual domain 1  
!  
switch 2  
switch 2 priority 100  
!  
vsl-port  
port-member interface GigabitEthernet Ethernet 0/1 port-member interface  
GigabitEthernet 0/2  
!  
Switch convert mode virtual  
!
```

The following example displays the VSU configuration of the device 1 in VSU mode.

```
QTECH#show switch virtual config 1 switch_id: 1 (mac: 00d0.f810.1111)  
!  
switch virtual domain 1  
!
```



```

switch 1
switch 1 priority 200
switch 1 description switch1
!
vsl-port
port-member    interface    GigabitEthernet    0/1    port-member    interface
GigabitEthernet 0/2
!

```

Related Commands

Command	Description
<code>show switch virtual</code>	Displays the domain ID as well as the ID and role of each chassis.

Platform Description

N/A

7.13. show switch virtual dual-active

Use this command to display the configuration of DAD.

`show switch virtual dual-active { bfd | aggregateport | summary }`

Parameter Description

Parameter	Description
<code>bfd</code>	Configuration of BFD-based DAD
<code>aggregateport</code>	Configuration of AP-based DAD
<code>summary</code>	Configuration and status of DAD

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the configuration and status of DAD.

```

QTECH# show switch virtual dual-active summary BFD dual-active detection
enabled: Yes Aggregateport dual-active detection enabled: No Interfaces

```

```
excluded from shutdown in recovery mode:
GigabitEthernet 1/0/3
```

```
GigabitEthernet 1/0/4
In dual-active recovery mode: No
```

The following example displays the configuration of BFD-based DAD.

```
QTECH# show switch virtual dual-active bfd BFD dual-active detection enabled:
Yes
BFD dual-active interface configured: GigabitEthernet 1/0/1: UP
GigabitEthernet 2/0/2: UP
```

```
QTECH# show switch virtual dual-active aggregateport Aggregateport dual-active
detection enabled: Yes Aggregateport dual-active interface configured:
AggregatePort 1: UP
GigabitEthernet 1/0/1: UP GigabitEthernet 2/0/1: UP GigabitEthernet 1/0/2: UP
GigabitEthernet 2/0/2: UP
DAD relay enable AP list:
AggregatePort 1
```

The following example displays the status of AP-based DAD.

Related Commands

Command	Description
dual-active detection	Enables DAD.
dual-active pair interface	Configures a DAD interface.
dual-active exclude interface	Configures an exclude interface.

Platform Description

N/A

7.14. show switch virtual link

Use this command to display the status of a virtual switch link (VSL).

show switch virtual link [port]

Parameter Description

Parameter	Description
port	Displays the port status of a VSL.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

Related Commands

Platform Description

The following example displays VSL link information.

```
QTECH# show switch link
VSL-AP State virtual link
Peer-VSL Rx Tx Uptime

1/1 UP 2/1 100000 100000 1d,4h,29m
2/1 UP 1/1 100000 100000 1d,4h,29m
```

The following example displays VSL port information.

```
QTEC sho switch virtual link
H# w Peer-VSL Rx Tx Uptime
VSL- State
AP
-----
1/1 U 2/1 10000 10000 1d,4h,29m
P 0 0
2/1 U 1/1 10000 10000 1d,4h,29m
P 0 0
```

The following example displays VSL port information.



```

QTECH# show switch virtual link port

switch 1:
Port                AP State  Peer-                Rx  Tx
port Uptime
-----
GigabitEthernet 1/0/1  1  OK  GigabitEthernet 2/0/1  900 9000
0d,0h,20m           0
GigabitEthernet 1/0/2  2  OK  GigabitEthernet 2/0/2    900 9000
0d,0h,20m           0

Switch 2:
Port                AP State  Peer-                Rx  Tx
port Uptime
-----
GigabitEthernet 2/0/1  1  OK  GigabitEthernet 1/0/1  900 9000
0d,0h,20m           0
GigabitEthernet 2/0/2  2  OK  GigabitEthernet 1/0/2    900 9000
0d,0h,20m           0
    
```

Command	Description
show switch virtual	Displays information about the VSU system.
show switch virtual role	Displays the ID, role, and priority of each device.

N/A

7.15. show switch virtual role

Use this command to display the ID, role, and priority of each chassis.

show switch virtual role

Parameter Description

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



N/A	N/A
-----	-----

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the domain ID as well as the ID, status and role of the device in standalone mode.

```
QTECH# show switch virtual
Current system is running in "STANDALONE" mode.
```

Related Commands**Platform Description**

The following example displays the domain ID as well as the ID, status and role of each device in VSU mode.

```
QTECH#show switch virtual
Switch_id    Domain_id    Priority    Status    Role    Description
-----
--
1 (1)        1 (1)        100 (100)  OK        ACTIVE  switch-1
2 (2)        1 (1)        100 (100)  OK        CANDIDATE  switch-2
3 (3)        1 (1)        100 (100)  OK        STANDBY  switch-3
```

Command	Description
switch priority	Configures the priority of a device in the VSU system.
switch virtual domain	Modifies the domain ID of a device in standalone mode.
show switch virtual link	Displays VSL information.

N/A

7.16. show switch virtual topology

Use this command to display the VSU topology connection status.

show switch virtual topology

Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

The following example displays the topology status.

```
QTECH# show switch virtual topology
Introduction: '[num]' means switch num, '(num/num)' means vsl-aggregateport num.

Chain Topology:
[1] (1/2) --- (2/1) [2]

Switch[1]: ACTIVE, MAC: 00d0.f822.33d6, Description: Switch1 Switch[2]:
STANDBY, MAC: 1234.5678.9003, Description: Switch2
```

Related Commands

Platform Description

Field Description

Field	Description
Ring Topology	Topology type.
Switch[-]	Device description.

Command	Description
N/A	N/A

7.17. switch

Parameter Description

Use this command to specify the ID of a device in the VSU system. Use the **no** form of this command to restore the default setting. **switch** *switch_id*

no switch

Parameter	Description
<i>switch_id</i>	ID of a device in the VSU system The range depends on products.

Defaults

The default is 1.

Command Mode

config-vs-domain configuration mode

Usage Guide

The device ID identifies each virtual device member. In VSU mode, the interface name format changes to "switch/slot/port" from "slot/port", in which "switch" is the device ID.

If either chassis are active or if the role of the just started chassis is uncertain and both have the same priority, the chassis with a smaller ID is elected as the active one.

This command can be only used to modify the device ID in standalone mode. In VSU mode, run the **switch renumber** command to modify the device ID. The modified device ID takes effect only

after you restart the device, regardless of in standalone mode or in VSU mode.

Configuration Examples

The following example sets the ID of the device whose domain ID is 1 to 2 in the VSU system.

