

# IP Address & Application Commands

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## 1. IP ADDRESS/SERVICE COMMANDS

### 1.1. gateway

Use this command to set the gateway address for the management port. Use the **no** form of this command to remove the setting.

**gateway** *address*

no gateway

#### Parameter Description

Parameter	Description
<i>address</i>	Sets the gateway address for the management port

#### Defaults

N/A

#### Command Mode

Interface configuration mode

#### Usage Guide

N/A

#### Configuration Examples

```
QTECH(config)# interface mgmt 0 QTECH(config-if-Mgmt
0)# gateway 1.1.1.1
QTECH(config-if-Mgmt 0)#
```

The following example sets the gateway address for the management port to 1.1.1.1.

#### Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A

## 1.2. ip-address

Use this command to configure the IP address of an interface. Use the **no** form of this command to restore the default setting.

**ip address** *ip-address network-mask* [ **secondary** ]

**no ip address** [ *ip-address network-mask* [ **secondary** ]

### Parameter Description

Parameter	Description
<i>ip-address</i>	32-bit IP address, with 8 bits in one group in decimal format. Groups are separated by dots.
<i>network-mask</i>	32-bit network mask. 1 stands for the mask bit, 0 stands for the host bit, with 8 bits in one group in decimal format. Groups are separated by dots.
<b>secondary</b>	Secondary IP address

### Defaults

No IP address is configured for the interface by default.

### Command Mode

Interface configuration mode

### Usage Guide

The equipment cannot receive and send IP packets before it is configured with an IP address. After an IP address is configured for the interface, the interface is allowed to run the Internet Protocol (IP).

The network mask is also a 32-bit value that identifies which bits among the IP address is the network portion. Among the network mask, the IP address bits that correspond to value "1" are the network address. The IP address bits that correspond to value "0" are the host address. For example, the network mask of Class A IP address is "255.0.0.0". You can divide a network into different subnets using the network mask. Subnet division means to use the bits in the host address part as the network address part, so as to reduce the capacity of a host and increase the number of networks. In this case, the network mask is called subnet mask.

The RGOS software supports multiple IP address for an interface, in which one is the primary IP address and others are the secondary IP addresses. Theoretically, there is no

limit for the number of secondary IP addresses. The primary IP address must be configured before the secondary IP addresses. The secondary IP address and the primary IP address must belong to the same network or different networks. Secondary IP addresses are often used in network construction. Typically, you can try to use secondary IP addresses in the following situations:

A network hasn't enough host addresses. At present, the LAN should be a class C network where 254 hosts can be configured. However, when there are more than 254 hosts in the LAN, another class C network address is necessary since one class C network is not enough. Therefore, the device should be connected to two networks and multiple IP addresses should be configured.

Many older networks are layer 2-based bridge networks that have not been divided into different subnets. Use of secondary IP addresses will make it very easy to upgrade this network to an IP layer-based routing network. The equipment configures an IP address for each subnet.

Two subnets of a network are separated by another network. You can create a subnet for the separated network, and connect the separated subnet by configuring a secondary IP address. One subnet cannot appear on two or more interfaces of a device.

### Configuration Examples

The following example configures the primary IP address and the network mask as 10.10.10.1 and 255.255.255.0 respectively .

```
QTECH(config)# interface gigabitEthernet 0/1
QTECH(config-if-GigabitEthernet 0/1)# ip address 10.10.10.1 255.255.255.0
```

### Related Commands

Command	Description
<b>show ip interface</b>	Displays detailed information of the interface.

### Platform Description

N/A

### 1.3. ip address-pool local

Use this command to enable the IP address pool function. Use the **no** form of this command to disable this function.

**ip address-pool local**

**no ip address-pool local**

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

This function is enabled by default.

## Command Mode

Global configuration mode

## Usage Guide

This function is enabled by default. PPP users can allocate an IP address to the peer end from the IP address pool configured. If you can use the **no ip address-pool local** command to disable this function and clear all configured IP address pools.

Configuration Examples

## Related Commands

## Platform Description

The following example enables the IP address pool function.

```
QTECH(config)# ip address-pool local
```

Command	Description
N/A	N/A

N/A

## 1.4. ip broadcast-addresss

Use this command to define a broadcast address for an interface in the interface configuration mode. Use the no form of this command to restore the default setting.

```
ip broadcast-addresss ip-address
```

```
no ip broadcast-addresss
```

## Parameter Description

Parameter	Description
<i>ip-address</i>	Broadcast address of IP network

## Defaults

The default IP broadcast address is 255.255.255.255.

## Command Mode

Interface configuration mode.

## Usage Guide

At present, the destination address of IP broadcast packet is all “1”, represented as 255.255.255.255. The RGOS software can generate broadcast packets with other IP addresses through definition, and can receive both all “1” and the broadcast packets defined by itself.

## Configuration Examples

The following example sets the destination address of IP broadcast packets generated by this interface to 0.0.0.0.

```
QTECH(config)# interface gigabitEthernet 0/1
QTECH(config-if)# ip broadcast-address 0.0.0.0
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 1.5. ip icmp error-interval

Use this command to set the rate to send the ICMP destination unreachable packets triggered by DF in the IP header. Use the no form of this command to restore the default setting.

```
ip icmp error-interval DF milliseconds [ bucket-size ]
```

```
no ip icmp error-interval DF milliseconds [ bucket-size ]
```

Use this command to set the rate to send other ICMP error packets. Use the no form of this command to restore the default setting.

```
ip icmp error-interval milliseconds [bucket-size]
```

```
no ip icmp error-interval milliseconds [ bucket-siz ]
```

## Parameter Description

Parameter	Description
<i>milliseconds</i>	The refresh period of the token bucket, in the range from 0 to 2147483647 in the unit of milliseconds. 0 indicates no limit on the rate to send ICMP error packets. The default is 100.
<i>bucket-size</i>	The number of tokens in the bucket, in the range is from 1 to 200. The default is 10.

### Defaults

The default rate is 10 packets per 100 millisecond.

### Command Mode

Global configuration mode.

### Usage Guide

To prevent DoS attack, the token bucket algorithm is adopted to limit the rate to send ICMP error packets.

If IP packets need to be fragmented while the DF is set to 1, the device sends ICMP destination unreachable packets numbered 4 to the source IP address for path MTU discovery. Rate limits on ICMP destination unreachable packets and other error packets are needed to prevent path MTU discovery failure.

It is recommended to set the refresh period to an integral multiple of 10 milliseconds. If the refresh period is not an integral multiple of 10 milliseconds, it is adjusted automatically. For example, 1 per 5 milliseconds is adjusted to 2 per 10 milliseconds; 3 per 15 milliseconds is adjusted to 2 per 10 milliseconds.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the rate to send the ICMP destination unreachable packets triggered by DF in the IP header to 100 per second.

```
QTECH(config)# ip icmp error-interval DF 1000 100
```

The following example sets the rate to send other ICMP error packets to 10 per second.

```
QTECH(config)# ip icmp error-interval 1000 10
```

Command	Description
N/A	N/A

N/A

## 1.6. ip icmp timestamp

Use this command to enable the device to return a Timestamp Reply. Use the no form of this command to disable returning of Timestamp Reply.

```
ip icmp timestamp no ip icmp timestamp
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Global configuration mode.

### Usage Guide

N/A

### Configuration Examples

### Related Commands

### Platform Description

The following example disables the device to return a Timestamp Reply.

```
QTECH(config)# no ip icmp timestamp
```

Command	Description
N/A	N/A

N/A

## 1.7. ip directed-broadcast

Use this command to enable the conversion from IP directed broadcast to physical broadcast in the interface configuration mode. Use the no form of this command to restore the default setting.

```
ip directed-broadcast [ access-list-number ]
```

```
no ip directed-broadcast
```

### Parameter Description

Parameter	Description
<i>access-list-number</i>	(Optional) Access list number, in the range from 1 to 199 and from 1300 to 2699. After an access list number has been defined, only the IP directed broadcast packets that match this access list are converted.

### Defaults

This function is disabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

IP directed broadcast packet is an IP packet whose destination address is an IP subnet broadcast address. For example, the packet with the destination address 172.16.16.255 is called a directed broadcast packet. However, the node that generates this packet is not a member of the destination subnet.

The device that is not directly connected to the destination subnet receives an IP directed broadcast packet and handles this packet in the same way as forwarding a unicast packet. After the directed broadcast packet reaches a device that is directly connected to this subnet, the device converts the directed broadcast packet into a flooding broadcast packet



(typically the broadcast packet whose destination IP address is all “1”), and then sends the packet to all the hosts in the destination subnet in the manner of link layer broadcast.

You can enable conversion from directed broadcast into physical broadcast on a specified interface, so that this interface can forward a direct broadcast packet to a directly connected network. This command affects only the final transmission of directed broadcast packets that

have reached the destination subnet instead of normal forwarding of other directed broadcast packets.

You can also define an access list on an interface to control which directed broadcast packets to forward. After an access list is defined, only the packets that conform to the conditions defined in the access list undergo conversion from directed broadcast into physical broadcast.

If the `no ip directed-broadcast` command is configured on an interface, RGOS will discard the directed broadcast packets received from the directly connected network.

### Configuration Examples

The following example enables forwarding of directed broadcast packet on the fastEthernet 0/1 port of a device.

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# ip directed-broadcast
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 1.8. ip local pool

Use this command to create an IP address pool. Use the `no` form of this command to remove the setting.

```
ip local pool pool-name low-ip-address [ high-ip-address ]
```

```
no ip local pool pool-name [ low-ip-address [ high-ip-address ] ]
```

## Parameter Description

Parameter	Description
<i>pool-name</i>	Specifies the address pool name. The default name is <b>default</b> .
<i>low-ip-address</i>	The start IP address in the address pool.
<i>high-ip-address</i>	(Optional) The end IP address in the address pool.

### Defaults

No IP address pool is configured by default.

### Command Mode

Global configuration mode

### Usage Guide

This command is used to create one or multiple IP address pools for PPP to allocate addresses to users.

### Configuration Examples

The following example creates an IP address pool named quark ranging from 172.16.23.0 to 172.16.23.255.

### Related Commands

### Platform Description

```
QTECH(config)#ip local pool quark 172.16.23.0 172.16.23.255
```

Command	Description
N/A	N/A

N/A

## 1.9. ip mask-reply

Use this command to configure the RGOS software to respond the ICMP mask request and send an ICMP response message in the interface configuration mode. Use the no form of this command to restore the default setting.

```
ip mask-reply no ip mask-reply
```

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

This function is disabled by default.

## Command mode

Interface configuration mode.

Usage Guide Sometimes, a network device needs the subnet mask of a subnet on the Internet. To obtain such information, the network device can send an ICMP mask request message, and the network device that receives this message will send a mask response message.

## Configuration Examples

The following example sets the FastEthernet 0/1 interface of a device to respond the ICMP mask request message.

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# ip mask-reply
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 1.10. ip mtu

Use this command to set the Maximum Transmission Unit (MTU) for an IP packet in the interface configuration mode. Use the **no** form of this command is restore the default setting.

**ip mtu** *bytes*

**no ip mtu**

## Parameter Description

Parameter	Description
<i>bytes</i>	Maximum transmission unit of IP packet , in the range from 68 to 1500 bytes

### Defaults

It is the same as the value configured in the interface command `mtu` by default.

### Command Mode

Interface configuration mode.

### Usage Guide

If an IP packet is larger than the IP MTU, the RGOS software will split this packet. All the devices in the same physical network segment must have the same IP MTU for the interconnected interface.

If the interface configuration command `mtu` is used to set the maximum transmission unit value of the interface, IP MTU will automatically match with the MTU value of the interface. However, if the IP MTU value is changed, the MTU value of the interface will remain unchanged.

### Configuration Examples

The following example sets the IP MTU value of the fastEthernet 0/1 interface to 512 bytes.

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# ip mtu 512
```

### Related Commands

Command	Description
<code>mtu</code>	Sets the MTU value of an interface.

### Platform Description

N/A

## 1.11. ip redirects

Use this command to allow the RGOS software to send an ICMP redirection message in the interface configuration mode. Use the **no** form of this command to disable this function.

ip redirects

**no ip redirects**

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

When the route is not optimum, it may make the device to receive packets through one interface and send it though the same interface. If the device sends the packet through the interface through which this packet is received, the device will send an ICMP redirection message to the data source, telling the data source that the gateway for the destination address is another device in the subnet. In this way the data source will send subsequent packets along the optimum path.

### Configuration Examples

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# no ip redirects
```

The following example disables ICMP redirection for the fastEthernet 0/1 interface.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 1.12. ip source-route

Use this command to allow the RGOS software to process an IP packet with source route information in global configuration mode. Use the no form of this command to disable this function.

```
ip source-route no ip source-route
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Global configuration mode.

Usage Guide RGOS supports IP source route. When the device receives an IP packet, it will check the options of the IP packet, such as strict source route, loose source route and record route. Details about these options can be found in RFC 791. If an option is found to be enabled in this packet, a response will be made. If an invalid option is detected, an ICMP parameter problem message will be sent to the data source, and then this packet is discarded.

### Configuration Examples

#### Related Commands

Command	Description
N/A	N/A

The following example disables the IP source route.

```
QTECH(config)# no ip source-route
```

### Platform Description

N/A

## 1.13. ip ttl

### Parameter Description

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

<i>value</i>	Sets the TTL value of the unicast packet, in the range from 0 to 255.
--------------	-----------------------------------------------------------------------

Use this command to set the TTL value of the unicast packet. Use the **no** form of this command to restore the default setting.

**ip ttl** *value*

no ip ttl

### Defaults

The default is 64.

### Command Mode

Global configuration mode

### Usage Guide

N/A

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the TTL value of the unicast packet to 100.

```
QTECH(config)# ip ttl 100
```

Command	Description
N/A	N/A

N/A

## 1.14. ip ttl-expires enable

This command is used to enable notifications of expired TTL. Use the **no** form of this command to disable this function.

ip ttl-expires enable no ttl-expires enable

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

By default, notifications are enabled to indicate expired TTL.

### Command mode

Global configuration mode

### Usage Guide

N/A

### Configuration Examples

The following example disables notifications indicating expired TTL.

```
QTECH(config)# no ttl-expires enable
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 1.15. ip unnumbered

This command is used to configure unnumbered interfaces. After an interface is set to an unnumbered interface, IP can be run on the interface and packets can be sent or received on the interface. Use the no form of this command to restore the default setting.

```
ip unnumbered interface-type interface-number
```

```
no ip unnumbered
```

### Parameter Description

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



<i>interface-type</i>	Type of the associated interface
<i>interface-number</i>	No. of the associated interface

### Defaults

No unnumbered interface is configured by default.

### Command mode

Interface configuration mode

### Usage Guide

An unnumbered interface indicates that IP is enabled on the interface but no IP address is allocated for the interface. An unnumbered interface must associate with an interface with an IP address. The source IP address of the IP packets generated on an unnumbered interface is the IP address of the associated interface. In addition, the routing protocol process determines whether to send route update packets to the unnumbered interface according to the IP address of the associated interface. Pay attention to the following when using an unnumbered interface:

An Ethernet interface cannot be set to an unnumbered interface.

When SLIP, HDLC, PPP, LAPB, and Frame-relay are encapsulated on a serial port, the port can be set to an unnumbered interface. When a frame relay is encapsulated, only a point-to-point subinterface can be set to an unnumbered interface. In the case of X.25 encapsulation, unnumbered interface is not allowed.

The ping command cannot be used to check whether an unnumbered interface is working properly because the interface does not have an IP address. The status of an unnumbered interface can be remotely monitored over SNMP.

The network cannot be enabled using an unnumbered interface.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example configures the local interface as an unnumbered interface and sets the associated interface to FastEthernet 0/1 (an IP address is configured for the interface).

```
QTECH(config-if)# ip unnumbered fastEthernet 0/1
```

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

show interface	Displays the detailed information about the interface.
----------------	--------------------------------------------------------

N/A

## 1.16. ip unreachable

Use this command to allow the RGOS software to generate ICMP destination unreachable messages. Use the no form of this command to disable this function.

ip unreachable

no ip unreachable

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

RGOS software will send a ICMP destination unreachable message if it receives unicast message with self-destination-address and can not process the upper protocol of this message.

RGOS software will send ICMP host unreachable message to source data if it can not forward a message due to no routing.

This command influences all ICMP destination unreachable messages.

### Configuration Examples

The following example disables sending ICMP destination unreachable message on FastEthernet 0/1.

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# no ip unreachable
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 1.17. show ip interface

Use this command to display the IP status information of an interface.

show ip interface [ *interface-type interface-number* | brief ]

### Parameter Description

Parameter	Description
<i>interface-type</i>	Specifies interface type.
<i>interface-number</i>	Specifies interface number.
<i>brief</i>	Displays the brief configurations about the IP of the layer-3 interface (including the interface primary ip, secondary ip and interface status)

### Defaults

N/A.

### Command Mode

## 1.18. rivileged EXEC mode.

**Usage Guide** When an interface is available, RGOS will create a direct route in the routing table. The interface is available in that the RGOS software can receive and send packets through this interface. If the interface changes from available status to unavailable status, the RGOS software removes the appropriate direct route from the routing table.

If the interface is unavailable, for example, two-way communication is allowed, the line protocol status will be shown as “UP”. If only the physical line is available, the interface status will be shown as “UP”.

The results shown may vary with the interface type, because some contents are the interface-specific options

## Configuration Examples

The following example displays the output of the **show ip interface brief** command.

```
QTECH#show ip interface brief
Interface IP-Address(Pri) IP-Address(Sec) Status Protocol GigabitEthernet 0/10
2.2.2.2/24 3.3.3.3/24 down down
GigabitEthernet 0/11 no address no address down down
VLAN 1 1.1.1.1/24 no address down down
```

### Description of fields:

Field	Description
Status	Link status of an interface. The value can be <b>up</b> , <b>down</b> , or <b>administratively down</b> .
Protocol	IPv4 protocol status of an interface.

The following example displays the output of the **show ip interface vlan** command.

```
SwitchA#show ip interface vlan 1 VLAN 1
IP interface state is: DOWN
IP interface type is: BROADCAST IP interface
MTU is: 1500
IP address is: 1.1.1.1/24 (primary)
IP address negotiate is: OFF Forward direct-
broadcast is: OFF ICMP mask reply is: ON
Send ICMP redirect is: ON Send ICMP
unreachabled is: ON DHCP relay is: OFF
Fast switch is: ON Help address
is:
Proxy ARP is: OFF
ARP packet input number: 0 Request
packet: 0
Reply packet: 0
Unknown packet: 0
TTL invalid packet number: 0 ICMP packet
input number: 0 Echo request: 0
Echo reply: 0
Unreachable: 0
```

```
Source quench: 0
Routing redirect: 0
```

## Description of fields in the results:

Field	Description
IP interface state is:	The network interface is available, and both its interface hardware status and line protocol status are "UP".
IP interface type is:	Show the interface type, such as broadcast, point-to-point, etc.
IP interface MTU is:	Show the MTU value of the interface.
IP address is:	Show the IP address and mask of the interface.
IP address negotiate is:	Show whether the IP address is obtained through negotiation.
Forward direct-broadcast is:	Show whether the directed broadcast is forwarded.
ICMP mask reply is:	Show whether an ICMP mask response message is sent.
Send ICMP redirect is:	Show whether an ICMP redirection message is sent.
Send ICMP unreachable is:	Show whether an ICMP unreachable message is sent.
DHCP relay is:	Show whether the DHCP relay is enabled.
Fast switch is:	Show whether the IP fast switching function is enabled.
Route horizontal-split is:	Show whether horizontal split is enabled, which will affect the route update behavior of the distance vector protocol.
Help address is:	Show the helper IP address.

Proxy ARP is:	Show whether the agent ARP is enabled.
ARP packet input number: Request packet: Reply packet: Unknown packet:	Show the total number of ARP packets received on the interface, including: ARP request packet ARP reply packet Unknown packet
TTL invalid packet number:	Show the TTL invalid packet number
ICMP packet input number: Echo request: Echo reply: Unreachable: Source quench: Routing redirect:	Show the total number of ICMP packets received on the interface, including: Echo request packet Echo reply packet Unreachable packet Source quench packet Routing redirection packet
Outgoing access list is	Show whether an outgoing access list has been configured for an interface.
Inbound access list is	Show whether an incoming access list has been configured for an interface.

### Related Commands

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

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

## Platform Description

N/A.

## 1.19. show ip packet queue

Use this command to display the statistics of IP packet queues.

show ip packet queue

## Parameter Description

Parameter	Description
N/A.	N/A.

## Defaults

N/A

## Command Mode

Privileged EXEC mode.

## Usage Guide

N/A.

## Configuration Examples

## Related Commands

Command	Description
N/A	N/A

The following example displays the statistics of IP packet queues.

```
ECH#show ip packet queue Receive 31925 packets(fragment=0):
IP packet receive queue: length 0, max 1542, overflow 0. Receive 13 ICMP echo packets, 25
ICMP reply packets .
Discards:
Failed to alloc skb: 0. Receive queue overflow: 0. Unknow protocol drops: 0.
ICMP rcv drops: 0. for skb check fail. ICMP rcv drops: 0. for skb is broadcast.
```

Sent packets:

Success: 15644

Generate 13 and send 8 ICMP reply packets, send 26 ICMP echo packets. It records 187 us as max time in ICMP reply process.

Failed to alloc ebuf: 0 Dropped by EFMP: 0 NoRoutes: 887

Get vrf fails: 0

Cannot assigned address drops: 0 Failed to encapsulate ethernet head: 0

ICMP error queue: length 0, max 1542, overflow 0.

Field	Description
IP packet receive queue	Statistics of received packets
Discards	Statistics of discarded packets
Sent packets	Statistics of sent packets
ICMP error queue	Statistics of ICMP error packets

## Platform Description

N/A

## 1.20. show ip packet statistics

Use this command to display the statistics of IP packets.

**show ip packet statistics** [ **total** | *interface-name* ]

### Parameter Description

Parameter	Description
<i>interface-name</i>	Interface name
<i>total</i>	Displays the total statistics of all interfaces.

### Defaults

N/A.

### Command Mode

Privileged EXEC mode.

### Usage Guide

N/A.



## Configuration Examples

The following example displays the output of this command.

```
QTECH# show ip packet statistics Total
Received      1000      packets,      1000000      bytes
Unicast:1000,Multicast:0,Broadcast:0 Discards:0
HdrErrors:0 (BadChecksum:0,TTLExceeded:0,Others:0) NoRoutes:0
Others:0
Sent 100 packets, 6000 bytes
Unicast:50,Multicast:50,Broadcast:0

VLAN 1
Received      1000      packets,      1000000      bytes
Unicast:1000,Multicast:0,Broadcast:0 Discards:0
HdrErrors:0 (BadChecksum:0,TTLExceeded:0,Others:0) NoRoutes:0
Others:0
Sent 100 packets, 6000 bytes
Unicast:50,Multicast:50,Broadcast:0
```

## Related Commands

Command	Description
<b>ip default-gateway</b>	Configures the default gateway, which is only supported on the Layer 2 switch.

## Platform Description

N/A

## 1.21. show ip pool

Use this command to display the IP address pool.

```
show ip pool [ pool-name ]
```

## Parameter Description

Parameter	Description
<i>pool-name</i>	Specifies the IP address pool.

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

N/A

**Configuration Examp****Related Commands****Platform Description**

The following example displays all IP address ranges.

```
QTECH# show ip pool
QTECH(config)#show ip pool
Pool   Begin
default      1.1.1.1
pool1       2.2.2.2
pool2       3.1.1.1
pool3       192.168.1.1
```

Field	Description
Pool	Address pool name
Begin	The start IP address of the address pool
Free	The number of free IP addresses in the address pool
In use	The number of IP addresses in use in the address pool

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

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

N/A

## 1.22. show ip raw-socket

Use this command to display IPv4 raw sockets.

show ip raw-socket [ *num* ]

### Parameter Description

Parameter	Description
<i>num</i>	Protocol.

### Defaults

N/A.

### Command Mode

Privileged EXEC mode.

### Usage Guide

N/A.

### Configuration Examples

The following example displays all IPv4 raw sockets.

```
QTECH# show ip raw-socket Number Protocol
Process name
1      ICMP    dhcp.elf
2      ICMP    vrrp.elf
3      IGMP    igmp.elf
4      VRRP    vrrp.elf Total: 4
```

### Related Commands

### Platform Description

### Field Description

Field	Description
Number	Number
Protocol	Protocol
Process name	Process name
Total	Total number

Command	Description
N/A	N/A

N/A

### 1.23. show ip sockets

Use this command to display all IPv4 sockets.

show ip sockets

#### Parameter Description

Parameter	Description
N/A.	N/A.

#### Defaults

N/A.

Command Mode	Privileged EXEC mode.
Usage Guide	N/A.
Configuration	The following displays all IPv4 sockets.
Examples	<pre> QTECH# show ip sockets Number Process name Type Protocol LocalIP:Port ForeignIP:Port </pre>

```
State
1      dhcp.elf      RAW      ICMP     0.0.0.0:1      0.0.0.0:0
*
2      vrrp.elf      RAW      ICMP     0.0.0.0:1      0.0.0.0:0
*
3      igmp.elf      RAW      IGMP     0.0.0.0:2      0.0.0.0:0
*
4      vrrp.elf      RAW      VRRP     0.0.0.0:112    0.0.0.0:0
*
5      dhcpc.elf     DGRAM   UDP      0.0.0.0:68     0.0.0.0:0
*
6      rg-snmpd     DGRAM   UDP      0.0.0.0:161    0.0.0.0:0
*
7      wbav2 DGRAM           UDP      0.0.0.0:2000   0.0.0.0:0
*
8      vrrp_plus.elfDGRAM       UDP      0.0.0.0:3333   0.0.0.0:0
*
9      mpls.elf     DGRAM   UDP      0.0.0.0:3503   0.0.0.0:0
*
10     rds_other_th DGRAM   UDP      0.0.0.0:3799   0.0.0.0:0
*
11     rg-snmpd     DGRAM   UDP      0.0.0.0:14800  0.0.0.0:0
*
12     rg-sshd     STREAM  TCP      0.0.0.0:22     0.0.0.0:0
LISTEN
13     rg-telnetd  STREAM  TCP      0.0.0.0:23     0.0.0.0:0
LISTEN
14     wbard  STREAM  TCP      0.0.0.0:4389   0.0.0.0:0
```

```

LISTEN
15      wbard  STREAM          TCP          0.0.0.0:7165  0.0.0.0:0
LISTEN
Total: 15

```

### Field Description

Field	Description
Number	Serial number.
Process name	Process name.
Type	Socket type, including the following types: RAW: raw sockets DGRAM: datagram type STREAM: stream type.
Protocol	Protocol.
LocalIP:Port	Local IP address and port.
ForeignIP:Port	Peer IP address and port.
State	State. This field is for only TCP sockets.
Total	The total number of sockets.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 1.24. show ip udp

Use this command to display IPv4 UDP sockets.

## 1. IP Address/Service Commands

```
show ip udp [ local-port num ]
```

Use this command to display IPv4 UDP socket statistics.

```
show ip udp statistics
```

### Parameter Description

Parameter	Description
<b>local-port num</b>	Local port number

### Defaults

N/A.

### Privileged EXEC mode.

### Usage Guide

N/A.

### Configuration Examples

The following example displays all IPv4 UDP sockets.

```
QTECH# show ip udp Number
Local Address 1 0.0.0.0:68      Peer Address 0.0.0.0:0      Process name dhcpc.elf
2      0.0.0.0:161                0.0.0.0:0                    rg-snmpd          wbav2
3      0.0.0.0:2000              0.0.0.0:0                    vrrp_plus.elf    mpl.s.elf
4      0.0.0.0:3333              0.0.0.0:0                    rds_other_th
5      0.0.0.0:3503              0.0.0.0:0                    rg-snmpd
6      0.0.0.0:3799              0.0.0.0:0
7      0.0.0.0:14800            0.0.0.0:0
```

### Related Commands

### Platform Description

Field Description

Field	Description
Number	Number.

Local Address	Local IP address and port.
Peer Address	Peer IP address and port.
Process name	Process name.

Command	Description
N/A	N/A

N/A



## 2. ARP COMMANDS

### 2.1. arp

Use this command to add a permanent IP address and MAC address mapping to the ARP cache table. Use the **no** form of this command to restore the default setting.

**arp** [ *vrf name* ] *ip-address* *MAC-address* *type*

**no arp** [ *vrf name* ] *ip-address*

#### Parameter Description

Parameter	Description
<i>vrf name</i>	VRF instance. Set the <i>name</i> parameter to configure a name for the VRF instance. By default, no VRF instance is specified. The configured static ARP is global.
<i>ip-address</i>	The IP address that corresponds to the MAC address. It includes four parts of numeric values in decimal format separated by dots.
<i>MAC-address</i>	48-bit data link layer address
<i>type</i>	ARP encapsulation type. The keyword is <i>arpa</i> for the Ethernet interface.

#### Defaults

There is no static mapping record in the ARP cache table by default.

#### Command Mode

Global configuration mode.

#### Usage Guide

RGOS finds the 48-bit MAC address according to the 32-bit IP address using the ARP cache table. Since most hosts support dynamic ARP resolution, usually static ARP mapping is not necessary. The **clear arp-cache** command can be used to delete the ARP mapping that is learned dynamically.

#### Configuration Examples

#### Related Commands

## Platform Description

The following example sets an ARP static mapping record for a host in the Ethernet.

```
QTECH(config)# arp 1.1.1.1 4e54.3800.0002 arpa
```

Command	Description
clear arp-cache	Clears the ARP cache table

N/A

## 2.2. arp-learning

Use this command to enable ARP learning. Use the **no** form of this command to disable this

### Parameter Description

function.

arp-learning enable no arp-learning enable

### Defaults

This function is enabled by default

Parameter	Description
N/A	N/A

### Command Mode

Interface configuration mode

**Usage Guide** After the device learns the dynamic ARP and turns it to the static ARP through Web, it is recommended to enable ARP learning. Otherwise, it is not recommended to enable this function. If this function is disabled with dynamic ARP existing, you can turn dynamic ARP to static ARP through Web. You can also clear the dynamic ARP using the clear arp command to deny the specified user's access to Internet. Otherwise, the dynamic ARP will be aged and then cleared. After this function is disabled, the AnyIP function and trust ARP detection are disabled.

### Configuration Examples

The following example enables ARP learning.

```
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# arp-learning enable
```

```
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# no arp-learning enable
```

The following example disables ARP learning.

### Related Commands

Command	Description
N/A	N/A

N/A

## 2.3. arp anti-ip-attack

Use this command to configure ARP anti-ip-attack. Use the **no** form of this command to restore the default setting.

arp anti-ip-attack *num*

**no arp anti-ip-attack**

### Parameter Description

Parameter	Description
<i>num</i>	The number of the IP message to trigger the ARP to discarded entry in the range from 0 to 100. 0 stands for disabling the arp anti-ip-attack function.

### Defaults

By default, set the discarded entry after 3 unknown unicast messages are sent to the CPU.

### Command Mode

Global configuration mode.

**Usage Guide** For the messages corresponds to the directly-connected route, if the switch does not learn the ARP that corresponds to the destination IP address, it is not able to forward the message in hardware, and it needs to send the message to the CPU to resolve the address(that is the ARP learning). Sending large number of this message to the CPU will influence the other tasks of the switch. To prevent the IP messages from attacking the CPU, a discarded entry is set to the hardware during the address resolution, so that all sequential messages with that destination IP address are not sent to the CPU. After the address resolution, the entry is updated to the forwarding status, so that the switch could forward the message with that destination IP address in hardware.

In general, during the ARP request, if the switch CPU receives three destination IP address messages corresponding to the ARP entry, it is considered to be possible to attack the CPU and the switch sets the discarded entry to prevent the unknown unicast message from attacking the CPU. User could set the *num* parameter of this command to decide whether it attacks the CPU in specific network environment or disable this function.

The arp anti-ip-attack function needs to occupy the switch hardware routing resources when attacked by the unknown unicast message. If there are enough resources, the arp anti-ip-attack *num* could be smaller. If not, in order to preferential ensure the use of the normal routing, the *num* could be larger or disable this function.

## Configuration Examples

### Related Commands

### Platform Description

The following example sets the IP message number that triggers to discard entry as 5.

```
QTECH(config)# arp anti-ip-attack 5
```

The following example disables the ARP anti-ip-attack function.

```
QTECH(config)# arp anti-ip-attack 0
```

Command	Description
N/A	N/A

N/A

## 2.4. arp cache interface-limit

Use this command to set the maximum number of ARP learned on the interface. Use the no form of this command to restore the default setting.

```
arp cache interface-limit limit
```

```
no arp cache interface-limit
```

### Parameter

Parameter	Description
<b>limit</b>	<b>Sets the maximum number of ARP learned on the interface, including static and dynamic ARPs, in the range from 0 to the number supported on the interface. 0 indicates that the number is</b>

	<b>not limited.</b>
--	---------------------

### Description

### Defaults

The default is 0.

### Command Mode

Interface configuration mode

### Usage Guide

This function can prevent ARP attacks from generating ARP entries to consume memory. *limit* must be no smaller than the number of ARPs learned on the interface. Otherwise, the configuration does not take effect.

### Configuration Examples

```
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# arp cache interface-limit 300
```

The following example sets the maximum number of ARP learned on the interface to 300.

The following example restores the default setting.

```
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# no arp cache interface-limit
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 2.5. arp gratuitous-send interval

Use this command to set the interval of sending the free ARP request message on the interface. Use the no form of this command to restore the default setting.

arp gratuitous-send interval *seconds*

no arp gratuitous-send

### Parameter Description

Parameter	Description
<i>seconds</i>	The time interval to send the free ARP request message in the range from 1 to 3600 in the unit of seconds.
<i>number</i>	The number of free ARP request message to be sent in the range from 1 to 100. The default value is 1.

### Defaults

This function is disabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

If an interface of the switch is used as the gateway of its downlink devices and counterfeit gateway behavior occurs in the downlink devices, you can configure to send the free ARP request message regularly on this interface to notify that the switch is the real gateway.

### Configuration Examples

The following example sets to send one free ARP request to SVI 1 per second.

```
QTECH(config)# interface vlan 1
QTECH(config-if)# arp gratuitous-send interval 1
```

```
QTECH(config)# interface vlan 1
QTECH(config-if)# no arp gratuitous-send
```

The following example stops sending the free ARP request to SVI 1.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A



## 2.6. arp oob

Use this command to configure the static ARP on the management interface. Use the no form of this command to restore the default setting.