```
QTECH(config)# switch virtual domain 1 QTECH(config-vs-domain)# switch 2
QTECH(config-vs-domain)# exit
```


Related Commands

Command	Description
<code>switch virtual domain</code>	Modifies the domain ID of a device in standalone mode.
<code>switch priority</code>	Configures the priority of a device in the VSU system.
<code>show switch virtual</code>	Displays the domain ID as well as the ID and role of each chassis.

Platform Description

N/A

7.18. switch convert mode

Use this command to perform conversion between the standalone mode and the VSU mode.

switch convert mode { **virtual** | **standalone** } [*switch_id*]

Parameter Description

Parameter	Description
virtual	VSU mode
standalone	Standalone mode
<i>switch_id</i>	Device ID

Defaults

The device is in standalone mode by default.

Command Mode

Privileged EXEC mode

Usage Guide

After you run the **switch convert mode virtual** command, the software automatically backs up the configuration file in standalone mode, saves it as a **standalone.text** file, and then deletes the **config.text** file. The software also prompts you whether to use the **virtual_switch.text** file to overwrite the **config.text** file, write the VSU-related configurations to the **config_vsu_dat** file, and then restart the device.

After you run the **switch convert mode standalone** command, the active

7. VSU Commands

chassis automatically backs up the configuration file in VSU mode, saves it as a **virtual_switch.text** file, and then deletes the **config.text** file. The active chassis also prompts you whether to use the **standalone.text** file to overwrite the **config.text** file and restart the device.

The **switch convert mode** command can be used in standalone mode or in VSU mode. In standalone mode, this command is used to switch the mode of the current chassis. In VSU mode, this command is used to switch the mode of the device specified by **switch_id** if **switch_id** is available and to switch the mode of the active device if **switch_id** is not available.

You are advised to first switch the mode of the standby device and then the mode of the active mode.

Configuration Examples

The following example converts the device mode from the standalone mode into the VSU mode.

```
QTECH# switch convert mode virtual
```

The following example switches the modes of the standby device (**switch_id** set to **2**) and the active device (**switch_id** set to **1**) from the VSU mode to the standalone mode.

```
QTECH# switch convert mode standalone 2
QTECH# switch convert mode standalone 1
```

Related Commands

Command	Description
switch	Modify the device ID in standalone mode.
switch virtual domain	Modify the domain ID of a device in standalone mode.
switch priority	Configure the priority of a device in the VSU system.
show switch virtual	Display the domain ID as well as the ID and role of each chassis.

Platform Description

N/A

7.19. switch crc

Use this command to configure parameters for frame error detection. Use the **no** form of this command to restore the

7. VSU Commands

default setting. **switch crc errors *error_num* times**

time_num

no switch crc

Parameter Description

Parameter	Description
<i>error_num</i>	Limits the number of error frames increasing from that in the last detection. If the increased number is greater than <i>error_num</i> , it is taken as an error.
<i>time_num</i>	When the error count exceeds the <i>time_num</i> , the device will take actions (prompting a message or disabling the port).

Defaults

The default *error_num* is 3. The default *time_num* is 10.

Command Mode

config-vs-domain configuration mode

Usage Guide

N/A

Configuration Examples

The following example sets the *error_time* and *time_num* parameters to 10 and 5 respectively.

```
QTECH(config)# switch virtual domain 1 QTECH(config-vs-domain)#
QTECH(config-vs-domain)#switch crc errors 10 times 5
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

7.20. switch description

Use this command to configure the description for a VSU switch. Use the **no** form of this command to remove the setting.

7. VSU Commands**switch** *switch_id* **description** *dev-name***no switch** *switch_id* **description****Parameter Description**

Parameter	Description
<i>switch_id</i>	Device ID
<i>dev_name</i>	Device description, no greater than 32 characters.

Defaults

N/A

Command Mode

config-vs-domain configuration mode

Usage Guide

This command is configured on a device in whether standalone or VSU mode and takes effect immediately after configuration,

Configuration Examples

The following example configures the description for a VSU switch.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# switch 1 description buildingA QTECH(config-vs-domain)# exit
```

Related Commands

Command	Description
N/A	N/A


Platform Description

N/A

7.21. switch domain

Use this command to modify the domain ID of a device in VSU mode. Use the **no** form of this command to restore the default setting. **switch** *switch_id* **domain**

*new_domain_id***no switch** *switch_id* **domain****Parameter Description**

Parameter	Description
<code>switch_id</code>	ID of the running device in VSU mode.  The range depends on products. For details, see the <i>Configuration Guide</i> .
<code>new_domain_id</code>	New domain ID, in the range from 1 to 255.

Defaults

The default `new_domain_id` is 100 by default.

Command Mode

`config-vs-domain` configuration mode

Usage Guide

Use this command only in VSU mode. In addition, the setting can take effect only after the device is restarted.

Configuration Examples

The following example sets the domain ID of device 1 to 10 in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# switch 1 domain 10
```

The following example sets the domain ID of device 2 to 10 in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# no switch 2 domain
```

The following example sets the domain ID of device 2 to the default value in VSU mode.

Related Commands

Command	Description
<code>switch virtual domain</code>	Modifies the domain ID in standalone mode.
<code>show switch virtual</code>	Displays the domain ID as well as the ID and role of each chassis.

Platform Description

N/A


7.22. switch priority

Use this command to configure the priority of a device in the VSU system. Use the **no** form of this command to restore the

default setting.

switch *switch_id* **priority** *priority_num*

no switch *switch_id* **priority**

Parameter	Description
<i>switch_id</i>	ID of a device in the VSU system.  The range depends on products. For details, see the
	<i>Configuration Guide.</i>
<i>priority_num</i>	Priority of a device in the VSU system, ranging from 1 to 255.

Defaults

The default *priority_num* is 100.

Command Mode

config-vs-domain configuration mode

Usage Guide

A larger value means a higher priority. The chassis with a higher priority is elected as the active chassis.

You can use this command in standalone mode or in VSU mode. The modified priority takes effect only after you restart the device.

In VSU mode, **switch_id** indicates the ID of the running device. If the ID does not exist, the configuration does not effect.

Configuration Examples

The following example sets the priority of device 1 to **200**.

```
QTECH(config)# switch virtual domain 1 QTECH(config-vs-domain)# switch 1
priority 200
QTECH(config-vs-domain)# exit
```

The following example sets the priority of device 1 to **200** and restores the priority of device 2 to the default value in VSU mode.