```
arp oob [ mgmt.-name ] ip-address mac-address type
```

```
no arp oob [ mgmt.-name ] ip-address
```

### Parameter Description

Parameter	Description
<i>ip-address</i>	The IP address corresponding to the MAC address, written as four groups of dotted decimal values.
<i>mac-address</i>	The data link layer address, composed of 48 bits.
<i>type</i>	The ARP encapsulation type. The key word for the Ethernet interface is <b>arpa</b> .
<i>mgmt.-name</i>	Specifies the ARP-mapping management interface when there are multiple management interfaces.

### Defaults

No static ARP is configured by default.

### Command Mode

Global configuration mode

### Usage Guide

RGOS uses the ARP cache table to search for the 48-bit MAC address according to the 32-bit IP address.

ost hosts support dynamic ARP analysis, so static ARP mapping does not need to be configured. The clear arp-cache oob command is used to clear the ARP mapping learned by the management port dynamically.

If no management interface is specified, the static ARP is configured on the first management interface by default. If you specify the first management interface, the *mgmt-name* parameter is not displayed by running the **show run** command.

### Configuration Examples

## Related Commands

### Platform Description

The following example configures a static ARP mapping record for the Ethernet host

```
QTECH(config)# arp oob 1.1.1.1 4e54.3800.0002 arpa
```

Command	Description
N/A	N/A

N/A

## 2.7. arp proxy-resolved

Use this command to enable a device to judge the existence of the ARP entry corresponding to a destination IP address when the device responds to an ARP request as an ARP proxy. Use the no form of this command to disable this function.

```
arp proxy-resolved no arp proxy-resolved
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Global configuration mode

**Usage Guide** After the arp proxy-resolved command is configured, the active VRRP device first judges, upon receiving an ARP request, whether the ARP entry corresponding to the destination IP address exists. If yes, the active VRRP device acts as an ARP proxy. If no, the active VRRP device does not act as an ARP proxy. In addition, the gateway automatically requests the ARP entry corresponding to the destination IP address in broadcast mode. This prevents a case that the gateway fails to act as a proxy to respond to an ARP request of the destination IP address due to absence of the ARP entry corresponding to the destination IP address.



After the `no arp proxy-resolved` command is configured, if the proxy conditions are met, the active VRRP device directly acts as a proxy upon receiving an ARP request, with no need to judge whether the ARP entry corresponding to the destination IP address has been resolved.

## Configuration Examples

### Related Commands

### Platform Description

The following example disables a device to judge the existence of the ARP entry corresponding to a destination IP address when the device responds to an ARP request as an ARP proxy.

```
QTECH(config)# no arp proxy-resolved
```

Command	Description
N/A	N/A

N/A

## 2.8. arp resolve vlan

Use this command to enable active sending of ARP resolution requests to a specific sub VLAN of a super VLAN. Use the `no` form of this command to disable the active sending of ARP resolution requests to a specific sub VLAN of a super VLAN. Use the default form of this command to restore the default settings. `arp resolve vlan {vlan-list | none}`

`no arp resolve vlan {vlan-list | none} default arp resolve vlan`

### Parameter Description

Parameter	Description
<i>vlan-list</i>	Sets the list of sub VLANs in a super VLAN, where ARP resolution requests are sent only to these sub VLANs.
<b>none</b>	Specifies that no ARP resolution request is sent to any sub VLAN of a super VLAN.

### Defaults

This function is disabled by default.

### Command Mode

## Global configuration mode

**Usage Guide** By default, the device actively sends ARP resolution requests to the entire super VLAN by default. If many sub VLANs exist in a super VLAN, then a great number of packet replications are caused and therefore affect device performance.

Most terminals (such as PCs and servers) request ARP information from the gateway before accessing the network. Therefore, it is unnecessary to actively broadcast ARP resolution requests to the sub VLANs where these terminals reside. For dumb terminals that do not actively send free ARP requests, run the `arp resolve vlan vlan-list` command to actively send ARP resolution requests to VLANs in the specified VLAN list.

After the `arp resolve vlan vlan-list` command is configured, ARP resolution requests are sent only to VLANs specified in the VLAN list. It should be particularly noted that if authentication-free VLANs are not included in the VLAN list specified in the `arp resolve vlan` command, ARP resolution requests are not broadcast to the authentication-free VLANs.

### Configuration Examples

The following example enables active sending of ARP resolution requests from the device to VLANs 10–20 and VLANs 25–30.

```
QTECH(config)# arp resolve vlan 10-20, 25-30
```

The following example disables active sending of ARP resolution requests from the device to VLANs 10–20.

```
QTECH(config)# no arp resolve vlan 10-20
```

The following example configures the device not to actively send ARP resolution requests to any sub VLAN of a super VLAN.

```
QTECH(config)# arp resolve vlan none
```

**Verification** Run the `show running-config` command to display configurations.

## 2.9. arp retry interval

Use this command to set the frequency for sending the arp request message locally, namely, the time interval between two continuous ARP requests sent for resolving one IP address. Use the `no` form of this command to restore the default setting.

```
arp retry interval seconds
```

```
no arp retry interval
```

### Parameter Description

Parameter	Description
<i>seconds</i>	Time for retransmitting the ARP request message in the range from 1 to 3600 in the unit of seconds.

### Defaults

### Command Mode

Global configuration mode.

### Usage Guide

The switch sends the ARP request message frequently, and thus causing problems like network busy. In this case, you can set the retry interval of the ARP request message longer. In general, it should not exceed the aging time of the dynamic ARP entry.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the retry interval of the ARP request as 30 seconds.

```
QTECH(config)# arp retry interval 30
```

Command	Description
arp retry times	Number of times for retransmitting an ARP request message.

N/A

### 2.10. arp retry times

Use this command to set the local retry times of the ARP request message, namely, the times of sending the ARP request message to resolve one IP address. Use the no form of this command to restore the default setting.

arp retry times *number*

no arp retry times

#### Parameter Description

Parameter	Description
<i>number</i>	The times of sending the same ARP request in the range from 1 to 100. When it is set as 1, it indicates that the ARP request is not retransmitted, only 1 ARP request

	message is sent.
--	------------------

### Defaults

The default is 5.

### Command Mode

Global configuration mode.

**Usage Guide** The switch sends the ARP request message frequently, and thus causing problems like network busy. In this case, you can set the retry times of the ARP request smaller. In general, the retry times should not be set too large.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the local ARP request not to be retried.

```
QTECH(config)# arp retry times 1
```

The following example sets the local ARP request to be retried for one time.

```
QTECH(config)# arp retry times 2
```

Command	Description
arp retry interval	Interval for retransmitting an ARP request message

N/A

## 2.11. arp suppress-auth-vlan-req

Use this command to disable the SVI interface from sending the ARP request to the authentication VLAN. Use the no form of this command to disable this function.

```
arp suppress-auth-vlan-req no arp suppress-auth-vlan-req
```



### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Interface configuration mode

**Usage Guide** In gateway authentication mode, all sub-VLANs of SuperVLAN are authentication VLANs by default. Users on authentication VLANs should pass the authentication before accessing the network. Static ARP table entries are generated on the device after users pass authentication. The device does not need to send ARP requests to the authentication VLAN when accessing these users. If the device accesses users on the authentication-exemption VLAN, it only needs to send ARP requests to the authentication-exemption VLAN.

In gateway authentication mode, the device enables suppression of ARP request sent to the authentication VLAN by default. If the device needs to access authentication-exemption users on the authentication VLAN, this function should be disabled.

### Configuration Examples

The following example disables VLAN 2 from sending the ARP request to the authentication VLAN.

```
QTECH(config)# interface vlan 2
QTECH(config-if-VLAN 2)# arp suppress-auth-vlan-req
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 2.12. arp switch-over resolve

Use this command to enable active ARP resolution during active/standby switchovers in global configuration mode. Use the **no** form of this command to disable active ARP resolution during active/standby switchovers.

arp switch-over resolve

no arp switch-over resolve

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

Active ARP resolution during active/standby switchovers is disabled by default.

### Command Mode

Global configuration mode

Default Level2

### Usage Guide

This command is used to quickly update ARP entries of the downlink device during VSU active/standby switchovers (especially when the downlink device is similar to a server with two NICs). When the standby host takes over the responsibilities of the active host, the new active host actively sends ARP resolution requests to a maximum of 1,000 terminals on a common SVI (not an interface in a super VLAN), to trigger the terminals to respond with ARP entries, thereby updating the ARP and MAC tables.

### Configuration Examples

The following example enables active ARP resolution during active/standby switchovers.

```
QTECH(config)# arp switch-over resolve
```

### Verification

Run the **show running-config** command to display configurations.

## 2.13. arp timeout

Use this command to configure the timeout for the ARP static mapping record in the ARP cache. Use the **no** form of this command to restore the default setting.

arp timeout *seconds*

no arp timeout

## Parameter Description

Parameter	Description
<i>secondsv</i>	The timeout is in the range from 0 to 2147483 in the unit of seconds.

## Defaults

The default is 3600.

## Command Mode

Interface configuration mode/Global configuration mode

## Usage Guide

The ARP timeout setting is only applicable to the IP address and the MAC address mapping that are learned dynamically. The shorter the timeout, the truer the mapping table saved in the ARP cache, but the more network bandwidth occupied by the ARP. Hence the advantages and disadvantages should be weighted. Generally it is not necessary to configure the ARP timeout unless there is a special requirement.

The ARP timeout configuration in interface configuration mode prevail over that in global configuration mode.

## Configuration Examples

The following example sets the timeout for the dynamic ARP mapping record that is learned dynamically from FastEthernet port 0/1 to 120 seconds.

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if-GigabitEthernet 0/1)# arp timeout 120
```

The following example sets the ARP timeout to 3000 seconds in global configuration mode.

```
QTECH(config)# arp timeout 3000
```

## Related Commands

Command	Description
<b>clear arp-cache</b>	Clears the ARP cache list.
<b>show interface</b>	Displays the interface information.

## Platform Description

N/A

## 2.14. arp trusted

Use this command to set the maximum number of trusted ARP entries. Use the **no** form of this command to restore the default setting.

**arp trusted** *number*

no arp trusted

### Parameter Description

Parameter	Description
<i>number</i>	Maximum number of trusted ARP entries. It ranges from 10 to the maximum ARP volum minus 1,024.

Defaults

N/A

### Command Mode

Global configuration mode.

### Usage Guide

To make this command valid, enable the trusted ARP function firstly. The trusted ARP entries and other entries share the memory. Too much trusted ARP entries may lead to insufficient ARP entry space. In general, you should set the maximum number of trusted ARP entries according to your real requirements.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets 1000 trusted ARPs.

```
QTECH(config)# arp trusted 1000
```

Command	Description
<b>service trustedarp</b>	Enables the trusted ARP function.

N/A



## 2.15. arp trust-monitor enable

Use this command to enable egress gateway trusted ARP. Use the no form of this command to restore the default setting.

arp trust-monitor enable no arp trust-monitor enable

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is disabled by default.

### Command Mode

Interface configuration mode

**Usage Guide** The egress gateway trusted ARP is different from GSN trusted ARP. With this function enabled, the device sends a unicast request for confirmation when learning an ARP table entry. The device learns the ARP table entry after receiving the response. When the device receives the ARP packet, only if the ARP table entry is aged or incomplete and the ARP packet is a response packet will the packet be handled. After egress gateway trusted ARP is enabled, the aging time of the ARP table entry turns to 60 seconds. After this function is disabled, the aging time restores to 3600 seconds.

### Configuration Examples

The following example enables egress gateway trusted ARP.

```
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# arp trust-monitor enable
QTECH(config)# interface gi 0/0
QTECH(config-if-GigabitEthernet 0/0)# no arp trust-monitor enable
```

The following example disables egress gateway trusted ARP.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 2.16. arp trusted aging

Use this command to set trusted ARP aging. Use the no form of this command to restore the default setting.

arp trusted aging no arp trusted aging

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is disabled by default.

### Command Mode

Global configuration mode.

### Usage Guide

Use this command to set trusted ARP aging. Aging time is the same as dynamic ARP aging time.

Use the arp timeout command to set aging time in interface mode.

### Configuration Examples

### Related Commands

### Platform Description

The following example enables trusted ARP aging.

```
QTECH(config)# arp trusted aging
```

Command	Description
service trustedarp	Enables trusted ARP function.

## 2.17. arp trusted user-vlan

Use this command to execute the VLAN transformation while setting the trusted ARP entries. Use the

no form of this command to restore the default setting.

```
arp trusted user-vlan vid1 translated-vlan vid2
```

```
no arp trusted user-vlan vid1
```

### Parameter Description

Parameter	Description
vid1	VID set by the server.
vid2	VID after the transformation.

### Defaults

This function is disabled by default.

### Command Mode

Global configuration mode.

### Usage Guide

In order to validate this command, enable the trusted ARP function first. This command is needed only when the VLAN sent by the server is different from the VLAN which takes effect in the trusted ARP entry.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the VLAN sent by the server to 3, but the VLAN which takes effect in the trusted ARP entry to 5.

```
QTECH(config)# arp trusted user-vlan 3 translated-vlan 5
```

Command	Description
service trustedarp	Enables the trusted ARP function.

N/A

## 2.18. arp unresolve

Use this command to set the maximum number of the unresolved ARP entries. Use no form of this command to restore the default setting.

arp unresolve *number*

no arp unresolve

### Parameter Description

Parameter	Description
<i>number</i>	The maximum number of the unresolved ARP entries in the range from 1 to the ARP table size supported by the device.

### Defaults

The default is the ARP table size supported by the device.

### Command Mode

**Global configuration mode.**

Usage Guide If there are a large number of unresolved entries in the ARP cache table and they do not disappear after a period of time, this command can be used to limit the quantity of the unresolved entries.

### Configuration Examples

The following example sets the maximum number of the unresolved items to 500.

```
QTECH(config)# arp unresolve 500
```

### Related Commands

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

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

### Platform Description

N/A

## 2.19. clear arp-cache

Use this command to remove a dynamic ARP mapping record from the ARP cache table and clear an IP route cache table.

```
clear arp-cache [ vrf vrf_name | trusted ] [ ip [mask] ] | interface interface-name ]
```

### Parameter Description

Parameter	Description
trusted	Deletes trusted ARP entries. Dynamic ARP entries are deleted by default.
vrf <i>vrf_name</i>	Deletes dynamic ARP entries of the specified VRF instance. The default is the public instance.
ip	Deletes ARP entries of the specified IP address. If trusted value is specified, trusted ARP entries are deleted; otherwise, all dynamic ARP entries are deleted which is the default.
mask	Deletes ARP entries in a subnet mask. If trusted value is specified, trusted ARP entries in the subnet mask are deleted; otherwise, all dynamic ARP entries are deleted. The dynamic ARP entry specified by the IP address is deleted by default.
interface <i>interface-name</i>	Deletes dynamic ARP entries on the specified interface. Dynamic ARP entries are deleted on all interfaces by default.

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

This command can be used to refresh an ARP cache table.

On a NFPP-based (Network Foundation Protection Policy) device, it receives one ARP packet for every mac/ip address per second by default. If the interval of two clear arp times is within 1s, the second response packet will be filtered and the ARP packet will not be resolved for a short time.

**Configuration Examples****Related Commands****Platform Description**

The following example deletes all dynamic ARP mapping records.

```
QTECH# clear arp-cache
```

The following deletes the dynamic ARP entry 1.1.1.1.

```
QTECH# clear arp-cache 1.1.1.1
```

The following example deletes the dynamic ARP entry on interface SV11.

```
QTECH# clear arp-cache interface Vlan 1
```

Command	Description
arp	Adds a static mapping record to the ARP cache table.

N/A

**2.20. clear arp-cache oob**

Use this command to clear dynamic ARP mapping records.

```
clear arp-cache oob [ ip [ mask ] ]
```

**Parameter Description**

Parameter	Description
<i>ip</i>	Clears the ARP table entry of the specified IP address. All dynamic ARP table entries are cleared by default.
<i>mask</i>	Clears the ARP table entry within the specified subnet. The dynamic ARP table entry of the specified IP address (the previous parameter) is cleared by default.

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

On a device supporting Network Foundation Protection Policy (NFPP), every MAC / IP address receives an ARP packet per second by default. If the clear arp oob command is run twice within one second, the second response packet may be filtered, causing ARP analysis for a short time.

**Configuration Examples****Related Commands****Platform Description**

The following example clears the cache table of dynamic ARP mapping records.

```
QTECH# clear arp-cache oob
```

The following example clears dynamic ARP table entry 1.1.1.1.

```
QTECH# clear arp-cache oob 1.1.1.1
```

The following example clears the dynamic ARP table entry within the specified subnet.

```
QTECH# clear arp-cache oob 1.0.0.0 255.0.0.0
```

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

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

N/A

## 2.21. ip proxy-arp

Use this command to enable ARP proxy function on the interface. Use the **no** form of this command to restore the default setting.

```
ip proxy-arp no ip proxy-arp
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

**Command Mode** Interface configuration mode.

### Usage Guide

Proxy ARP helps those hosts without routing message obtain MAC address of other networks or subnet IP address. For example, a device receives an ARP request. The IP addresses of request sender and receiver are in different networks. However, the device that knows the routing of IP address of request receiver sends ARP response, which is Ethernet MAC address of the device itself.

### Configuration

The following example enables ARP on FastEthernet port 0/1.

### Examples

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# ip proxy-arp
```

### Related Commands

Command	Description
N/A	N/A





**Platform Description**

N/A

**2.22. local-proxy-arp**

Use this command to enable local proxy ARP on the SVI interface. Use the **no** form of this command to restore the default setting.

local-proxy-arp

**no local-proxy-arp****Parameter Description**

Parameter	Description
N/A	N/A

**Defaults**

N/A

**Command Mode**

Interface configuration mode

**Usage Guide**

With local proxy ARP enabled, the device helps a host to obtain MAC addresses of other hosts on the subnet. If the device enables switchport protected, users on different ports are segregated on layer 2. After local proxy ARP is enabled, the device serves as a proxy to send a response after receiving an ARP request. The ARP response contains a MAC address which is the device's Ethernet MAC address, realizing communication between different hosts through L3 routes.

**Configuration Examples**

```
QTECH(config)# interface vlan 1
QTECH(config-if-VLAN 1)# local-proxy-arp
```

The following example enables local proxy ARP on VLAN1.

**Related Commands**

Command	Description
N/A	N/A



**Platform Description**

N/A

**2.23. service trustedarp**

Use this command to enable the trusted ARP function. Use the no form of this command to restore

**Parameter Description**

the default setting.

service trustedarp

no service trustedarp

Parameter	Description
N/A	N/A

**Defaults**

This function is disabled by default.

**Command Mode**

Global configuration mode

Usage Guide The trusted ARP function of the device is to prevent the ARP fraud function. As a part of the GSN scheme, it should be used together with the GSN scheme.

**Configuration Examples****Related Commands****Platform Description**

The following example enables the trusted ARP function in global configuration mode.

```
QTECH(config)# service trustedarp
```

Command	Description
N/A	N/A



N/A

## 2.24. show arp

Use this command to display the Address Resolution Protocol (ARP) cache table

```
show arp [ interface-type interface-number | trusted [ip [mask]] | [vrf vrf-name] [ip [mask]] | mac-address | static | complete | incomplete ] ]
```

### Parameter Description

Parameter	Description
<i>interface-type</i> <i>interface-number</i>	Displays the ARP entry of a specified Layer-2 or Layer-3 port.
<b>vrf</b> <i>vrf_name</i>	VRF instance, which Displays the ARP entry with specified VRF.
<b>trusted</b>	Displays the trusted ARP entries. Currently, only the global VRF supports the trusted ARP.
<i>ip</i>	Displays the ARP entry of the specified IP address. If <b>trusted</b> is configured, only trusted ARP entries are displayed. Otherwise, untrusted ARP entries are displayed.
<i>mask</i>	Displays the ARP entries of the network segment included within the mask. If <b>trusted</b> is configured, only trusted ARP entries are displayed. Otherwise, untrusted ARP entries are displayed.
<b>static</b>	Displays all the static ARP entries.
<b>complete</b>	Displays all the resolved dynamic ARP entries.
<b>incomplete</b>	Displays all the unresolved dynamic ARP entries.
<i>mac-address</i>	Displays the ARP entry with the specified mac address.

### Defaults

N/A

## Command Mode

Privileged EXEC mode

## Usage Guide

N/A

## Configuration Examples

The following example displays the output result of the **show arp** command:

```
QTECH# show arp
Total Numbers of Arp: 7
Protocol Address Age(min) Hardware Type Interface
Internet 192.168.195.68 0 0013.20a5.7a5f arpa VLAN 1
Internet 192.168.195.67 0 001a.a0b5.378d arpa VLAN 1
Internet 192.168.195.65 0 0018.8b7b.713e arpa VLAN 1
Internet 192.168.195.64 0 0018.8b7b.9106 arpa VLAN 1
Internet 192.168.195.63 0 001a.a0b5.3990 arpa VLAN 1
Internet 192.168.195.62 0 001a.a0b5.0b25 arpa VLAN 1
Internet 192.168.195.5 -- 00d0.f822.33b1 arpa VLAN 1
```

The following example displays the output result of **show arp 192.168.195.68**

```
QTECH# show arp 192.168.195.68
Protocol Address Age(min) Hardware Type Interface Internet
192.168.195.68 1 0013.20a5.7a5f arpa VLAN 1
QTECH# show arp 192.168.195.0 255.255.255.0 Protocol Address
Age(min) Hardware Type Interface Internet 192.168.195.64 0
0018.8b7b.9106 arpa VLAN 1
Internet 192.168.195.2 1 00d0.f8ff.f00e arpa VLAN 1 Internet
192.168.195.5 -- 00d0.f822.33b1 arpa VLAN 1 Internet 192.168.195.1 0
00d0.f8a6.5af7 arpa VLAN 1
Internet 192.168.195.51 1 0018.8b82.8691 arpa VLAN 1
```

The following example displays the output result of **show arp 192.168.195.0 255.255.255.0**

```
QTECH# show arp 001a.a0b5.378d
Protocol Address Age(min) Hardware Type Interface Internet
192.168.195.67 4 001a.a0b5.378d arpa VLAN 1
```

The following example displays the output result of **show arp 001a.a0b5.378d**

The following example displays the output result of **show arp static**.

## 2. ARP Commands

```
QTECH# show arp static
Protocol  Address  Age(min) Hardware  Type      Interface  Origin
Internet 192.168.23.55 <static> 0000.0000.0010 arpa  VLAN 10
0
```

Configure

```
Internet 192.168.23.56 <static> 0000.0000.0020 arpa  VLAN 10
0
```

Authentication

```
Internet 192.168.23.57<static> 0000.0000.0020 arpa  VLAN
100 DHCP-Snooping
2 static arp entries exist.
```

## Related Commands

### Platform Description

The meaning of each field in the ARP cache table is described as below: Table 1 Fields in the ARP cache table

Field	Description
Protocol	Protocol of the network address, always to be Internet
Address	IP address corresponding to the hardware address
Age (min)	Age of the ARP cache record, in minutes; If it is not locally or statically configured, the value of the field is represented with "-".
Hardware	Hardware address corresponding to the IP address
Type	Hardware address type, ARPA for all Ethernet addresses
Interface	Interface associated with the IP addresses
Origin	Origin of static ARP entries.
Command	Description
N/A	N/A

N/A

## 2.25. show arp counter

Use this command to display the number of ARP entries in the ARP cache table.

```
show arp counter
```

### 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 output result of the **show arp counter** command:

```
QTECH#sho arp counter
ARP Limit:          75000
Count of static entries: 0
Count of dynamic entries: 1 (complete: 1 incomplete: 0)
Total:              1
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 2.26. show arp detail

Use this command to display the details of the Address Resolution Protocol (ARP) cache table.

```
show arp detail [ interface-type interface-number | trusted [ ip [ mask ] ] ] [ vrf vrf-name ] [ ip [ mask ] ]
```

| *mac-address* | static | complete | incomplete ] | subvlan { *subvlan-number* | min-max *min\_value max\_value* ]

### Parameter Description

Parameter	Description
<i>interface-type interface-number</i>	Displays the ARP of the layer 2 port or the layer 3 interface.
<b>vrf</b> <i>vrf_name</i>	VRF instance, which Displays the ARP entry with specified VRF.
<i>trusted</i>	Displays the trusted ARP entries. Currently, only the global VRF supports the trusted ARP.
<i>ip</i>	Displays the ARP entry of the specified IP address.
<i>ip mask</i>	Displays the ARP entries of the network segment included within the mask.
<i>mac-address</i>	Displays the ARP entry of the specified MAC address.
<i>static</i>	Displays all the static ARP entries.
<i>complete</i>	Displays all the resolved dynamic ARP entries.
<i>incomplete</i>	Displays all the unresolved dynamic ARP entries.
<b>subvlan</b>	Displays the ARP entries of the specified subvlan
<i>subvlan-number</i>	Subvlan ID
<b>min-max</b>	Displays the minimum and maximum subvlan ID
<i>min_value</i>	Minimum subvlan ID
<i>max_value</i> ]	Maximum subvlan ID.

### Defaults

N/A

## Command

### Privileged EXEC mode

Mode

### Usage Guide

Use this command to display the ARP details, such as the ARP type (Dynamic, Static, Local, Trust), the information on the layer2 port.

If you enter a *min\_value* greater than *max\_value*, no error message is prompted. Instead, ARP entries corresponding to the subvlan are displayed.

### Configuration Examples

The following example displays the output result of the show arp detail command:

```
QTECH# show arp detail
IP Address      MAC Address      Type      Age (min)  Interface  Port
SubVlan
20.1.1.2        0020.0101.0002   Static    --         Te2/5      -    --
                -
20.1.1.1        00d0.f822.33bb   Local     --         Te2/5      -    --
                -
1.1.1.2         00d0.1111.1112   Dynamic   1          V12        Te2/1   4
1.1.1.1         00d0.f822.33bb   Local     --         V12        --      --
```

The following example displays arp details including InnerVLAN on products supporting QinQ

termination:

```
QTECH# show arp detail
IP Address      MAC Address      Type      Age (min)  Interface  Port
SubVlan  InnerVlan
20.1.1.2        0020.0101.0002   Static    --         Te2/5      -    -
                -
20.1.1.1        00d0.f822.33bb   Local     --         Te2/5      -    -
                -
1.1.1.2         00d0.1111.1112   Dynamic   1          V12        Te2/1   4
300
1.1.1.1         00d0.f822.33bb   Local     --         V12        --      -
                -
```



The meaning of each field in the ARP cache table is described as below: Table 1 Fields in the ARP cache table

Field	Description
IP Address	IP address corresponding to the hardware address
MAC Address	hardware address corresponding to the IP address
Age (min)	Age of the ARP learning, in minutes
Port	Layer2 port associated with the ARP
Type	ARP type, includes the Static, Dynamic, Trust,Local
Interface	Layer 3 interface associated with the IP addresses
SubVLAN	SubVLAN corresponding to the ARP entries
InnerVLAN	InnerVLAN or CE-VLAN corresponding to the ARP entries
Subvni	Vni corresponding to the ARP entries, namely ID of the VxLAN.
Location	Local: ARP entries are generated or learned on the local device. Remote: ARP entries are synced from a remote gateway.

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 2.27. show arp oob

Use this command to display the ARP cache table.

```
show arp oob [ ip [ mask ] | static | complete | incomplete | mac-address ]
```

## Parameter Description

Parameter	Description
<i>ip</i>	Displays ARP table entries of the specified IP address.
<i>mask</i>	Displays ARP table entries within the IP subnet.
<b>static</b>	Displays all static ARP table entries.
<b>complete</b>	Displays all analyzed ARP table entries.
<b>incomplete</b>	Displays all unanalyzed ARP table entries.
<i>mac-address</i>	Displays ARP table entries of the specified MAC address.

## Defaults

N/A

## Command Mode

Privileged EXEC mode

## Usage Guide

This command is used to display the ARP cache table. The complete / incomplete key word represents analyzed / unanalyzed ARP table entries.

## Configuration Examples

The following example displays the outcome of the running the show arp oob command.

```
QTECH# show arp oob
Total Numbers of Arp: 7

Address                Age (min)  Hardware          Type  Interface
192.168.195.68         0          0013.20a5.7a5f   arpa  mgmt 0
192.168.195.67         0          001a.a0b5.378d   arpa  mgmt 0
192.168.195.65         0          0018.8b7b.713e   arpa  mgmt 0
192.168.195.64         0          0018.8b7b.9106   arpa  mgmt 0
192.168.195.63         0          001a.a0b5.3990   arpa  mgmt 0
192.168.195.62         0          001a.a0b5.0b25   arpa  mgmt 0
192.168.195.5          --         00d0.f822.33b1   arpa  mgmt 0
```

The following example displays the outcome of running the show arp oob 192.168.195.68 command.

```
QTECH# show arp oob 192.168.195.68
Protocol Address      Age (min)  Hardware          Type  Interface
Internet 192.168.195.68 0013.20a5.7a5f arpa  mgmt
```

The following example displays the outcome of running the show arp oob 192.168.195.0 255.255.255.0.

```
QTECH# show arp 192.168.195.0 255.255.255.0
Protocol   Address      Age (min)  Hardware          Type  Interface  Internet
192.168.195.64 0 0018.8b7b.9106 arpa mgmt 0
Internet 192.168.195.2 1 00d0.f8ff.f00e arpa mgmt 0 Internet 192.168.195.5
-- 00d0.f822.33b1 arpa mgmt 0 Internet 192.168.195.1 0
00d0.f8a6.5af7 arpa mgmt 0
Internet 192.168.195.51 1 0018.8b82.8691 arpa mgmt 0
```

## Related Commands

### Platform Description

The following example displays the outcome of running the show arp oob 001a.a0b5.378d command.

```
QTECH# show arp 001a.a0b5.378d
Protocol Address      Age (min)  Hardware          Type  Interface  Internet 192.168.195.67
4 001a.a0b5.378d arpa mgmt 0
```

Field	Description
Protocol	Only "Internet" is available at present, which indicates the IP protocol.



Address	The IPv4 address.
Age(min)	The age of the table entry. For the local IP address, the field is displayed as '-'. For the static table entry, the field is displayed as <static>. For the dynamic table entry, the field indicates the time for which the table entry has been learned, in the unit of minutes.
Hardware	48-bit MAC address, written as a dotted triple of four-digit hexadecimal numbers.
Type	Only "arpa" is available at present.
Interface	The L3 interface corresponding to the ARP table entry. The field is NULL for static ARP table entries for the IP address of the static ARP is not within any network segment directly connected with the device.

Command	Description
N/A	N/A

N/A

## 2.28. show arp packet statistics

Use this command to display the statistics of ARP packets.

**show arp packet statistics** [ *interface-name* ]

### Parameter Description

Parameter	Description
<i>interface-name</i>	Displays the statistics of ARP packets on the specified interface.

### Defaults

N/A.

**Command Mode**

Privileged EXEC mode.

**Usage Guide**

N/A.

**Configuration Examples****Related Commands****Platform Description**

The following example displays the output information of the command.

```
QTECH#show arp packet statistics
Interface          Received  Received Received  Sent      Sent
Name              R
requests Replies Others   Requests Replies
-----
GigabitEthernet 0/0    0        0        0        0        0
GigabitEthernet 0/1   143649   232      0        2        0
GigabitEthernet 0/2    0        0        0        0        0
GigabitEthernet 0/3    0        0        0        0        0
GigabitEthernet 0/4    0        0        0        0        0
GigabitEthernet 0/5    0        0        0        0        0
GigabitEthernet 0/6    0        0        0        0        0
Loopback 1        0        0        0        0        0
```

Description of fields:

Field	description
Received Requests	Number of received ARP requests
Received Replies	Number of received ARP response messages
Received Others	Number of other received ARP packets
Sent Requests	Number of sent ARP requests
Sent Replies	Number of sent ARP requests

Command	Description
N/A.	N/A.

N/A

## 2.29. show arp timeout

Use this command to display the aging time of a dynamic ARP entry on the interface.

```
show arp timeout
```

### 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 output of the show arp timeout command:

### Related Commands

```
QTECH# show arp timeout
Interface arp timeout(sec)
VLAN 1 3600
```

### Platform Description

The meaning of each field in the ARP cache table is described in Table 1.

Command	Description
N/A.	N/A.

N/A

## 2.30. show ip arp

Use this command to display the Address Resolution Protocol (ARP) cache table.

```
show ip arp [vrf vrf-name]
```

### Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF instance.

### Defaults

N/A.

### Command Mode

Privileged EXEC mode.

### Usage Guide

N/A.

### Configuration Examples

The following example displays the output of show ip arp:

```
QTECH# show ip arp
Protocol Address Age(min)Hardware Type Interface
Internet 192.168.7.233 23 0007.e9d9.0488 ARPA FastEthernet 0/0 Internet
192.168.7.112 10 0050.eb08.6617 ARPA FastEthernet 0/0 Internet
192.168.7.79 12 00d0.f808.3d5c ARPA FastEthernet 0/0 Internet 192.168.7.1
50 00d0.f84e.1c7f ARPA FastEthernet 0/0

Internet 192.168.7.215 36 00d0.f80d.1090 ARPA FastEthernet 0/0
Internet 192.168.7.127 0 0060.97bd.ebee ARPA FastEthernet 0/0
Internet 192.168.7.195 57 0060.97bd.ef2d ARPA FastEthernet 0/0
Internet 192.168.7.183 -- 00d0.f8fb.108b ARPA FastEthernet 0/0
```

The following example displays the output of show ip arp vrf *vpn4*.

## 2. ARP Commands

```
Qtech#show ip arp vrf vpnv4
Protocol Address      Age (min)  Hardware      Type  Interface
Internet 11.1.1.1      0          78e3.b5b6.f4dc arpa  GigabitEt
0/0
Internet 11.1.1.2      --         1111.2222.1111 arpa  GigabitEthernet
0/0
Total number of ARP entries: 2
```

### Related Commands

### Platform Description

Each field in the ARP cache table has the following meanings:

Field	Description
Protocol	Network address protocol, always Internet.
Address	The IP address corresponding to the hardware address.
Age (min)	Age of the ARP cache record, in minutes; If it is not locally or statically configured, the value of the field is represented with "-".
Hardware	Hardware address corresponding to the IP address
Type	The type of hardware address. The value is ARPA for all Ethernet addresses.
Interface	Interface associated with the IP address.

Command	Description
N/A.	N/A.

N/A



## 3. IPV6 COMMANDS

### 3.1. clear ipv6 neighbors

Use this command to clear the dynamic IPv6 neighbors.