```
QTECH(config)# switch virtual domain 1 QTECH(config-vs-domain)# switch 1
priority 200 QTECH(config-vs-domain)# no switch 2 priority
QTECH(config-vs-domain)# exit
```

Related Commands

Command	Description
switch	Modifies the device ID in standalone mode.
show switch virtual	Displays the domain ID as well as the ID and role of each chassis.



Platform Description

N/A

7.23. switch renumber

Use this command to modify the ID of any device in VSU mode. Use the **no** form of this command to restore the default setting. **switch switch_id renumber**

*new_switch_id***no switch switch_id**

Parameter	Description
<i>switch_id</i>	ID of the running device in VSU mode  The range depends on products. For details, see the <i>Configuration</i>
	<i>Guide.</i>
<i>new_switch_id</i>	ID of the new switch  The range depends on products. For details, see the <i>Configuration Guide.</i>

Defaults

N/A

Command Mode config-vs-domain configuration mode**Usage Guide**

This command is configured in VSU mode. In addition and takes affect after device restart. The **no** form of this command will restore the switch ID to 1.

Configuration Examples

The following example modifies the ID of device 1 that is running to 2 in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# switch 1 renumber 2
```

The following example restores the ID of device 2 that is running to the default value in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# no switch 2
```

Related Commands

Command	Description
switch	Modifies the device ID in standalone mode.
show switch virtual	Displays the domain ID as well as the ID and role of each chassis.

Platform Description

N/A

7.24. switch virtual aggregateport lff enable

Use this command to enable the locally-preferred forwarding function on the AP in VSU mode. Use the **no** form of this command to disable this function.

switch virtual aggregateport lff enable

no switch virtual aggregateport lff enable

Parameter Description

Parameter	Description
N/A	N/A

Usage Guide

N/A

Configuration Examples

The following example enables the locally-preferred forwarding function on the AP in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)# switch virtual aggregateport lff enable
```

Related Commands

Command	Description
show switch virtual balance	Displays the current traffic balancing mode.

Platform Description

N/A

7.25. switch virtual domain

Use this command to modify the domain ID of a device in standalone mode, or enter config-vs-domain configuration mode in VSU mode.

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

switch virtual domain *domain_id*

no switch virtual domain

Parameter Description

Parameter	Description
<i>domain_id</i>	Domain ID of the VSU, in the range from 1 to 255.

Defaults

The default is 100.

Command Mode

Global configuration mode

Usage Guide

Only two devices with the same domain ID can form a virtual device. The domain ID must be unique within the local area network (LAN).

Configuration Examples

The following example sets the domain ID of the VSU to 1 in standalone mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)#
```

Related Commands

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

7. VSU Commands

show switch virtual	Displays the domain ID as well as the ID and role of each chassis.
switch domain	Modifies the domain ID in VSU mode.

Platform Description

N/A

7.26. switch virtual ecmp lff enable

Use this command to enable the locally-preferred forwarding function on the ECMP interface in VSU mode.

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

switch virtual ecmp lff enable

no switch virtual ecmp lff enable

Parameter Description

Parameter	Description
N/A	N/A

Defaults

This function is enabled by default.

Command Mode

config-vs-domain configuration mode

Usage Guide

N/A

Configuration Examples

The following example enables the locally-preferred forwarding function on the ECMP interface in VSU mode.

```
QTECH(config)# switch virtual domain 1
QTECH(config-vs-domain)#switch virtual ecmp lff enable
```

Related Commands

Command	Description
show switch virtual balance	Displays the current load balance mode.

Platform Description

N/A

7.27. vsl-port

Parameter Description

Use this command to

Parameter	Description
N/A	N/A

enter VSL-PORT mode

vsl-port

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

This command is configured on a device in whether standalone mode or VSU mode.

Configuration Examples

The following example enters VSL-AP configuration mode on a device in standalone mode.

```
QTECH(config)# vsl-port
QTECH(config-vsl-port)#
```

The following example enters VSL-APPORT configuration mode on a device in VSU mode.

```
QTECH(config)# vsl-port
QTECH(config-vsl-port)#
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.1. delay

Use this command to specify a period of time after which the tracked object status will change if the interface status changes.

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

delay { **up** *seconds* [**down** *seconds*] | [**up** *seconds*] **down** *seconds* }

no delay

Parameter Description

Parameter	Description
up <i>seconds</i>	Sets the delay time from down to up in the range from 0 to 180. The unit is second.
down <i>seconds</i>	Sets the delay time from up to down in the range from 0 to 180. The unit is second.

Defaults

There is no delay by default.

Command Mode

Track configuration mode

Usage Guide

The continual oscillation of the tracked object status may cause the client of this tracked object changing also. This command can be used to delay advertising the change of the tracked object status. For example, the status of a tracked object changes from up to down, if the delay down 180 is configured, the down status will be advertised after 180 seconds. If the tracked object status changes to the up again in this period, it won't be advertised. For the client of the tracked object, the status of the tracked object is always up.

Configuration Examples

The following example sets the delay time to 30 seconds when the tracked object changes to up from down.

```
QTECH(config)# track 5 rns 10 QTECH(config-track)# delay up 30
QTECH(config-track)# end
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.2. dns

Parameter Description

Parameter	Description
<i>destination-hostname</i>	Sets the destination IP address or the destination host domain name.
oob	Enables management port detection.
<i>a.b.c.d</i>	Sets the IP address for the DNS server.
<i>ip-address</i>	Indicates the source IP address of RNS packets.
out-interface <i>type num</i>	Specifies the egress interface (non-management port) for RNS packets.
via <i>type num</i>	Specifies the management port as the egress interface (non-management port) for RNS packets.
<i>A.B.C.D</i>	Specifies the next-hop IP address for RNS packets.

Use this command to set an IP RNS object to send the DNS packets and to enter the IP RNS DNS mode.

```
dns {destination-hostname name-server a.b.c.d [ source-ipaddr ip-address ] [out-interface type num [ next-hop A.B.C.D ] ] | oob destination-hostname name-server a.b.c.d [ source-ipaddr ip-address ] via type num next-hop A.B.C.D}
```

Defaults

N/A

Command Mode

IP RNS configuration mode

Usage Guide

Use this command to set an IP RNS object to send the DNS packets and to enter the IP RNS DNS mode. If you want to change the probe type, you should delete the probe first by using the **no ip rns** command and then perform new configuration.

Configuration Examples

The following example sets the IP RMS object to send the DNS packets.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# dns www.QTECH.com.cn name-server 61.154.22.41
QTECH(config-ip-rns-dns)# exit
QTECH(config)# ip rns schedule 1 start-time now
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.3. frequency

Use this command to set the interval of sending the packets, which must be no smaller than the timeout time.

Use the no form of this command to restore the default setting.

frequency *milliseconds*

no frequency

Parameter Description

Parameter	Description
<i>milliseconds</i>	Sets the interval of sending the packets, in the range from 10 to 604,800,000 in the unit of milliseconds.

Defaults

The default is 60 seconds.

Command Mode

IP RNS ICMP echo configuration

mode IP RNS DNS configuration

mode

IP RNS TCP configuration mode

Usage Guide

Use this command to set the interval of sending the ICMP echo or DNS packets, which must accord with the following formula to ensure accuracy:

$\text{frequency milliseconds} > \text{timeout milliseconds} \geq \text{threshold milliseconds}$

Configuration Examples

The following example configures an ICMP echo probe whose destination address is 192.168.21.1. The frequency, timeout time and threshold are set to 30,000, 8,000 and 6,000 milliseconds respectively.