```
clear ipv6 neighbors [ vrf vrf-name ] [ oob ] [interface-id]
```

#### Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name. All global IPv6 neighbors are cleared without specified VRF name by default.
<b>oob</b>	Clears the dynamic IPv6 neighbors discovered by neighbors on MGMT interface.
<i>interface-id</i>	Interface name. Clear the dynamically learned IPv6 neighbors on the specified interface.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

This command does not clear all the dynamic neighbors on authentication VLAN. Note that the static neighbors will not be cleared.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example clears the dynamic IPv6 neighbors.

```
QTECH# clear ipv6 neighbors
```

The following example clears all dynamic neighbors on the MGMT port.



```
QTECH# clear ipv6 neighbors oob
```

The following example clears all dynamic neighbors on the interface gigabitEthernet 0/1.

```
QTECH# clear ipv6 neighbors gigabitEthernet 0/1
```

Command	Description
ipv6 neighbor	Configures the neighbor.
show ipv6 neighbors	Displays the neighbor information.

N/A

### 3.2. ipv6 address

Use this command to configure an IPv6 address for a network interface. Use the no form of this command to restore the default setting.

```
ipv6 address ipv6-address/prefix-length
```

```
ipv6 address ipv6-prefix/prefix-length eui-64
```

```
ipv6 address prefix-name sub-bits/prefix-length [ eui-64 ]
```

```
no ipv6 address
```

```
no ipv6 address ipv6-address/prefix-length
```

```
no ipv6 address ipv6-prefix/prefix-length eui-64
```

```
no ipv6 address prefix-name sub-bits/prefix-length [ eui-64 ]
```

#### Parameter Description

Parameter	Description
<i>ipv6-prefix</i>	IPv6 address prefix in the format defined in RFC4291. The address shall be in hex; the fields in the address shall be separated by comma, and each field shall contain 16 bits.
<i>ipv6-address</i>	IPv6 address in the format defined in RFC4291. The address shall be in hex; the fields in the address shall be separated by comma, and each field shall contain 16 bits.
<i>prefix-length</i>	Length of the IPv6 prefix, the network address of the IPv6 address. Note: The prefix length range of the IPv6 address of the interface of

	S86 is 0 to 64 or 128 to 128.
<i>prefix-name</i>	The general prefix name. Use the specified general prefix to generate the interface address.
<i>sub-bits</i>	The value of the sub-prefix bit and the host bit generates the interface address combining with the general prefix. The value shall be in the format defined in the RFC4291.
eui-64	The generated IPV6 address consists of the address prefix and the 64 bit interface ID

### Defaults

N/A

### Command Mode

Interface configuration mode

### Usage Guide

When an IPv6 interface is created and the link status is UP, the system will automatically generate a local IP address for the interface.

The IPv6 address could also be generated using the general prefix. That is, the IPv6 address consists of the general prefix and the sub-prefix and the host bit. The general prefix could be configured using the **ipv6 general-prefix** command or may be learned through the DHCPv6 agent PD (Prefix Discovery) function (please refer to the *DHCPv6 Configuration*). Use the *sub-bits/prefix-length* parameter of this command to configure the sub-prefix and the host bit.

If no deleted address is specified when using **no ipv6 address**, all the manually configured addresses will be deleted.

The **no ipv6 address ipv6-prefix/prefix-length eui-64** command can be used to delete the addresses configured with **ipv6 address ipv6-prefix/prefix-length eui-64**.

### Configuration Examples

The following example configures an IPv6 address for the interface GigabitEthernet 0/1.

```
QTECH(config-if)# ipv6 address 2001:1::1/64 QTECH(config-if)# no
ipv6 address 2001:1::1/64 QTECH(config-if)# ipv6 address
```

```
2002:1::1/64 eui-64
```

```
QTECH(config-if)# no ipv6 address 2002:1::1/64 eui-64
```

The following example applies general prefix to configure an IPv6 address for the interface GigabitEthernet 0/1.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 address my-prefix
0:0:0:7272::72/64
```

**i** If the prefix 2001:1111:2222::/48 is configured under the general prefix name *my-prefix*, then the generated IPv6 address of the interface is 2001:1111:2222:7272::72/64

4.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 3.3. ipv6 address autoconfig

Use this command to automatically configure an IPv6 stateless address for a network interface. Use the no form of this command to restore the default setting.

```
ipv6 address autoconfig [ default ]
```

```
no ipv6 address autoconfig
```

### Parameter Description

Parameter	Description
default	(Optional) If this keyword is configured, a default routing is generated. Note that only one layer3 interface on the entire device is allowed to use the default keyword

### Defaults

N/A

### Command Mode

Interface configuration mode

## Usage Guide

The stateless automatic address configuration is that when receiving the RA (Route Advertisement) message, the device could use the prefix information of the RA message to automatically generate the EUI-64 interface address.

If the RA message contains the flag of the “other configurations”, the interface will obtain these “other

configurations” through the DHCPv6. The “other configurations” usually means the IPv6 address of the DNS server, the IPv6 address of the NTP server, etc.

Use the `no ipv6 address autoconfig` command to delete the IPv6 address.

## Configuration Examples

### Related Commands

### Platform Description

The following example automatically configures an IPv6 stateless address for a network interface and generates a default route.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 address autoconfig
default
```

The following example restores the default setting.

```
QTECH(config-if-GigabitEthernet 0/1)# no ipv6 address autoconfig
```

Command	Description
<code>ipv6 address ipv6-prefix/prefix-length [ eui-64 ]</code>	Configures the IPv6 address for the interface manually.

N/A

### 3.4. ipv6 icmp error-interval

Use this command to set the frequency with which ICMPv6-oversize error packets are sent. Use the

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

```
ipv6 icmp error-interval too-big milliseconds [ bucket-size ]
```

```
no ipv6 icmp error-interval too-big milliseconds [ bucket-size ]
```

Use this command to set the frequency with which other ICMPv6 error packets are sent. Use the `no`

form of this command to restore the default setting.

```
ipv6 icmp error-interval milliseconds [ bucket-size ]
```

```
no ipv6 icmp error-interval milliseconds [ bucket-size ]
```

### Parameter Description

Parameter	Description
<i>milliseconds</i>	Sets the refresh interval of the token bucket, in the range from 0 to 2147483647 in the unit of seconds. Setting the value to 0 indicates that the frequency with which ICMPv6 error packets are sent is not fixed.
<i>bucket-size</i>	Sets the number of tokens in the token bucket, in the range from 1 to 200.

### Defaults

The default *milliseconds* is 100 and *bucket-size* is 10.

### Command Mode

Global configuration mode

### Usage Guide T

The token bucket algorithm is adopted to set the frequency with which ICMPv6 error packets are sent

so as to prevent Denial of Service (DoS) attack,

If the forwarded IPv6 packet is greater than the egress IPv6 MTU in size, the router discards the IPv6 packet and sends the ICMPv6-oversize error packet to the source IPv6 address. This kind of ICMPv6 error packet is used for IPv6 path MTU discovery. If there are too many ICMPv6 error packets, the ICMPv6-oversize error packet may not be sent, causing IPv6 path MTU discovery failure. Therefore, it is recommended to set the frequency of ICMPv6-oversize error packet and other ICMPv6 error packet respectively. Note that ICMPv6 redirect packet is not an ICMPv6 error packet and QTECH sets the frequency of the ICMPv6 redirect packet the same as that of other ICMPv6 error packet.

For the timer is accurate to 10 milliseconds, it is recommended to set the refresh interval of the token bucket to an integer multiple of 10 milliseconds. If the refresh interval is not an integer multiple of 10 milliseconds, it is converted automatically. For example, the frequency



of 1 per five milliseconds turns out to be 2 per 10 milliseconds; the frequency of 3 per 15 milliseconds is converted to 2 per 10 milliseconds.

## Configuration Examples

### Related Commands

### Platform Description

The following example sets the frequency with which ICMPv6-oversize error packets are sent to 100 per second.

```
QTECH(config)# ipv6 icmp error-interval too-big 1000 100
```

The following example sets the frequency with which other ICMPv6 error packets are sent to 10 per second.

```
QTECH(config)# ipv6 icmp error-interval 1000 10
```

Command	Description
N/A	N/A

N/A

## 3.5. ipv6 enable

Use this command to enable the IPv6 function on an interface. Use the no form of this command to restore the default setting.

```
ipv6 enable no ipv6 enable
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is disabled by default.

### Command Mode

Interface configuration mode

## Usage Guide

The IPv6 function of an interface can be enabled by configuring `ipv6 enable` or by configuring IPv6

address for the interface.

**i** If an IPv6 address is configured for the interface, the IPv6 function will be enabled automatically on the interface and cannot be disabled with `no ipv6 enable`.

## Configuration Examples

### Related Commands

### Platform Description

The following example enables the IPv6 function on the interface GigabitEthernet 0/1.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 enable
```

Command	Description
<code>show ipv6 interface</code>	Displays the related information of an interface.

N/A

## 3.6. Ipv6 gateway

Use this command to configure the default gateway IPv6 address on the management port.

```
ipv6 gateway ipv6-address
```

### Parameter Description

Parameter	Description
<code>ipv6-address</code>	Configures the default gateway IPv6 address.

### Defaults

N/A

### Command Mode



## Interface configuration mode

**Usage Guide**

The management port is MGMT in type and 0 in ID.

**Configuration Examples**

```
QTECH(config)# interface mgmt 0 QTECH(config-int)# ipv6
gateway 2001:1::1 QTECH(config-int)# exit
QTECH(config)#
```

The following example configures the default gateway IPv6 address on the management port.

**Related Commands**

Command	Description
N/A	N/A

**Platform Description**

N/A

**3.7. ipv6 general-prefix**

Use this command to configure the IPv6 general prefix in the global configuration mode.

```
ipv6 general-prefix prefix-name ipv6-prefix/prefix-length
```

```
no ipv6 general-prefix prefix-name ipv6-prefix/prefix-length
```

**Parameter Description**

Parameter	Description
<i>prefix-name</i>	The general prefix name.
<i>pv6-prefix</i>	The network prefix value of the general-prefix following the format defined in RFC4291.
<i>prefix-length</i>	The length of the general prefix.

Defaults

N/A

## Command Mode

Global configuration mode.

## Usage Guide

It is convenient to number the network by using the general prefix, which defines a prefix so that many longer specified prefixes could refer to it. These specified prefixes are updated whenever the general prefix changes. If the network number changes, just modify the general prefix.

A general prefix could contain multiple prefixes.

These longer specified prefixes are usually used for the ipv6 address configuration on the interface.

## Configuration Examples

### Related Commands

### Platform Description

The following example configures manually a general prefix as my-prefix.

```
QTECH(config)# ipv6 general-prefix my-prefix 2001:1111:2222::/48
```

Command	Description
ipv6 address prefix-name sub-bits/prefix-length	Configures the interface address using the general prefix.
show ipv6 general-prefix	Displays the general prefix.

N/A

## 3.8. ipv6 hop-limit

Use this command to configure the default hopcount to send unicast messages in the global configuration mode.

ipv6 hop-limit *value*

no ipv6 hop-limit

### Parameter Description

Parameter	Description
<i>value</i>	Hopcount ranging from 1 to 255.

### Defaults

The default is 64.

### Command Mode

Global configuration mode.

### Usage Guide

This command takes effect for the unicast messages only, not for multicast messages.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the default hopcount to 100.

```
QTECH(config)# ipv6 hop-limit 100
```

Command	Description
N/A	N/A

N/A

## 3.9. ipv6 mtu

Use this command to configure the MTU of IPv6 packets. Use the no form of this command to restore the default setting.

```
ipv6 mtu bytes
```

```
no ipv6 mtu
```

### Parameter Description

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

<i>bytes</i>	MTU of IPv6 packets, in bytes. The value ranges from 1,280 to 1,500.
--------------	----------------------------------------------------------------------

### Defaults

The default configuration is the same as the configuration of the mtu command.

### Command Mode

Interface configuration mode

### Usage Guide

If the size of an IPv6 packet exceeds the IPv6 MTU, the RGOS software segments the packet. For all devices in the same physical network segment, the IPv6 MTU of the interconnected interface must be the same.

### Configuration Examples

```
QTECH(config)# interface fastEthernet 0/1
QTECH(config-if)# ipv6 mtu 1400
```

The following example sets the IPv6 MTU of the FastEthernet 0/1 interface to 1400 bytes.

### Related Commands

Command	Description
mtu	Sets the MTU of an interface.

### Platform Description

This command cannot be used on Layer 2 devices.

## 3.10. ipv6 nd cache interface-limit

Use this command to set the maximum number of neighbors learned on the interface. Use the **no**

form of this command to restore the default setting.

ipv6 nd cache interface-limit *value*

**no ipv6 nd cache interface-limit**

### Parameter Description

Parameter	Description
<i>value</i>	Sets the maximum number of neighbors learned on the interface, including the static and dynamic neighbors, in the range from 0 to the number supported by the device. 0 indicates the number is not limited.

### Defaults

The default is 0.

### Command Mode

Interface configuration mode

**Usage Guide** This function can prevent neighbor entries generated by malicious neighbor attacks from consuming memory. *limit* must be no smaller than the number of neighbors learned on the interface. Otherwise, the configuration does not take effect.

### Configuration Examples

The following example sets the number of neighbors learned on the interface to 100.

```
QTECH(config)# interface GigabitEthernet 0/1
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd cache interface-limit 100
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 3.11. ipv6 nd dad attempts

Use this command to set the number of the NS packets to be continuously sent for IPv6 address collision check on the interface. Use the **no** form of this command to restore it to the default setting. **ipv6 nd dad attempts value**

no ipv6 nd dad attempts *value*

### Parameter Description



Parameter	Description
<i>value</i>	Number of the NS packets. If it is set to 0, it indicates that the IPv6 address collision check is disabled on the interface. The range is 0 to 600.

### Defaults

The default is 1.

### Command Mode

Interface configuration mode.

### Usage Guide

When the interface is configured with a new IPv6 address, the address collision shall be checked before the address is assigned to the interface, and the address shall be in the "tentative" status. After the address collision check is completed, if no collision is detected, the address can be used normally; if collision is detected and the interface ID of the address is an EUI-64 ID, it indicates that the link-layer address is repeated, and the system will automatically shut down the interface (that is, to prohibit IPv6 operations on the interface). In this case, you shall modify and configure a new address manually, and restart address collision check for the **down/up** interface. Whenever the state of an interface changes from **down** to **up**, the address collision check function of the interface will be enabled.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the number of the NS packets.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd dad attempts 3
```

Command	Description
show interface ipv6	Displays the interface information.

N/A

### 3.12. Ipv6 nd dad retry

Use this command to set the interval for address conflict detection. Use the no form of this command to restore the default setting.

```
ipv6 nd dad retry value
```

```
no ipv6 nd dad retry
```

#### Parameter Description

Parameter	Description
<i>value</i>	Sets the interval for address conflict detection, 60 seconds by default. Setting <i>value</i> to 0 indicates that the function is disabled.

#### Defaults

N/A

#### Command

Global configuration mode

Mode

#### Usage Guide

Before configuring a new IPv6 address for an interface, enable address conflict detection on the interface. If a conflict address is detected, the device does not receive the IPv6 packet destined to the conflict address. This command is used to perform conflict detection again when the interval expires. If there is no conflict, the address can be used.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the interval for address conflict detection to 10s.

```
QTECH(config)# ipv6 nd dad retry 10
```

Command	Description
N/A	N/A

N/A

### 3.13. ipv6 nd managed-config-flag

Use this command to set the “managed address configuration” flag bit of the RA message. Use the

no form of this command to restore the default setting.

ipv6 nd managed-config-flag no ipv6 nd managed-config-flag

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

N/A

#### Command

#### Mode

**Interface configuration mode.**

**Usage Guide** This flag determines whether the host that receives the RA message obtains an IP address through stateful auto configuration. If the flag is set, the host obtains an IP address through stateful auto configuration, otherwise it does not be used.

#### Configuration Examples

#### Related Commands

The following example set the “managed address configuration” flag bit of the RA message.

Command	Description
show ipv6 interface	Displays the interface information.
ipv6 nd other-config-flag	Sets the flag for obtaining all information except IP address through stateful auto configuration.

```
QTECH(config-if) # ipv6 nd managed-config-flag
```





## Platform Description

N/A

### 3.14. Ipv4 nd max-opt

Use this command to set the maximum number of ND options. Use the no form of this command to restore the default setting.

```
ipv6 nd max-opt value
```

```
no ipv6 nd max-opt
```

## Parameter Description

Parameter	Description
<i>value</i>	Sets the maximum number of ND options, in the range from 1 to 100.

**Defaults**

The default is 10.

**Command**

Mode Global configuration mode

**Usage Guide**

This command is used to set the maximum number of ND options, such as source link layer address option, MTU option, redirection option and prefix option.

**Configuration Examples****Related Commands****Platform Description**

The following example sets the maximum of ND options to 20.

```
QTECH(config)# ipv6 nd max-opt 20
```

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

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

N/A

### 3.15. ipv6 nd ns-interval

Use this command to set the interval for the interface to retransmitting NS (Neighbor Solicitation). Use the no form of this command to restore the default setting.