```
QTECH(config-ip-rns)#icmp-echo 192.168.21.1
QTECH(config-ip-rns-icmp-echo)#frequency 30000
QTECH(config-ip-rns-icmp-echo)#timeout 8000
QTECH(config-ip-rns-icmp-echo)#threshold 6000
```

Related Commands

Command	Description
<code>timeout</code>	Defines the timeout time of sending the packets.

Platform Description

N/A

8.4. icmp-echo

Use this command to configure an ICMP echo RNS probe.

`icmp-echo { destination-ip-address | destination-hostname [name-server ip-address]`

Parameter Description

Parameter	Description
<code>destination-hostname</code>	Sets the destination IP address for the ICMP echo packets.
<code>oob</code>	Enables management port detection.

<i>destination-hostname</i>	Sets the destination host name within 127 characters. The exceeding characters are truncated automatically.
name-server <i>ip-address</i>	Sets the domain name server. The default domain name server is configured via the ip name-server command.
source-ipaddr <i>ip-address</i>	Sets the source IP address for the ICMP echo packets.
out-interface <i>type num</i>	Sets the egress port(non-management) for the probe packet.
via <i>type num</i>	Specifies the management port as the egress interface (non-management port) for probe packets.
next-hop <i>A.B.C.D</i>	Sets the next hop IP address.

```
[ source-ipaddr ip-address ] [out-interface type num [ next-hop A.B.C.D ] ] | oob
{ destination-ip-address | destination-hostname [ name-server ip-address ] } [ source-ipaddr
ip-address ] via type num next-hop A.B.C.D
```

Command Mode

Defaults

N/A

IP RNS configuration mode

Usage Guide

This command is used to enable the IP RNS object to send ICMP echo packets containing the specified destination IP address. The default payload size of an ICMP echo packet is 36 bytes. The request-data-size command is used to modify the packet size.

You can modify the probe parameter after specifying the type of the IP RNS probe (such as ICMP echo probe). If you want to change the probe type, you should delete the probe first by using the no ip rns command and then perform new configuration.

Configuration Examples

The following example enables the IP RNS object to send the ICMP echo packets containing the destination IP address 10.1.1.1.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1 QTECH(config-ip-rns-icmp-echo)# exit
```

Related Commands

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

N/A	N/A
-----	-----

Platform Description

N/A

8.5. ip rns

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the IP RNS operation object number, in the range from 1 to 500.
dns <i>destination-hostname</i> name-server <i>ip-address</i>	Brief DNS detection configuration. <i>destination-hostname</i> : Indicates the destination host name. A maximum of 127 characters can be entered. Characters out of this limit will be truncated. name-server <i>ip-address</i> : Indicates the IP address of the DNS server.
icmp-echo <i>destination-ip-address</i>	Brief ICMP-echo detection configuration. <i>destination-ip-address</i> : Indicates the destination IP address.
tcp-connect <i>destination-ip-address</i> <i>port-number</i>	Brief TCP-connect detection configuration. <i>destination-ip-address</i> : Indicates the destination IP address. <i>port-number</i> : Indicates the TCP port to be detected.
frequency <i>seconds</i>	Sets the detection interval. For details, see the frequency command.
timeout <i>milliseconds</i>	Sets the timeout time for one IP RNS detection operation. For details, see the timeout command.
threshold <i>milliseconds</i>	Sets the upper threshold for one IP RNS detection operation. For details, see the threshold command.

Use this command to define an IP RNS operation object and to enter the IP RNS configuration mode. Use the **no** form of this command to delete an IP RNS operation object.

ip rns *operation-number* [{**dns** *destination-hostname* **name-server** *ip-address* | **icmp-echo** *destination-ip-address* | **tcp-connect** *destination-ip-address* *port-number*} [**frequency** *seconds*] [**timeout** *milliseconds*] [**threshold** *milliseconds*]]]

no ip rns *operation-number*

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

Currently, the RNS supports only IPv4-related tests, but not IPv6-related tests. At most 500 tests can be configured, depending on the performance of devices. The test function is only a value-added function. When a large number of tests are configured and consume a lot of system resources, the test function may be temporarily disabled to ensure normal operation of core services, such as route forwarding.

Detailed configuration (executing mandatory items of **ip rns operation-number**): Run this command and enter the IP-RNS configuration mode. In this mode, you can define various test types. If the test type is not configured, the RNS test is not created. After configuring an RNS test, you must run the **ip rns schedule** command to configure its schedule parameters; otherwise, the test cannot be conducted.

After configuring the type of an RNS test, you can run the **ip rns** command to enter the mode of the test type. To modify the type of an RNS instance, you need to first delete the RNS instance by running the **no ip rns** command in global configuration mode.

Configuration Examples

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1
QTECH(config-ip-rns-icmp-echo)# threshold 10000
QTECH(config-ip-rns-icmp-echo)# timeout 20000
QTECH(config-ip-rns-icmp-echo)# frequency 30000
QTECH(config-ip-rns-icmp-echo)# exit
QTECH(config)# ip rns schedule 1 start-time now life forever
```

The following example defines the IP RNS object 1.

Related Commands

Command	Description
show ip rns statistics	Displays the statistical data on the IP RNS object.

Platform Description

N/A

8.6. ip rns reaction-configuration

Use this command to configure proactive threshold monitoring and trigger for the IP RNS probe. Use the no form of this command to restore the default setting.

```
ip rns reaction-configuration operation-number react monitored-element [ action-type option ]
```

```
[ threshold-type { average [ number-of-measurements ] | consecutive [ occurrences ] | immediate
```

```
| never | xofy [ x-value y-value ] } ] [ threshold-value upper-threshold lower-threshold ]
```

```
no ip rns reaction-configuration operation-number [ react monitored-element ]
```

Parameter Description

Parameter	Description
operation-number	Operation index, in the range from 1 to 500.
monitored-element	<ul style="list-style-type: none">• Monitored element. The available parameters are listed as follows:• allfail: Failed to monitor all elements. The default action-type is track. This parameter is applied on the track module for communication.• rtt: Packet round trip time (RTT) exceeds the threshold range.• timeout: Timeout in whatever direction.
action-type option	<ul style="list-style-type: none">• The available parameters include:• none: No action, which is the default setting• trigger: Only supports the trigger action.

	<ul style="list-style-type: none"> □ track: Only supports the track action. Only when monitored-element is allfail is this parameter supported, which is available exclusively.
average [<i>number-of-measurements</i>]	Triggers operation when the average value of number-of-measurements consecutive times exceeds the threshold range. For example. <i>number-of-measurements</i> is set to three. Upper and lower thresholds are 5000 and 4000 respectively. The average value for three consecutive measurements 6000. 6000. 5000 is $(6000+6000+5000)/3=5667$, exceeding the upper threshold 5000. The valid range is from 1 to 16 and the default is 5.
consecutive [<i>occurrences</i>]	Triggers operation when the value of monitored element exceeds the threshold range for <i>occurrences</i> consecutive times. The valid range is from 1 to 16. The default is 5.
immediate	Triggers operation immediately when the value of monitored element exceeds the threshold range.
never	Never triggers operation.
xofy [<i>x-value y-value</i>]	X probes among the latest Y ones exceed the threshold range. The valid X range is from 1 to 16 and the default is 5. The valid Y range is from 1 to 16 and the default is 5.
threshold -value <i>upper-</i> <i>threshold</i> <i>lower-</i>	Configures upper and lower thresholds. When <i>monitored-element</i> is rtt , this parameter indicates time, in the range from 0 to 60,000 milliseconds. See Usage Guide for the default setting.

<i>threshold</i>	When react type is timeout, you don't need to configure this parameter.
------------------	---

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

One IP RNS object can be configured with multiple thresholds monitoring, each for one element.

Monitored elements that are supported vary with different probe types.

monitored-element	icmp-echo	dns	tcp-connect
timeout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
rtt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The default thresholds for monitored elements are listed as follows:

Monitored Element	Upper Threshold	Lower Threshold
timeout	-	-
rtt	5000 ms	0 ms

Configuration Examples

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 192.168.23.1
```

The following example configures RNS1 and its threshold monitoring.

```
QTECH(config-ip-rns-icmp-echo)# exit
QTECH(config)# ip rns schedule 1 start-time now life forever QTECH(config)#ip
rns reaction-configuration 1 react timeout threshold-type immediate action-
type triggerOnly
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.7. ip rns reaction-trigger

Use this command to enable the IP RNS probe which exceeds the monitoring threshold to trigger another IP RNS probe which is in the pending state.

Use the no form of this command to restore the default setting.

`ip rns reaction-trigger operation-number target-operation`

`no ip rns reaction-trigger operation-number target-operation`

Parameter Description

Parameter	Description
<i>operation-number</i>	The source operation number, in the range from 1 to 500
<i>target-operation</i>	The target operation number, in the range from 1 to 500

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

The trigger function is applied in network fault diagnosis scenario

Configuration Examples

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo www.google.com
QTECH(config-ip-rns-icmp-echo)# exit
QTECH(config)# ip rns schedule 1 start-
```

The following example enables IP RNS1 to trigger IP RNS 2.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.8. ip rns reset

Use this command to clear all IP RNS configuration.

```
ip rns reset
```

Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

This command is used to clear all IP RNS configuration. This command is used only in extreme cases (for example, RNS probe configuration is wrong).

Configuration Examples

Related Commands

Platform Description

The following example clears all IP RNS configuration.

```
QTECH(config)# ip rns reset
```

Command	Description
N/A	N/A

N/A

8.9. ip rns restart

Use this command to restart the IP RNS probe.

```
ip rns restart operation-number
```

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the IP RNS operation object number, in the range from 1 to 500.

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

This command is used to restart the IP RNS probe whose schedule is in the pending state. This command is invalid for the IP RNS probe not configured with the scheduling policy.

Configuration Examples

Related Commands

Platform Description

The following example restarts IP RNS 1.

```
QTECH(config)# ip rns restart 1
```


Command	Description
N/A	N/A

N/A

8.10. ip rns schedule

Use this command to configure the scheduling strategy, start time and survival time for the IP RNS probe. Use the **no** form of this command to restore the default setting.

ip rns schedule operation-number [**life** { **forever** | *seconds* }] [**start-time** { *hh:mm* [*:ss*]

[*month* | *day* | *day month*] | **pending** | **now** | **after** *hh:mm:ss* }] [**recurring**]

no ip rns schedule operation-number

Parameter Description

Parameter	Description
<i>operation-number</i>	RNS operation index, in the range from 1 to 500
life forever	The RNS operation is valid forever.
life seconds	The RNS survival time, measured in seconds
<i>hh:mm</i> [<i>:ss</i>]	Defines the time when the operation starts,
<i>month</i>	The month when the operation starts, in the range from January (Jan.) to December (Dec.). The default is the current month.
<i>day</i>	The day when the operation starts, in the range from 1 to 31. The default is the current day.
pending	The start time is pending.
now	The operation starts right now.
after <i>hh:mm:ss</i>	The operation starts after hh hours, mm minutes and ss seconds.
recurring	The operation starts automatically as scheduled every day.

Defaults

The IP RNS probe is in the pending state by default. In other words, the probe is not performed unless it is triggered by another RNS probe.

Command Mode

Global configuration mode

Usage Guide

The `ip rns schedule` command is used to configure the IP RNS probe with scheduling policy. Once the scheduling policy is configured, the RNS probe cannot be modified. You can modify the RNS probe after deleting the schedule with the `no ip rns schedule` command.

`Life {seconds}` refers to the survival time of the IP RNS probe. The probe will end after the survival time.

Configuration Examples

The following example configures the RNS probe with scheduling policy.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1 QTECH(config-ip-rns-icmp-echo)# exit
QTECH(config)# ip rns schedule 1 start-time now life forever
```

Once the scheduling policy is configured, the RNS probe cannot be modified. The RNS probe can be modified after the schedule is deleted.

```
QTECH(config)# ip rns 1
Entry already running and cannot be modified (only can delete (no) and start over)
(check to see if the probe has finished exiting) QTECH(config)# no ip rns schedule 1
QTECH(config)# ip rns 1
QTECH(config-ip-rns-icmp-echo)# exit
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.11. object

Use this command to add a tracked object to the object track list. Use the **no** form of this command to delete a tracked object. **object** *object-number* [**not**]

no object *object-number*

Parameter Description

Parameter	Description
<i>object-number</i>	Tracked object number, in the range from 1 to 700

Defaults

No tracked object is configured by default.

Command Mode

Track configuration mode

Usage Guide

This command is used to add a tracked object to the object track list. The number of tracked objects is only restricted by the track list capacity.

object *object-number*: The tracked object must be in the up state for the track list to be in the up state.

object *object-number* not: track: The tracked object must be in the up state for the track list to be in the up state,

- ❖ This command is configured only in track configuration mode for the track list.
- ❖ The object cannot track itself.
- ❖ The objects cannot track each other. For example, if A tracks B, B cannot track A. Otherwise, both A and B are in oscillation.

Configuration Examples

The following example adds tracked object 4 to the object track list. When object 1 is in the up state, 2 down, 3 up, object 4 is in the up state.

```
QTECH(config)# track 4 list boolean and QTECH(config-track)# object 1
QTECH(config-track)# object 2 not QTECH(config-track)# object 3
QTECH(config-track)# end
```

Related Commands

Command	Description
N/A	N/A

Platform Description

8.12. request-data-size

Use the following example to set the protocol payload size of IP RNS probe packet. Use the **no** form of this command to restore the default setting.

request-data-size *bytes*

no request-data-size

Parameter Description

Parameter	Description
<i>bytes</i>	The number of payload bytes. The minimum/maximum number of bytes varies with the probe type.