```
ipv6 nd ns-interval milliseconds
```

```
no ipv6 nd ns-interval
```

#### Parameter Description

Parameter	Description
<i>milliseconds</i>	Interval for retransmitting NS in the range of 1000 to 429467295 milliseconds

#### Defaults

The default value in RA is 0 (unspecified); the interval for retransmitting NS is 1,000 milliseconds (1 second).

#### Command mode

Interface configuration mode.

#### Usage Guide

The configured value will be advertised through RA and will be used by the device itself. It is not recommended to set a too short interval.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the interval to 2,000 milliseconds, namely 2 seconds.

```
QTECH(config-if)# ipv6 nd ns-interval 2000
```

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

show ipv6 interface	Displays the interface information.
---------------------	-------------------------------------

N/A

### 3.16. ipv6 nd other-config-flag

Use this command to set “other stateful configuration” flag bit of the RA message. Use the **no** form of this command to delete the flag bit.

```
ipv6 nd other-config-flag
```

```
no ipv6 nd other-config-flag
```

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

The flag bit is not set by default.

#### Command mode

Interface configuration mode.

#### Usage Guide

With this flag bit set, the flag bit of the RA message sent by the device is set. After receiving this flag bit, the host uses the dhcpv6 to acquire the information excluding the IPv6 address for the purpose of automatic configuration. When the **managed address configuration** is set, the default **other stateful configuration** is also set

#### Configuration Examples

#### Related Commands

Command	Description
show ipv6 interface	Displays the interface information.

The following example sets “other stateful configuration” flag bit of the RA message.

```
uijie(config-if-GigabitEthernet 0/1)# ipv6 nd other-config-flag
```

#### Platform Description

### 3.17. ipv6 nd prefix

Use this command to configure the address prefix included in the RA. Use the no form of this command to delete the set prefix or restore the default setting.

```
ipv6 nd prefix { ipv6-prefix/prefix-length | default } [ [ valid-lifetime preferred-lifetime ] | [ at valid-date preferred-date ] | [ infinite | preferred-lifetime ] ] [ no-advertise ] | [ [ off-link ] [ no-autoconfig ] ]
```

```
no ipv6 nd prefix { ipv6-prefix/prefix-length | default }
```

#### Parameter Description

Parameter	Description
<i>ipv6-prefix</i>	IPv6 network ID following the format defined in RFC4291
<i>prefix-length</i>	Length of the IPv6 prefix. "/" shall be added in front of the prefix
<i>valid-lifetime</i>	Valid lifetime of the RA prefix received by the host
<i>preferred-lifetime</i>	Preferred lifetime of the RA prefix received by the host
<i>at valid-date preferred-date</i>	Sets the dead line for the valid lifetime and that of the preferred lifetime, in day, month, year, hour, minute.
<i>infinite</i>	Indicates that the prefix is always valid.
<i>default</i>	Sets the default prefix.
<i>no-advertise</i>	The prefix will not be advertised by the device.
<i>off-link</i>	When the host sends an IPv6 packet, if the prefix of the destination address matches the set prefix, it is considered that the destination is on-link and is directly reachable. If this option is set, it indicates that the prefix is not used for on-link judgment.
	Indicates that the RA prefix received by the host

no-autoconfig	cannot be used for auto address configuration.
---------------	------------------------------------------------

### Defaults

By default, the advertised prefix is the one set with ipv6 address on the interface. The default parameters of the prefix configured in the RA are as follows:

*valid-lifetime: 2592000s (30 days) preferred-lifetime: 604800s (7 days),*

The prefix is advertised and is used for on-link judgment and auto address configuration.

### Command Mode

Interface configuration mode.

### Usage Guide

This command can be used to configure the parameters of each prefix, including whether to advertise the prefix. By default, the prefix advertised in RA is the one set with ipv6 address on the interface. To add other prefixes, use this command.

ipv6 nd prefix default

Set the default parameters to be used by the interface. If no parameter is specified for an added prefix, the parameters set with ipv6 nd prefix default will be used. Note that after a parameter is specified for the prefix, the default configuration will not be used. That is to say, the configuration of

the prefix cannot be modified with ipv6 nd prefix default; only the prefix that uses all the default configurations can be modified with this command.

at *valid-date preferred-date*

The valid lifetime of a prefix can be specified in two ways. One way is to specify a fixed time for each prefix in the RA; the other way is to specify the end time (in this mode, the valid lifetime of the prefix sent in RA will be gradually reduced until the end time is 0).

### Configuration Examples

The following example adds a prefix for SVI 1.

```
QTECH(config)# interface vlan 1
QTECH(config-if)# ipv6 nd prefix 2001::/64 infinite 2592000
```

The following example sets the default prefix parameters for SVI 1 (they cannot be used for auto address configuration):

```
QTECH(config)# interface vlan 1
QTECH(config-if)# ipv6 prefix default no-autoconfig
```

### Related Commands

## Platform Description

If no parameter is specified, the default parameters will be used, and the prefix cannot be used for auto address configuration.

Command	Description
show ipv6 interface	Displays the RA information of an interface.

N/A

### 3.18. ipv6 nd ra-hoplimit

Use this command to set the hopcount of the RA message. Use the no form of this command to restore the default setting.

ipv6 nd ra-hoplimit *value*

no ipv6 nd ra-hoplimit

#### Parameter Description

Parameter	Description
<i>value</i>	Hopcount

#### Defaults

The default is 64.

#### Command Mode

Interface configuration mode.

#### Usage Guide

This command is used to set the hopcount of the RA message.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the hopcount to 110.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd ra-hoplimit 110
```

Command	Description
show ipv6 interface	Displays the interface information.
pv6 nd ra-lifetime	Sets the lifetime of the device.
ipv6 nd ra-interval	Sets the interval of sending the RA message.
ipv6 nd ra-mtu	Sets the MTU of the RA message.

N/A

### 3.19. ipv6 nd ra-interval

Use this command to set the interval of sending the RA. Use the no form of this command to restore the default setting.

```
ipv6 nd ra-interval { seconds | min-max min_value max_value }
```

```
no ipv6 nd ra-interval
```

#### Parameter Description

Parameter	Description
<i>seconds</i>	Interval of sending the RA message in seconds, 3-1800s.
min-max	Maximum and minimum interval sending the RA message in seconds
<i>min_value</i>	Minimum interval sending the RA message in seconds
<i>max_value</i>	Maximum interval sending the RA message in seconds

#### Defaults

200s. The actual interval of sending the RA message will be fluctuated 20% based on 200s.

#### Command Mode

Interface configuration mode.

### Usage Guide

If the device serves as the default device, the set interval shall not be longer than the lifetime of the device. Besides, to ensure other devices along the link occupies network bandwidth while sending the RA message, the actual interval for sending the RA message will be fluctuated 20% based on the set value.

If the key word min-max is specified, the actual interval for sending the packet will be chosen between the range of minimum value and maximum value.

### Configuration Examples

The following example sets the interval to 110 seconds.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd ra-interval 110
```

The following example sets the interval to between 110 and 120 seconds.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd ra-interval min-max  
110 120
```

### Related Commands

Command	Description
show ipv6 interface	Displays the interface information.
ipv6 nd ra-lifetime	Sets the lifetime of the device.
ipv6 nd ra-hoplimit	Sets the hopcount of the RA message.
ipv6 nd ra-mtu	Sets the MTU of the RA message.

### Platform Description

N/A

## 3.20. ipv6 nd ra-lifetime

Use this command to set the device lifetime of the RA sent on the interface. Use the no form of this command to restore the default setting.

```
ipv6 nd ra-lifetime seconds
```

```
no ipv6 nd ra-lifetime
```



**Parameter Description**

Parameter	Description
<i>seconds</i>	Default life time of the device on the interface, in the range from 0 to 9000 in the unit of seconds.

**Defaults**

The default is 1,800.

**Command Mode**

Interface configuration mode.

**Usage Guide** The router lifetime field is available in each RA. It specifies the time during which the hosts along the link of the interface can select the device as the default device. If the value is set to 0, the device will not serve as the default device any longer. If it is not set to 0, it shall be larger than or equal to the interval of sending the RA (ra-interval)

**Configuration Examples****Related Commands****Platform Description**

The following example sets the device lifetime to 2,000 seconds.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd ra-lifetime 2000
```

Command	Description
show ipv6 interface	Displays the interface information.
ipv6 nd ra-interval	Sets the interval of sending the RA.
ipv6 nd ra-hoplimit	Sets the hopcount of the RA.
ipv6 nd ra-mtu	Sets the MTU of the RA.

N/A

**3.21. ipv6 nd ra-mtu**

Use this command to set the MTU of the RA message. Use the **no** form of this command to restore the default setting.

**ipv6 nd ra-mtu** *value*

no ipv6 nd ra-mtu

### Parameter Description

Parameter	Description
<i>value</i>	MTU value, in the range from 0 to 4294967295.

### Defaults

IPv6 MTU value of the network interface.

### Command Mode

Interface configuration mode.

### Usage Guide

If it is specified as 0, the RA will not have the MTU option

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the MTU to 1,4000 bytes.

```
QTECH(config -if) # ipv6 nd ra-mtu 1400
```

Command	Description
show ipv6 interface	Displays the interface information.
ipv6 nd ra-lifetime	Sets the lifetime of the device.
ipv6 nd ra-interval	Sets the interval of sending the RA message.
ipv6 nd ra-hoplimit	Sets the hopcount of the RA message.

N/A

## 3.22. ipv6 nd reachable-time

Use this command to set the reachable time after the interface checks the reachability of the neighbor dynamically learned through NDP. Use the no form of this command to restore the default setting. `ipv6 nd reachable-time milliseconds`

`no ipv6 nd reachable-time`

### Parameter Description

Parameter	Description
<i>milliseconds</i>	Reachable time for the neighbor in the range from 0 to 3,600,000 in the unit of milliseconds.

### Defaults

The default value in RA is 0 (unspecified); the reachable time for the neighbor is 30,000 milliseconds (30 seconds) when the device discovers the neighbor.

### Command Mode

Interface configuration mode.

### Usage Guide

The device checks the unreachable neighbor through the set time. A shorter time means that the device can check the neighbor failure more quickly, but more network bandwidth and device resource will be occupied. Therefore, it is not recommended to set a too short reachable time.

The configured value will be advertised through RA and will be used by the device itself. If the value is set to 0, it indicates that the time is not specified, that is, the default value is used.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the reachable time to 1,000,000 milliseconds, namely 1,000 seconds.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd reachable-time 1000000
```

Command	Description
show ipv6 interface	Displays the interface information.

N/A

### 3.23. ipv6 nd resolve vlan

Use this command to enable active sending of NS resolution requests to a specific sub VLAN of a super VLAN. Use the no form of this command to disable the active sending of NS resolution requests to a specific sub VLAN of a super VLAN. Use the default form of this command to restore the default settings. `ipv6 nd resolve vlan {vlan-list | none}`

`no ipv6 nd resolve vlan {vlan-list | none} default ipv6 nd resolve vlan`

#### Parameter Description

Parameter	Description
<i>vlan-list</i>	Sets the list of sub VLANs in a super VLAN, where NS resolution requests are sent only to these sub VLANs.
none	Specifies that no NS resolution request is sent to any sub VLAN of a super VLAN.

#### Defaults

The function is disabled by default.

#### Command Mode

Global configuration mode

#### Default Level 2

**Usage Guide** If many sub VLANs exist in a super VLAN, when the device sends NS resolution requests to learn ND entries of the peer, the NS resolution requests are sent to the entire super VLAN by default. In this case, too many sub VLANs may cause a great number of packet replications, and therefore affect device performance.

Most STAs (such as PCs and servers) request information about ND neighbors from the gateway before accessing the network. Therefore, it is unnecessary to actively broadcast NS resolution requests to the sub VLANs where these STAs reside. For dumb terminals that

do not actively send NA advertisements, run the `ipv6 nd resolve vlan vlan-list` command to resolve and send ND entries to VLANs in the specified VLAN list.

❗ After the `ipv6 ns resolve vlan vlan-list` command is configured, NS resolution requests are sent only to VLANs in the VLAN list of a super VLAN. It should be particularly noted that if authentication-free

VLANs are configured but not included in the VLAN list specified in the `ipv6 nd resolve vlan` command, NS resolution requests are not broadcast to the authentication-free VLANs.

### Configuration Examples

The following example enables the device to provide active NS resolution for VLANs 10–20 and VLANs 25–30.

```
QTECH(config)# ipv6 nd resolve vlan 10-20, 25-30
```

The following example removes active NS resolution of VLANs 10–20.

```
QTECH(config)# no ipv6 nd resolve vlan 10-20
```

The following example configures the device not to provide active NS resolution for any sub VLAN of a super VLAN.

```
QTECH(config)# ipv6 nd resolve vlan none
```

### Verification

Run the `show running-config` command to display configurations.

## 3.24. ipv6 nd state-time

Use this command to set the period for the neighbor to maintain the state. Use the `no` form of this command to restore the default setting.

```
ipv6 nd stale-time seconds
```

```
no ipv6 nd stale-time
```

### Parameter Description

Parameter	Description
<i>Seconds</i>	Sets the period for the neighbor to maintain the state, in the range from 0 to 86400 in the unit of seconds.

### Defaults

The default is 3600.

### Command Mode

lobal configuration mode

### Usage Guide

This command is used to set the period for the neighbor to maintain the state. After the period expires, neighbor unreachability detection is performed. The shorter the period, the faster the neighbor is found unreachable. On the other hand, more network bandwidth and device resources are consumed. Therefore, it is recommended to set a value not too small.

### Configuration Examples

The following example sets the period to 600 seconds for the neighbor to maintain the state.

```
QTECH(config)# ipv6 nd stale-time 600
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 3.25. ipv6 nd suppress-auth-vlan-ns

Use this command to disable the SVI interface from sending the NS packet to the authentication VLAN. Use the **no** form of this command to disable this function.

```
ipv6 nd suppress-auth-vlan-ns
```

```
no ipv6 nd suppress-auth-vlan-ns
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Interface configuration mode

## Usage Guide

This command is supported on the SVI interface in gateway authentication mode.

## Configuration Examples

### Related Commands

### Platform Description

The following example enables VLAN 2 to send the NS packet to the authentication VLAN.

```
QTECH(config-if-VLAN 2)# no ipv6 nd suppress-auth-vlan-ns
```

Command	Description
N/A	N/A

N/A

### 3.26. ipv6 nd suppress-ra

Use this command to disable the interface from sending the RA message. Use the no form of this command to enable the function.

```
ipv6 nd suppress-ra no ipv6 nd suppress-ra
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

The ipv6 nd suppress-ra command is enabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

This command suppresses the sending of the RA message on an interface.

## Configuration Examples

### Related Commands

### Platform Description

The following example disables the interface from sending the RA message.

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 nd suppress-ra
```

Command	Description
show ipv6 interface	Displays the interface information.

N/A

### 3.27. ipv6 nd unresolved

Use this command to set the maximum number of the unresolved neighbor table entries. Use the no

form of this command to restore the default setting.

```
ipv6 nd unresolved number
```

```
no ipv6 nd unresolved
```

### Parameter Description

Parameter	Description
<i>number</i>	Sets the maximum number of the unresolved neighbor table entries, in the range from 1 to the neighbor table size supported by the device.

### Defaults

The default is 0. (The maximum number is the neighbor table size supported by the device)

### Command Mode

Global configuration mode

Usage Guide This command is used to prevent unresolved ND table entries generated by malicious scan attacks from consuming table entry resources,



## Configuration Examples

### Related Commands

The following example sets the maximum number of the unresolved neighbor table entries to 200.

```
QTECH(config)# ipv6 nd unresolved 200
```

Command	Description
N/A	N/A

### Platform Description

N/A

## 3.28. ipv6 neighbor

Use this command to configure a static neighbor. Use the no form of this command to delete a static neighbor.

```
ipv6 neighbor ipv6-address interface-id hardware-address
```

```
no ipv6 neighbor ipv6-address interface-id
```

### Parameter Description

Parameter	Description
<i>ipv6-address</i>	The neighbor IPv6 address, in the form as defined in RFC4291.
<i>interface-id</i>	Specifies the network interface where the neighbor is (including Router Port, L3 AP port and SVI interface).
<i>hardware-address</i>	The 48-bit MAC address, a dotted triple of four-digit hexadecimal numbers.

### Defaults

No static neighbor is configured by default.

## Command Mode

Global configuration mode

## Usage Guide

This command can only be configured on the interface enabled with IPv6 protocol, similar to the ARP command.

If the neighbor to be configured has been learned through Neighbor Discovery Protocol (NDP) and stored in the NDP neighbor table, the dynamic neighbor turns to be static. If the static neighbor is valid, it is always reachable. An invalid static neighbor refers to the neighbor whose IPv6 address is not valid (not in the IPv6 network segment configured for the interface or interface address conflict). The packet is not forwarded to the MAC address as specified by the invalid static neighbor. The invalid static neighbor is in inactive state. Use the `show ipv6 neighbor static` command to display the state of the static neighbor.

Use the `clear ipv6 neighbors` command to clear all neighbors learned dynamically through NDP.