Defaults

The default is the minimum payload byte, which varies with the probe type.

Command Mode

P RNS ICMP echo configuration mode

Usage Guide

This command is used to fill bytes in the probe packet to probe for the bigger packet.

Probe Type	Range	Default
icmp-echo	[36, 1472]	36

Configuration Examples

The following example sets the protocol payload size of the IP RNS probe packet to 50.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1
QTECH(config-ip-rns-icmp-echo)# request-data-size 50
QTECH(config-ip-rns-icmp-echo)# exit
```

Related Commands

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

N/A

N/A

Platform Description

N/A

8.13. show ip rns collection-statistics

Use this command to display statistics about the RNS probe.

show ip rns collection-statistics [*operation-number*]

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the IP RNS operation object number, in the range from 1 to 500. The default is all IP RNS operation objects.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

This command is used to display statistics about an IP RNS probe.

Configuration Examples

The following example displays statistics about the all RNS probes.

```
QTECH#show ip rns collection-statistics 1 Entry number: 1
Start Time Index: *2014-03-20 19:53:51
Number of successful operations: 919
```

Number of operations over threshold: 0

Number of failed operations due to a Disconnect: 0 Number of failed operations due to a Timeout: 2 Number of failed operations due to a Busy: 0



Number of failed operations due to a No Connection: 0 Number of failed operations due to an Internal Error: 2 Number of failed operations due to a Sequence Error: 0 Number of failed operations due to a Verify Error: 0 RTT Values:

RTTAvg: 18 RTTMin: 16 RTTMax: 37

NumOfRTT: 919 RTTSum: 16654 RTTSum2: 302786

Field	Description
Entry number	IP RNS operation index
Start Time Index:	Schedule start time
Number of successful operations:	Number of successful operation.
Number of operations over threshold:	Number of threshold violation
Number of failed operations due to a Disconnect:	Number of operation failure due to disconnection
Number of failed operations due to a Timeout:	Number of operation failure due to timeout
Number of failed operations due to a Busy:	Number of operation failure since the peer end is busy
Number of failed operations due to a No Connection:	Number of operation failure due to no connection
Number of failed operations due to an Internal Error:	Number of operation failure due to internal error
Number of failed operations due to a Sequence Error:	Number of operation failure due to sequence error
Number of failed operations due to a Verify Error:	Number of operation failure due to verification error

RTT Values	RTT value
RTTAvg:	Average RTT value
RTTMin:	Minimum RTT value
RTTMax:	Maximum RTT value
NumOfRTT:	Number of counting RTT value
RTTSum:	Sum of RTT value
RTTSum2:	Sum of squares of RTT value

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.14. show ip rns configuration

Use this command to display the RNS instance configuration.

show ip rns configuration [*operation-number*]

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the RNS instance number, in the range from 1 to 500.

Command Mode

Privileged EXEC mode

Usage Guide

This command is used to display the RNS instance configuration. The configuration varies with different packet types.

Configuration Examples

Related Commands

Command	Description
N/A	N/A

The following example displays the RNS 1 configuration.

```
QTECH# show ip rns configuration 1 Entry number: 1
Tag: QTECH555
Type of operation to perform: icmp-echo Operation timeout
(millisecons): 5000 Operation frequency (millisecons): 10000
Threshold (millisecons): 5000
Recurring (Starting Everyday): FALSE Life (seconds): 3500
Next Scheduled Start Time:Start Time already passed Target
address/Source address: 2.2.2.3/0.0.0.0
Request size (ARR data portion): 36
```

Field	Description
Entry number	IP RNS operation index
Tag	Instance tag.
Type of operation to perform	Operation type.
Operation timeout (millisecons)	Operation timeout.
Operation frequency (millisecons)	Operation frequency.
Threshold (millisecons)	Threshold.
Recurring (Starting Everyday)	The operation starts every day.
Life (seconds)	Life time
Next Scheduled Start Time	Next scheduled start time.
Target address/Source address	Target address/Source address
Request size (ARR data portion)	Request packet size.

Platform Description

8.15. show ip rns operational-state

Use this command to display operational state.

show ip rns operational-state [*operation-number*]

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the IP RNS operation object number, in the range from 1 to 500. The default is all RNS operation objects.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

This command is used to display the state information about an RNS probe.

Configuration Examples

The following example displays the state information about all RNS probes.

```
QTECH# show ip rns operational-state Entry
number: 1
Modification time: *2014-01-10 10:26:14 Current
seconds left in Life: Forever Operational state of
entry: Active
Number of Octets Used by this Entry: 2272 Number of
operations attempted: 232 Number of operations
skipped: 0 Connection loss occurred: FALSE
Timeout occurred: FALSE
Over thresholds occurred: FALSE Latest RTT
(milliseconds): 4
Latest operation start time: 2014-01-10 10:26:55
Latest operation return code: OK
```

Field	Description
Entry number	IP RNS operation index
Modification time	Probe result recounting time (every time schedule is enabled, the result is counted again).
Number of operations attempted	Number of attempted operation.
Number of operations skipped	Number of failed operation.
Current seconds left in Life	Probes for the left life.
Operational state of entry	Probes for the operational state (Active/Disactive).
Connection loss occurred	Connection loss occurred.
Timeout occurred	Send request timeout occurred,
Over thresholds occurred	Threshold violation occurred.
Latest RTT (milliseconds)	Latest RTT.
Latest operation start time	Latest operation start time.
Latest operation return code	Latest operation return code.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.16. show ip rns reaction-configuration

Use this command to display the proactive threshold monitoring information of an IP RNS probe.

```
show ip rns reaction-trigger [ operation-number ]
```

Parameter Description

Parameter	Description
<i>operation-number</i>	The number of IP RNS operation objects, in the range from 1 to 500. The default is all RNS operation objects.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

This command is used to display the proactive threshold monitoring information of an IP RNS probe.

Configuration Examples

```
QTECH#show ip rns reaction-configuration Entry
number: 1
Reaction: rtt Threshold Type:
Never
Rising (milliseconds): 5000
Falling (milliseconds): 3000
Threshold Count: 5
```

The following example displays the proactive threshold monitoring information of all IP RNS probes.

```
Threshold Count2: 5 Action Type: trigger Reaction: timeout Threshold Type:
Never Threshold Count: 5
Threshold Count2: 5
Action Type: trigger
```

Field	Description
Entry number	IP RNS operation index
Reaction	Monitored object

Threshold Type	<p>The available parameters are listed as follows:</p> <p>never: Never triggers operation.</p> <p>consecutive: Triggers operation when the value of monitored element exceeds the threshold range for <i>occurrences</i> consecutive times. average: Triggers operation when the average value of number-of-measurements consecutive times exceeds the threshold range.</p> <p>immediate: Triggers operation immediately when the value of monitored element exceeds the threshold range.</p> <p>xofy: X probes among the latest Y ones exceed the threshold range.</p>
Rising (milliseconds)	Upper threshold
Falling (milliseconds)	Lower threshold
Threshold Count	The parameter refers to the x value when the threshold-type is xofy or the average count when the threshold-type is average .
Threshold Count2	The parameter refers to the y value when the threshold-type is xofy or the consecutive count when the threshold-type is consecutive .
Action Type	Action type

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.17. show ip rns reaction-trigger

Use this command to display the reaction trigger information for all RNS objects.

show ip rns reaction-trigger [*operation-number*]

Parameter Description

Parameter	Description
<i>operation-number</i>	The number of IP RNS operation object, in the range from 1 to 500. The default is all RNS operation objects.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

This command is used to display the reaction trigger information for all RNS objects.

Configuration Examples

Related Commands

Platform Description

The following example displays the reaction trigger information for all RNS objects.

```
QTECH#show ip rns reaction-trigger Entry number: 1
Target rns index: 2
Status of Entry (SNMP RowStatus): active Operational State: pending
```

Field	Description
Entry number	RNS index
Target rns index	Target RNS index
Status of Entry (SNMP RowStatus)	Status of RNS entry
Operational State	Reaction-trigger state

Command	Description
N/A	N/A

N/A

8.18. show ip rns statistics

Use this command to display the RNS object statistics.

show ip rns statistics [*operation-number*]

Parameter Description

Parameter	Description
<i>operation-number</i>	Sets the IP RNS operation object number, in the range from 1 to 500

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

The statistics vary with different packet types.

Configuration Examples

The following example displays the RNS object statistics.

```
QTECH#show ip rns statistics 1 Round trip
time(RTT) Index 1 Operation time to live:
Forever Latest RTT: 1 ms
Latest operation start time: 2014-01-20 10:21:38 Latest
operation return code: OK
Number of successes: 386
Number of failures: 12
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.19. show track

Use this command to display statistics of the tracked object.

```
show track [ track-number ]
```

Parameter Description

Parameter	Description
<i>track-number</i>	Sets the tracked object number, in the range from 1 to 700.

Defaults

N/A

Command Mode

Privileged EXEC mode

Usage Guide

N/A

Configuration Examples

Related Commands

Platform Description

The following example displays statistics of all tracked objects.

```
QTECH#show track Track 1
Reliable Network Service 5 The state is Up
1 change, current state last: 120 secs Delay up 30 secs, down 50 secs
Track 3
Interface FastEthernet 1/0
The state is Down, delayed Up (5 secs remaining)
3 change, current state last: 300 secs Delay up 60 secs, down 60 secs
Track 4
List boolean and Object 1
Object 2 not The state is Up
1 change, current state last: 100 secs
Delay up 0 secs, down 0 secs
```

Field	Description
Track x	Tracked object ID
Reliable Network Service x	Tracked RNS object
The state is x	Tracked object state
x change	Tracked object change count
current state last: x secs	The time for which the current state lasts
Delay up x secs, down x secs	The delay state of the tracked object
Interface x x	Tracked interface
The state is x, delayed y (c secs remaining)	The tracked object state is x, and will turn to y in c seconds.

List boolean and	The Boolean expression enables calculation by using “and” operator.
Object x	Object x is in the up state.
Object x not	Object x is in the down state.

Command	Description
N/A	N/A

N/A

8.20. tag

Parameter Description

Parameter	Description
<i>text</i>	Sets the tag for IP RNS probe, which is composed of up to 79 printable characters.

Use this command to set the tag for IP RNS probe.

Use the no form of this command to restore the default setting.

tag *text*

no tag

Defaults

N/A

Command Mode

IP RNS DNS configuration mode

IP RNS ICMP echo configuration mode

Usage Guide Tag is used to identify the probe. When the tag exceeds 79 characters, the surplus characters are truncated.

Configuration Examples

The following example sets the tag for IP RNS probe to telecom gateway.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1 QTECH(config-ip-rns-
icmp-echo)# tag telecom_gateway QTECH(config-ip-rns-icmp-echo)#
exit
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.21. tcp-connect

Use this command to configure TCP connectivity probe.

```
tcp-connect { destination-ip-address | destination-hostname [ name-server ip-address ] }
port-number
```

Parameter Description

Parameter	Description
<i>destination-ip-address</i>	Destination IP address
<i>destination-hostname</i>	Destination domain name
<i>name-server ip-address</i>	IP address of the DNS server
<i>port-number</i>	TCP port number

Defaults

N/A

Command Mode

IP RNS configuration mode

Usage Guide

TCP connectivity probe detects the connection with the TCP server.

If no peer TCP server exist, enable the IP RNS server function on peer QTECH devices.

Configuration Examples

```
QTECH(config)# ip rns 1
QTECH(config)# tcp-connect www.QTECH.net name-server 8.8.8.8 999
QTECH(config-ip-rns-tcp-connect)# exit
QTECH(config)# ip rns schedule 1 start-time now life forever
```

The following example configures TCP connectivity probe.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.22. threshold

Use this command to configure the upper threshold value for IP RNS probe. Use the no form of this command to restore the default setting.

threshold *milliseconds*

no threshold

Parameter Description

Parameter	Description
<i>milliseconds</i>	Sets the upper threshold value, in the range from 0 to 60,000 in the unit of milliseconds.

Defaults

The default is 5,000 milliseconds.

Command Mode

IP RNS DNS configuration mode

IP RNS ICMP echo configuration mode IP RNS TCP configuration mode

Usage Guide

The threshold value must be no greater than the timeout value. See Usage Guide of the frequency

command for the relationship among timeout, frequency and threshold.

Configuration Examples

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1
QTECH(config-ip-rns-icmp-echo)# threshold 8000
QTECH(config-ip-rns-icmp-echo)# exit
```

The following example sets the upper threshold value for IP RNS probe to 8,000 milliseconds.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.23. timeout

Use this command to set the timeout time of an IP RNS probe. Use the **no** form of this command to restore the default setting. **timeout** *milliseconds*

no timeout

Parameter Description

Parameter	Description
<i>milliseconds</i>	Sets the timeout time, in the range from 10 to 604,800,000 in the unit of milliseconds. The default is 5,000 milliseconds.

Defaults

The default timeout of an IP RNS probe varies with the detection type, which can be displayed by using **show ip rns configuration** command.

Command Mode

IP RNS ICMP echo configuration mode IP RNS DNS configuration mode
IP RNS TCP configuration mode

Usage Guide

The timeout value must be no smaller than the threshold value. See **Usage Guide** of the **frequency**

command for the relationship among timeout, frequency and threshold.

Configuration Examples

The following example sets the timeout time of an IP RNS probe to 10,000 milliseconds.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1
QTECH(config-ip-rns-icmp-echo)# timeout 10000
QTECH(config-ip-rns-icmp-echo)# exit
```

Related Commands

Command	Description
frequency <i>milliseconds</i>	Sets the interval of sending the packets.