## Configuration Examples

### Related Commands

### Platform Description

The following example configures a static neighbor on SVI 1.

```
QTECH(config)# ipv6 neighbor 2001::1 vlan 1 00d0.f811.1111
```

Command	Description
N/A	N/A

N/A

### 3.29. ipv6 ns-linklocal-src

Use this command to set the local address of the link as the source IP address to send neighbor requests. Use the `no` form of this command to use the global IP address `w` as the source address to send neighbor requests.

```
ipv6 ns-linklocal-src
```

```
no ipv6 ns-linklocal-src
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

The local address of the link is always used as the source address to send neighbor requests.

### Command Mode

Global configuration mode.

### Usage Guide

N/A

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the local address of the link as the source IP address to send neighbor requests.

```
QTECH(config)# no ipv6 ns-linklocal-src
```

Command	Description
N/A	N/A

N/A

## 3.30. ipv6 redirects

Use this command to control whether to send ICMPv6 redirect message when the switch receives and forwards an IPv6 packet through an interface. Use the no form of this command to restore the default setting.

```
ipv6 redirects no ipv6 redirects
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Interface configuration mode.

### Usage Guide

The transmission rate of any ICMPv6 error message is limited. By default, it is 10pps.

### Configuration Examples

The following example enables ICMPv6 redirection on interface GigabitEthernet 0/1.

### Related Commands

### Platform Description

```
QTECH(config-if-GigabitEthernet 0/1)# ipv6 redirects
```

Command	Description
show ipv6 interface	Displays the interface information.

N/A

## 3.31. ipv6 source-route

Use this command to forward the IPv6 packet with route header. Use the no form of this command to restore the default setting.

ipv6 source-route

no ipv6 source-route

### Parameter Description

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

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

### Defaults

The ipv6 source-route command is disabled by default.

### Command Mode

Global configuration mode.

### Usage Guide

Because of the potential security of the header of type 0 route, it's easy for the device to suffer from the denial service attack. Therefore, forwarding the IPv6 packet with route header is disabled by default. However, the IPv6 packet of route header with type 0 that destined to the local machine is processed.

### Configuration Examples

#### Related Commands

Command	Description
N/A	N/A

The following example forwards the IPv6 packet with route header.

```
QTECH(config)# no ipv6 source-route
```

Platform Description

N/A

## 3.32. show ipv6 address

Use this command to display the IPv6 addresses.

```
show ipv6 address [ interface-name ]
```

#### Parameter Description

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

### Defaults

## Command Mode

Privileged EXEC mode.

## Usage Guide

N/A

## Configuration Examples

The following example displays all IPv6 address configured on the device.

```
QTECH#show ipv6 addr
Global unicast address limit: 1024, Global unicast address count: 2 Tentative address
count: 3,Duplicate address count: 0
Preferred address count: 0,Deprecated address count: 0
GigabitEthernet 0/5
  2003:1::23/64                               Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  fe80::2d0:f8ff:febf:deb2/64                 Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  2005:1::1111/64                             Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
QTECH#
```

```
QTECH#show ipv6 addr gi 0/5 Global unicast
address count: 2
Tentative address count: 3,Duplicate address count: 0 Preferred
address count: 0,Deprecated address count: 0
  2003:1::23/64                               Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  fe80::2d0:f8ff:febf:deb2/64                 Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  2005:1::1111/64                             Tentative
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
```

The following example displays the IPv6 address configured on the GigabitEthernet 0/1.

## Related Commands

## Platform Description

```
QTECH#
```

Command	Description
N/A	N/A

N/A

### 3.33. show ipv6 general-prefix

Use this command to display the information of the general prefix.

show ipv6 general-prefix

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

Use this command to display the information of the general prefix including the manually configured and learned from the DHCPv6 agent.

#### Configuration Examples

```
The following example displays the information of the general prefix.QTECH# show ipv6
general-prefix
There is 1 general prefix.
IPv6 general prefix my-prefix, acquired via Manual configuration 2001:1111:2222::/48
2001:1111:3333::/48
```

#### Related Commands

Command	Description
ipv6 general-prefix	Configures the general prefix.

**Platform Description**

N/A

**3.34. show ipv6 interface**

Use this command to display the IPv6 interface information.

```
show ipv6 interface [ interface-id ] [ ra-info ] [ brief [ interface-id ] ]
```

**Parameter Description**

Parameter	Description
<i>interface-id</i>	Interface (including Ethernet interface, aggregate port, or SVI)
ra-info	Displays the RA information of the interface.
<i>brief</i>	Displays the brief information of the interface (interface status and address information).

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode.

**Usage Guide**

Use this command to display the address configuration, ND configuration and other information of an IPv6 interface.

**Configuration Examples**

```
QTECH# show ipv6 interface vlan 1
Interface vlan 1 is Up, ifindex: 2001
address(es):
Mac Address: 00:00:00:00:00:01
INET6: fe80::200:ff:fe00:1 , subnet is fe80::/64
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
```





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```

INET6: 2001::1 , subnet is 2001::/64 [TENTATIVE]
Joined group address(es):
ff01:1::1
ff02:1::1
ff02:1::2
ff02:1::1:ff00:1
MTU is 1500 bytes
ICMP error messages limited to one every 10 milliseconds
ICMP redirects are enabled
ND DAD is enabled, number of DAD attempts: 1
ND reachable time is 30000 milliseconds
ND advertised reachable time is 0 milliseconds
ND retransmit interval is 1000 milliseconds
ND advertised retransmit interval is 0 milliseconds
ND router advertisements are sent every 200 seconds<240--160>
ND device advertisements live for 1800 seconds

```

The following example displays the information of the IPv6 interface.

The following line is included in the above information: 2001::1, subnet is 2001::/64 [TENTATIVE]. The flag bit in the [ ] following the INET6 address is explained as follows:

Flag	Meaning
ANYCAST	Indicate that the address is an anycast address.
TENTATIVE	Indicate that the DAD is underway. The address is a tentative before the DAD is completed.
DUPLICATED	Indicate that a duplicate address exists.
DEPRECATED	Indicate that the preferred lifetime of the address expires.
NODAD	Indicate that no DAD is implemented for the address.
AUTOIFID	Indicate that the interface ID of the address is automatically generated by the system, which is usually an EUI-64 ID.

PRE	Indicate the IP stateless address that is automatically configured.
GEN	Indicate the IP address that is generated by the general prefix.

```
QTECH# show ipv6 interface vlan 1 ra-info vlan 1:
DOWN
RA timer is stopped waits: 0,
initcount: 3
statistics: RA(out/in/inconsistent): 4/0/0, RS(input): 0 Link-
layer address: 00:00:00:00:00:01
Physical MTU: 1500
ND device advertisements live for 1800 seconds
ND device advertisements are sent every 200 seconds<240--160> Flags:
!M!O, Adv MTU: 1500
ND advertised reachable time is 0 milliseconds ND
advertised retransmit time is 0 milliseconds ND
advertised CurHopLimit is 64
Prefixes: (total: 1)
fec0:1:1:1::/64(Def,Auto,vltime: 2592000, pltime: 604800, flags: LA)
```

The following example displays the RA information of the IPv6 interface.

Description of the fields in ra-info:

field	Meaning
RA timer is stopped (on)	Indicate whether the RA timer is started.
waits	Indicate that the RS is received but the number of the responses is not available.
initcount	Indicate the number of the RAs when the RA timer is restarted.
RA(out/in/inconsistent)	out: Indicate the number of the RAs that are sent. In: Indicate the number of the RAs that are received. inconsistent: Indicate the number of the received RAs in which the parameters are different from

	those contained in the RAs advertised by the device.
RS(input)	Indicate the number of the RSs that are received.
Link-layer address	Link-layer address of the interface.
Physical MTU	Link MTU of the interface.
!M   M	!M indicates the managed-config-flag bit in the RA is not set. M: Conversely
!O   O	!O indicates the other-config-flag bit in the RA is not set. O: Conversely

Description of the fields of the prefix list in ra-info:

Field	Meaning
total	The number of the prefixes of the interface.
fec0:1:1:1::/64	A specific prefix.
Def	Indicate that the interfaces use the default prefix.
Auto   CFG	Auto: Indicate the prefix is automatically generated after the interface is configured with the corresponding IPv6 address. CFG: Indicate that the prefix is manually configured.
!Adv	Indicate that the prefix will not be advertised.
vltime	Valid lifetime of the prefix, measured in seconds.
pltime	Preferred lifetime of the prefix, measured in seconds.
L   !L	L: Indicate that the on-link in the prefix is set. !L: Indicate that the on-link in the prefix is not set.

A | !A

A: Indicate that the auto-configure in the prefix is set. !A: It indicates that the auto-configure in the prefix is not set.

```
QTECH#show ipv6 interface brief
GigabitEthernet 0/1    [down/down]
    2222::2
FE80::1614:4BFF:FE5C:ED3A
```

The following example displays the brief information of the IPv6 interface.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 3.35. show ipv6 neighbors

Use this command to display the IPv6 neighbors.

```
show ipv6 neighbors [ vrf vrf-name ] [ verbose ] [ interface-id ] [ ipv6-address ] [ static ] [ oob ]
```

### Parameter Description

Parameter	Description
verbose	Displays the neighbor details.
static	Displays the validity status of static neighbors.
<i>vrf-name</i>	VRF name
<i>interface-id</i>	Displays the neighbors of the specified interface.
<i>ipv6-address</i>	Displays the neighbors of the specified IPv6 address.
oob	Displays the IPv6 neighbors of the MGMT port.

Defaults

N/A

## Command Mode

Privileged EXEC mode.

## Usage Guide

N/A

## Configuration Examples

The following example displays the neighbors on the SVI 1 interface.

```
QTECH# show ipv6 neighbors vlan 1 IPv6 Address
Linklayer Addr Interface fa::1 00d0.0000.0002 vlan
1
fe80::200:ff:fe00:2 00d0.0000.0002 vlan 1
```

```
QTECH# show ipv6 neighbors verbose IPv6 Address
Linklayer Addr Interface 2001::1 00d0.f800.0001
vlan 1
State: Reach/H Age: - asked: 0
fe80::200:ff:fe00:1 00d0.f800.0001 vlan 1 State:
Reach/H Age: - asked: 0
```

The following example displays the neighbor details.

Field	Meaning
IPv6 Address	IPv6 address of the Neighbor
Linklayer Addr	Link address, namely, MAC address. If it is not available, incomplete is displayed.
Interface	Interface the neighbor locates.
State	State of the neighbor: state/H(R)

	<p>The values of STATE are as below:</p> <p>INCMP (Incomplete): The address resolution of the neighbor is underway, the NS is sent, but the NA is not received.</p> <p>REACH (Reachable): The switch is connected with the neighbor. In this state, the switch takes no additional action when sending packets to the neighbor.</p> <p>STALE: The reachable time of the neighbor expires. In this state, the switch takes no additional action; it only starts NUD (Neighbor Unreachability Detection) after a packet is sent to the neighbor.</p> <p>DELAY: A packet is sent to the neighbor in STALE state. If the STALE state changes to DELAY, DELAY will be changed to PROBE if no neighbor reachability notification is received within DELAY_FIRST_PROBE_TIME seconds (5s), the NS will be sent to the neighbor to start NUD.</p> <p>PROBE: The NUD is started to check the reachability of the neighbor. The NS packets are sent to the neighbor at the interval of RetransTimer milliseconds until the response from the neighbor is received or the number of the sent NSs hits MAX_UNICAST_SOLICIT(3).</p> <p>?: Unknown state.</p> <p>/R—indicate the neighbor is considered as a device</p> <p>/H: The neighbor is a host.</p>
Age	<p>The reachable time of the neighbor. '-' indicates that the neighbor is always reachable. Note that the reachability of a static neighbor depends on the actual situation. 'expired' indicates that the lifetime of the neighbor expires, and the neighbor is waits for the triggering of NUD.</p>
Asked	<p>The number of the NSs that are sent to the neighbor for the resolution of the link address of the neighbor.</p>

```

QTECH# show ipv6 neighbors static
IPv6 Address      Linklayer Addr  Interface          State 2001:1::1
                  00d0.f822.33ab  GigabitEthernet 0/14  ACTIVE 2001:2::2
                  00d0.f822.33ac  VLAN 1            INACTIVE

```

The following example displays the status of static neighbors.

### Related Commands

Command	Description
ipv6 neighbor	Configures a neighbor.

Platform Description

N/A

### 3.36. show ipv6 neighbors statistics

Use the following commands to display the statistics of one IPv6 neighbors.

show ipv6 neighbors [ vrf *vrf-name* ] statistics

Parameter Description

Parameter	Description
<i>vrf-name</i>	VRF name

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

#### Configuration Examples

The following example displays the statistics of the global neighbors.

```
QTECH#show ipv6 neighbor statistics
```

```
Memory: 0 bytes
```

```
Entries: 0
```

```
Static: 0,Dynamic: 0,Local: 0
```

```
Incomplete:0, Reachable:0, Stale:0, Delay:0, Probe:0 QTECH#
```

#### Related Commands

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

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

#### Platform Description

Supported on all platforms.

### 3.37. show ipv6 neighobr statistics per-mac

Use this command to display the number of neighbor entries of every MAC address.

show ipv6 neighbor statistics per-mac [*interface-name*] [*mac-address*]

#### Parameter Description

Parameter	Description
<i>interface-name</i>	Interface ID
<i>mac-address</i>	MAC address

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide      N/A

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example displays the number of neighbor entries of every MAC address..

```
QTECH# show ipv6 neighbor statistics per-
mac
```

```
Interface  MAC address  Statistics
```

```
VLAN 0000:0000:00 3
1 01
```

```
VLAN 0000:0000:00 5
```



```

1      02

VLAN  0000:0000:00  10
2      03

```

Field	Description
Interface	Interface ID.
MAC address	MAC address.
Statistics	ND entry number.

Command	Description
N/A	N/A

N/A

### 3.38. show ipv6 packet statistics

Use this command to display the statistics of IPv6 packets.

show ipv6 packet statistics [ total | *interface-name* ]

#### Parameter Description

Parameter	Description
total	Displays total statistics of all interfaces.
<i>interface-name</i>	Interface name

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

N/A

## Configuration Examples

The following example displays the total statistics of the Ipv6 packets and the statistics of each interface.

```
QTECH#show ipv6 pack statistics Total
Received 0 packets, 0 bytes Unicast:0,Multicast:0 Discards:0
HdrErrors:0 (HoplimitExceeded:0,Others:0)

NoRoutes:0 Others:0
Sent 0 packets, 0 bytes Unicast:0,Multicast:0
GigabitEthernet 0/5 Received 0 packets, 0 bytes
Unicast:0,Multicast:0 Discards:0
HdrErrors:0 (HoplimitExceeded:0,Others:0) NoRoutes:0
Others:0
Sent 0 packets, 0 bytes Unicast:0,Multicast:0
QTECH#
```

```
QTECH#show ipv6 pack statistics total Total
Received 0 packets, 0 bytes Unicast:0,Multicast:0 Discards:0
HdrErrors:0 (HoplimitExceeded:0,Others:0) NoRoutes:0
Others:0
Sent 0 packets, 0 bytes Unicast:0,Multicast:0
QTECH#
```

The following example displays the total statistics of the Ipv6 packets.

## Related Commands

Command	Description
N/A	N/A

Platform Description

Supported on all platforms.

### 3.39. show ipv6 raw-socket

Use this command to display all original IPv6 sockets.

show ipv6 raw-socket [num]

**Parameter Description**

Parameter	Description
<i>num</i>	Protocol number

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode.

**Usage Guide**

N/A

**Configuration Examples**

```
QTECH# show ipv6 raw-socket Number Protocol Process name
ICMPv6      vrrp.elf
ICMPv6      tcpip.elf
VRRP vrrp.elf Total: 3
```

Field	Description
Number	Number.
Process name	Process name.
Protocol	Protocol number
Total	Total number of sockets.

**Related Commands**

Command	Description
N/A	N/A

**Platform Description**

The following example displays all original IPv6 sockets.

N/A

### 3.40. show ipv6 routers

In the IPv6 network, some neighbor routers send out the advertisement messages. Use this command to display the neighbor routers and the advertisement.

**show ipv6 routers** [ *interface-type interface-number* ]

Parameter Description

Parameter	Description							
<i>interface-type</i> <i>interface-number</i>	(Optional) interface.	Displays	the	routing	advertisement	of	the	specified

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

Use this command to display the neighbor routers and the routing advertisement. If no interface is specified, all the routing advertisement of this device will be displayed.

#### Configuration Examples

The following example displays the IPv6 router

```
QTECH# show ipv6 routers
Router FE80::2D0:F8FF:FEC1:C6E1 on VLAN 2, last update 62 sec Hops 64, Lifetime
 1800 sec, ManagedFlag=0, OtherFlag=0, MTU=1500 Preference=MEDIUM
Reachable time 0 msec, Retransmit time 0 msec Prefix
6001:3::/64 onlink autoconfig
  Valid lifetime 2592000 sec, preferred lifetime 604800 sec Prefix
6001:2::/64 onlink autoconfig
Valid lifetime 2592000 sec, preferred lifetime 604800 sec
```

#### Related Commands

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

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

### Platform Description

N/A

### 3.41. show ipv6 sockets

Use this command to display all IPv6 sockets.

show ipv6 sockets

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode.

### Usage Guide

N/A

### Configuration Examples

```
QTECH# show ipv6 sockets
```

```
Number Process name      Type      Protocol LocalIP:Port ForeignIP:Port State
```

The following example displays all IPv6 sockets.

1	vrrp.elf	RAW	ICMPv6	:::58	:::0	*
2	tcpip.elf	RAW	ICMPv6	:::58	:::0	*
3	vrrp.elf	RAW	VRRP	:::112	:::0	*
4	rg-snmpd	DGR AM	UDP	:::161	:::0	*
5	rg-snmpd	DGR AM	UDP	:::162	:::0	*

6	dhcp6.elf	DGR AM	UDP	:::547	:::0	*
7	rg-sshd	STREAM	TCP	:::22	:::0	LISTEN
8	rg-telnetd	STREAM	TCP	:::23	:::0	LISTEN

Total: 8	
Field	Description
Number	Number.
Process name	Process name.
Type	Socket type. RAW indicates the raw socket. DGRAM indicates data packet type. STREAM indicates traffic type.
Protocol	Protocol number
LocalIP:Port	Local IPv6 address and port.
ForeignIP:Port	Peer IPv6 address and port.
State	State (for IPv6 TCP sockets).
Total	Total number of sockets.

#### Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A

### 3.42. show ipv6 udp

Use this command to display all IPv6 UDP sockets. **show ipv6 udp [ local-port num ] [ peer-port num ]** Use this command to display IPv6 UDP socket statistics. **show ipv6 udp statistics**

### Parameter Description

Parameter	Description
local-port <i>num</i>	Local port number.
peer-port <i>num</i>	Peer port number.

Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH# show ipv6 udp
Number Local Address   Peer Address   Process name
  :::161                :::0           rg-snmpd
  :::162                :::0           rg-snmpd
  3:::547               :::0           dhcp6.elf
```

The following example displays all IPv6 UDP sockets.