Platform Description

N/A

8.24. tos

Parameter Description

Parameter	Description
<i>number</i>	Sets the ToS field in the IPv4 header of an IP RNS probe packet, in the range from 0 to 255.

Use this command to set the Type of Service (ToS) field in the IPv4 header of an IP RNS probe packet.

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

tos *number*

no tos

Defaults

The default is 0.

Command Mode

IP RNS DNS configuration mode

IP RNS ICMP echo configuration mode IP RNS TCP configuration mode

Usage Guide

ToS is an 8-bit field of an IPv4 packet. ToS can be used to set probe packet priority. Different ToS corresponds to different priority.

Configuration Examples

The following example sets the ToS field in the IPv4 header of an IP RNS probe packet to 128.

```
QTECH(config)# ip rns 1
QTECH(config-ip-rns)# icmp-echo 10.1.1.1
QTECH(config-ip-rns-icmp-echo)# tos 128
QTECH(config-ip-rns-icmp-echo)# exit
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

8.25. track interface line-protocol

Use this command to configure a tracked object to track the interface status and enter the track mode.

Parameter Description

Use the **no** form of this command to delete a tracked object.

track *object-number* **interface** *interface-type* *interface-number* **line-protocol** **no track** *object-number*

Defaults

Parameter	Description
<i>object-number</i>	Sets the tracked object number, in the range of 1 to 700.
<i>interface-type</i> <i>interface-number</i>	Sets the interface type and the interface number.

Command Mode

Global configuration mode

Usage Guide

This command is used to configure a tracked object to track the link state of the interface. If the link state of the interface is up, the state of the corresponding tracked object is up too.

Configuration Examples

Related Commands

Platform Description

The following example configures the object “track 3” to track the link state of ethernet 0/1.

```
QTECH(config)# track 3 interface ethernet 0/1 line-protocol
```

Command	Description
track rns	Configures a tracked object to track the operating status of an rns object.
show track	Displays the tracked object related information.

N/A

8.26. track list

Use this command to configure a tracked list object and specify the state of the tracked list based on a Boolean calculation.

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

`track object-number list boolean { and | or } no track object-number`

Parameter Description

Parameter	Description
<i>object-number</i>	Sets the number of the tracked object, in the range from 1 to 700.

Command Mode

Global configuration mode

Usage Guide

This command is used to configure a tracked list object and specify the state of the tracked list based on a Boolean calculation

- ❖ **track *object-number* list boolean and:** Configure a tracked list with a Boolean expression using “AND” operator.
- ❖ **track *object-number* list boolean or:** Configure a tracked list with a Boolean expression using “OR” operator.

Configuration Examples**Related Commands****Platform Description**

The following example configures tracked list object “4” and specifies the state of the tracked list based on a Boolean calculation using operator “AND”.

```
QTECH(config)# track 4 list boolean and
```

Command	Description
N/A	N/A

N/A

8.27. track rns

Use this command to configure a tracked object to track the operating status of an RNS object and enter the track mode.

Use the **no** form of this command is used to delete a tracked object.

track *object-number* rns *entry-number*

no track *object-number*

Parameter Description

Parameter	Description
<i>object-number</i>	Sets the tracked object number, in the range from 1 to 700.
<i>entry-number</i>	Sets the RNS object number, in the range from 1 to 500.

Defaults

N/A

Command Mode

Global configuration mode

Usage Guide

The RNS object status is determined by whether the response packets are received. If so, the RNS object status is up and the status of the corresponding tracked object that tracks this RNS is also up.

Examples

```
QTECH(config)# track 5 rns 7
```

Related Commands

Command	Description
track interface line-protocol	Tracks the status of one interface and enter the track mode.
show track [<i>track-number</i>]	Displays the tracked object related information.

Platform Description

N/A

8.28. track rns-list

Use this command to configure a tracked object to track the detection result of an RNS list instance. Use the **no** form of this command to delete a tracked object.

track *object-number* **rns-list** *men-list* { **and** | **or** }

no track *object-number*

Parameter Description

Parameter	Description
<i>object-number</i>	Indicates the number of the tracked object. The value ranges from 1 to 700.
<i>men-list</i>	Indicates the RNS list to be tracked. The value can be an RNS detection instance or a range of RNS detection instances. The instance range begins with a smaller RNS ID, ends with a larger RNS ID and is separated with an en dash (-), for example, 10–20. The value of an RNS ID ranges from 1 to 500.

Defaults

N/A

Command Mode

Global configuration mode

Default Level

1

Usage Guide

This command is used to configure a tracked object and specify the status of an RNS list based on a Boolean calculation.

- ❖ `track object-number rns-list men-list and`: Configures a tracked object to track the status of a tracked list with a Boolean expression using the "AND" operator.
- ❖ `track object-number rns-list men-list or`: Configures a tracked object to track the status of an RNS list with a Boolean expression using the "OR" operator.

Configuration Examples

The following example configures tracked object numbered 5 to track RNS instances numbered 1, 2–5, and 8.

```
QTECH(config)# track 5 rns-list 1,2-5,8and
```

Verification Run the **show track** command to display statistics of the tracked object.

Prompts

1. If resources on the device are insufficient when a tracked object is configured, an error will be displayed.

```
Failed to create track obj, no resource.
```

2. If the **no track** command is executed to delete a specified tracked object but this object does not exist on the device, an error will be displayed.

the track object does not exist.

Common Errors

A tracked object is configured to track an RNS list but the relevant RNS instance is not configured.

Platform Description

N/A

8.29. vrf

Parameter Description

Parameter	Description
<i>vrf-name</i>	Sets the VRF name.

Use this command to set the VRF where the IP RNS probe resides. Use the **no** form of this command to restore the default setting.

vrf *vrf-name*

no vrf

Defaults

N/A

Command Mode

IP RNS ICMP echo configuration mode IP RNS DNS configuration mode

IP RNS TCP configuration mode

Usage Guide

N/A

Configuration Examples

The following example sets the VRF where the IP RNS probe resides to VPN1.

```
QTECH(config)# ip rns 1
```

```
QTECH(config-ip-rns)# icmp-echo 192.168.23.1 QTECH(config-ip-rns-icmp-echo)#
```

```
vrf VPN1 QTECH(config-ip-rns-icmp-echo)# exit
QTECH(config)# ip rns schedule 1 start-time now life forever
```

Related Commands

Command	Description
<code>frequency</code> <i>milliseconds</i>	Sets the interval of sending the packets.

Platform Description

N/A