Filed	Description
Number	Number.
Local Address	Local IPv6 address and port.
Peer Address	Peer IPv6 address and port.
Process name	Process name.

### Related Commands

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

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

**Platform Description**

N/A



## 4. DHCP COMMANDS

### 4.1. address range

Use this command to specify the network segment range of the addresses that can be allocated by CLASS associated with DHCP address pool. Use the **no** form of this command to restore the default setting.

**address range** *low-ip-address high-ip-address*

no address range

#### Parameter Description

Parameter	Description
<i>low-ip-address</i>	Start address in the network segment range.
<i>high-ip-address</i>	End address in the network segment range.

**Defaults** By default, the associated CLASS is not configured with the network segment range. The default is the address pool range.

#### Command Mode

Address pool CLASS configuration mode.

**Usage Guide** Each CLASS corresponds to one network range which must be from low address to high address, so as to allow the duplication of network segment range between multiple CLASSES. If the CLASS associated with the address pool is specified without configuring the corresponding network segment range, the default network segment range of this CLASS is same as the range of the address pool where this CLASS is.

#### Configuration Examples

```
QTECH(config)# ip dhcp pool mypool0 QTECH(dhcp-
config)# class class1
QTECH (config-dhcp-pool-class)# address range 172.16.1.1 172.16.1.8
```

The following example configures the network segment of class1 associated with address pool mypool0 ranging from 172.16.1.1 to 172.16.1.8.

#### Related Commands

Command	Description
	Defines the name of the DHCP address pool and enters the DHCP



ip dhcp pool	address pool configuration mode.
class	Configures the CLASS associated with the DHCP address pool and enters the address pool CLASS configuration mode.

### Platform Description

N/A

## 4.2. address-manage

Use this command to enter the AM rule configuration mode.

address-manage

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Global configuration mode

### Usage Guide

This command is configured on the DHCP server and used in combination with Super VLAN.

### Configuration Examples

### Related Commands

### Platform Description

The following example enters the AM rule configuration mode.

```
QTECH(config)#address-manage
```



Command	Description
N/A	N/A

N/A

### 4.3. bootfile

Use this command to define the startup mapping file name of the DHCP client. Use the `no` or `default`

form of this command to restore the default setting.

`bootfile file-name no bootfile default bootfile`

#### Parameter Description

Parameter	Description
<i>file-name</i>	Startup file name.

#### Defaults

No startup file name is defined by default.

#### Command Mode

DHCP address pool configuration mode

#### Usage Guide

Some DHCP clients need to download the operating system and configure the file during the startup. The DHCP server should provide the mapping file name required for the startup, so that DHCP clients can download the file from the corresponding server (such as TFTP). Other servers are defined by the `next-server` command.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example defines the `device.conf` as the startup file name.

```
bootfile device.conf
```

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enter the DHCP address pool configuration mode.
next-server	Configures the next server IP address of the DHCP client startup process.

N/A

## 4.4. class

### Parameter Description

Use this command to configure the associated CLASS in the DHCP address pool. Use the **no** form of this command to restore the default setting.

**class** *class-name*

no class

Parameter	Description
<i>class-name</i>	Class name, which can be the character string or numeric such as myclass or 1.

### Defaults

By default, no CLASS is associated with the address pool.

### Command Mode

DHCP address pool configuration mode

### Usage Guide

Each DHCP address pool performs the address assignment according to the Option82 matching information. We can divide this Option82 information into classes and specify the available network segment range for these classes in the DHCP address pool. These classes are called CLASS. One DHCP address pool can map to multiple CLASSES, and each CLASS can specify different network segment range.

During the address assignment, firstly, ensure the assignable address pool through the network segment where the client is, then according to the Option82 information further ensure the CLASS and assign the IP address from the network segment range corresponding to the CLASS. If one request packet matches multiple CLASSES in the address pool, perform the address assignment according to the sequencing of configuring the CLASS in the address pool. If this CLASS's assigned addresses have been to the upper limit, then continue to assign the address from the next CLASS, and so on. Each

CLASS corresponds to one network segment range that must be from low addresses to high addresses and the duplicated network ranges between multiple CLASSES are allowed. If the CLASS corresponding to the address pool is specified and the network segment corresponding to the CLASS is not configured, this CLASS's default network segment range is same

as the range of address pool where the CLASS is.

### Configuration Examples

The following example configures the address *mypool0* to associate with class1.

```
QTECH(config)# ip dhcp pool mypool0
QTECH(dhcp-config)# class class1
```

### Related Commands

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

### Platform Description

N/A

## 4.5. clear ip dhcp binding

Use this command to clear the DHCP binding table in the privileged user mode.

```
clear ip dhcp binding { * | ip-address }
```

### Parameter Description

Parameter	Description
*	Deletes all DHCP bindings.
<i>ip-address</i>	Deletes the binding of the specified IP addresses.

### Defaults

N/A.

### Command Mode

Privileged EXEC mode.



## Usage Guide

This command can only clear the automatic DHCP binding, but the manual DHCP binding can be deleted by the `no ip dhcp pool` command.

## Configuration Examples

### Related Commands

### Platform Description

The following example clears the DHCP binding with the IP address 192.168.12.100.

```
clear ip dhcp binding 192.168.12.100
```

Command	Description
show ip dhcp binding	Displays the address binding of the DHCP server.

N/A

## 4.6. clear ip dhcp conflict

Use this command to clear the DHCP address conflict record.

```
clear ip dhcp conflict { * | ip-address }
```

### Parameter Description

Parameter	Description
*	Deletes all DHCP address conflict records.
<i>ip-address</i>	Deletes the conflict record of the specified IP addresses.

### Defaults

N/A.

### Command Mode

Privileged EXEC mode.

Usage Guide The DHCP server uses the ping session to detect the address conflict, while the DHCP client uses the address resolution protocol (ARP) to detect the address conflict. The clear ip dhcp conflict command can be used to delete the history conflict record.

## Configuration Examples

### Related Commands

### Platform Description

The following example clears all address conflict records.

```
clear ip dhcp conflict *
```

Command	Description
ip dhcp ping packets	Defines the number of the data packets sent by the ping operation for the detection of the address conflict when the DHCP server assigns an IP address.
show ip dhcp conflict	Displays the address conflict that the DHCP server detects when it assigns an IP address.

N/A

## 4.7. clear ip dhcp history

Use this command to clear the address assigned by the DHCP server.

```
clear ip dhcp history{ * | mac-address }
```

### Parameter

Parameter	Description
*	Clears all addresses assigned by the DHCP server.
mac-address	Clears the address assigned by the DHCP server corresponding to the specified MAC address.

### Description



**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

This command is configured on the DHCP server.

**Configuration Examples****Related Commands**

**Platform** The following example clears all addresses assigned by the DHCP server.

**Description**

```
QTECH# clear ip dhcp history *
```

Command	Description
N/A	N/A

N/A

**4.8. clear ip dhcp server detect**

Use this command to clear statistics about the fake DHCP server.

```
clear ip dhcp server detect { * | ip-address }
```

**Parameter Description**

Parameter	Description
*	Clears statistics about all fake DHCP servers.
<i>ip-address</i>	Clears statistics about the specified fake DHCP server.

**Defaults**

N/A



## Command Mode

### Privileged EXEC mode

Usage Guide The detected fake DHCP server addresses are saved on the server. You can use the `clear ip dhcp server detect` command to clear statistics about the fake DHCP server.

## Configuration Examples

### Related Commands

### Platform Description

The following example clears statistics about all fake DHCP servers.

```
QTECH#clear ip dhcp server detect *
```

Command	Description
N/A	N/A

N/A

## 4.9. clear ip dhcp server rate

Use this command to clear statistics about the packet processing rate of every module.

```
clear ip dhcp server rate
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

## Command Mode



## Usage Guide

This command is used to clear statistics about the packet processing rate of every module, including arp, hot backup, lsm, and socket.

## Configuration Examples

## Related Commands

## Platform Description

The following example clears statistics about the packet processing rate of every module.

```
QTECH# clear ip dhcp server rate
```

Command	Description
N/A	N/A

N/A

## 4.10. clear ip dhcp server statistics

Use this command to reset the counter of the DHCP server in the privileged user mode.

```
clear ip dhcp server statistics
```

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

N/A

## Command Mode

Privileged EXEC mode.

**Usage Guide** The DHCP server carries out the statistics counter, records the DHCP address pool, automatic binding, manual binding and expired binding. Furthermore, it also carries out the statistics to the number of sent and received DHCP messages. The `clear ip dhcp server statistics` command can be used to delete the history counter record and carry out the statistics starting from scratch.

## Configuration Examples

### Related Commands

Command	Description
<code>show ip dhcp server statistics</code>	Displays the statistics record of the DHCP server.

The following example clears the statistics record of the DHCP server.

```
clear ip dhcp server statistics
```

### Platform

N/A

### Description

#### 4.11. clear ip dhcp relay statistics

Use this command to clear the DHCP relay statistics.

```
clear ip dhcp relay statistics
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

The

DHCP relay is configured with the counter to count various packets received or transmitted by the relay. This command is used to clear the counters.

## Configuration Examples

### Related Commands

### Platform Description

The following example clears the DHCP relay statistics.

```
QTECH# clear ip dhcp relay statistics
```

Command	Description
N/A	N/A

N/A

## 4.12. client-identifier

Use this command to define the unique ID of the DHCP client (indicated in hex, separated by dot) in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting.

*client-identifier unique-identifier*

no client-identifier default client-identifier

### Parameter Description

Parameter	Description
<i>unique-identifier</i>	The DHCP client ID is indicated in hex and separated by dot, for instance, 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726 e.6574.302f.31.

### Defaults

N/A.

**Command** DHCP address pool configuration mode.

Mode

Usage Guide When some DHCP clients request the DHCP server to assign IP addresses, they use their client IDs rather than their hardware addresses. The client ID consists of media type, MAC addresses and interface name. For instance, the MAC address is 00d0.f822.33b4, the interface name is GigabitEthernet 0/1, and the corresponding client ID is 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31, where, 01 denotes the type of the Ethernet media.

The 67.6967.6162.6974.4574.6865.726e.6574.302f.31 is the hex code of GigabitEthernet0/1. For the definition of the media code, refer to the Address Resolution Protocol Parameters section in RFC1700. This command is used only when the DHCP is defined by manual binding.

### Configuration Examples

The following example defines the client ID of the Ethernet DHCP client whose MAC address is 00d0.f822.33b4.

```
client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31
```

### Related Commands

Command	Description
hardware-address	Defines the hardware address of DHCP client.
host	Defines the IP address and network mask, which is used to configure the DHCP manual binding.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

### Platform Description

N/A

### 4.13. client-name

Use this command to define the name of the DHCP client in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting.

**client-name** client-name

**no client-name default client-name****Parameter Description**

Parameter	Description
client-name	Name of DHCP client, a set of standards-based ASCII characters. The name should not include the suffix domain name. For instance, you can define the name of the DHCP client as river, not river.i-net.com.cn.

**Defaults**

No client name is defined by default.

**Command Mode**

DHCP address pool configuration mode.

**Usage Guide**

This command can be used to define the name of the DHCP client only when the DHCP is defined by manual binding. This name should not include the suffix domain name.

**Configuration Examples**

The following example defines a string river as the name of the client.

```
QTECH(dhcp-config)# client-name river
```

**Related Commands**

Command	Description
host	Defines the IP address and network mask, which is used to configure the DHCP manual binding.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

**Platform Description**

N/A

## 4.14. default-router

Use this command to define the default gateway of the DHCP client in the DHCP address pool configuration mode. Use the **no** or **default** form of this command to restore the default setting. **default-router** *ip-address* [ *ip-address2...ip-address8* ]

no default-router default default-router

### Parameter Description

Parameter	Description
<i>ip-address</i>	Defines the IP address of the equipment. It is required to configure one IP address at least.
<i>ip-address2...ip-address8</i>	(Optional) Up to 8 gateways can be configured.

### Defaults

No gateway is defined by default.

### Command Mode

DHCP address pool configuration mode.

### Usage Guide

In general, the DHCP client should get the information of the default gateway from the DHCP server. The DHCP server should specify one gateway address for the client at least, and this address should be of the same network segment as the address assigned to the client.

### Configuration Examples

The following example defines 192.168.12.1 as the default gateway.

```
default-router 192.168.12.1
```

### Related Commands

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

### Platform Description

N/A

### 4.15. dns-server

Use this command to define the DNS server of the DHCP client in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting.

```
dns-server { ip-address [ ip-address2...ip-address8 ]
```

```
no dns-server default dns-server
```

#### Parameter Description

Parameter	Description
<i>ip-address</i>	Defines the IP address of the DNS server. At least one IP address should be configured.
<i>ip-address2...ip-address8</i>	(Optional) Up to 8 DNS servers can be configured.

#### Defaults

No DNS server is defined by default.

#### Command Mode

DHCP address pool configuration mode.

#### Usage Guide

When more than one DNS server is defined, the former will possess higher priority, so the DHCP client will select the next DNS server only when its communication with the former DNS server fails.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example specifies the DNS server 192.168.12.3 for the DHCP client.

```
QTECH(dhcp-config)# dns-server 192.168.12.3
```

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





domain-name	Defines the suffix domain name of the DHCP client.
ip address dhcp	Enables the DHCP client on the interface to obtain the IP address information.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

N/A

## 4.16. domain-name

Use this command to define the suffix domain name of the DHCP client in the DHCP address pool

### Parameter Description

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

**domain-name** *domain-name*

no domain-name default domain-name

Parameter	Description
<i>domain-name</i>	Defines the suffix domain name string of the DHCP client.

### Defaults

No suffix domain name by default.

### Command Mode

DHCP address pool configuration mode.

### Usage Guide

After the DHCP client obtains specified suffix domain name, it can access a host with the same suffix domain name by the host name directly.

### Configuration Examples

**Related Commands****Platform Description**

The following example defines the suffix domain name i-net.com.cn for the DHCP client.

```
QTECH(dhcp-config) #domain-name QTECH.com.cn
```

Command	Description
dns-server	Defines the DNS server of the DHCP client.
ip dhcp pool	Defines the name of the DHCP address pool and enter the DHCP address pool configuration mode.

N/A

**4.17. force-no-router**

Use this command to cancel gateway allocation to the client. Use the **no** or **default** form of this command to restore the default setting.

```
force-no-router no force-no-router
```

```
default force-no-router
```

**Parameter Description**

Parameter	Description
N/A	N/A

**Defaults**

This function is disabled by default.

**Command Mode**

DHCP address pool configuration mode

**Usage Guide**      N/A

**Configuration Examples**

## Related Commands

### Platform Description

The following example cancels gateway allocation to the client.

```
QTECH(dhcp-config) # force-no-router
```

Command	Description
N/A	N/A

N/A

### 4.18. hardware-address

Use this command to define the hardware address of the DHCP client in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting. `hardware-address hardware-address [ type ]`

`no hardware-address default hardware-address`

#### Parameter Description

Parameter	Description
<i>hardware-address</i>	Define the MAC address of the DHCP client.
<i>type</i>	To indicate the hardware platform protocol of the DHCP client, use the string definition or digits definition. String option: Ethernet ieee802 Digits option: 1 (10M Ethernet) 6 (IEEE 802)

#### Defaults

No hardware address is defined by default.

If there is no option when the hardware address is defined, it is the Ethernet by default.

#### Command Mode

DHCP address pool configuration mode.

**Usage Guide** This command can be used only when the DHCP is defined by manual binding.

### Configuration Examples

### Related Commands

Command	Description
<b>client-identifier</b>	Defines the unique ID of the DHCP client (Indicated by the hexadecimal numeral, separated by dot).
<b>host</b>	Defines the IP address and network mask, which is used to configure the DHCP manual binding.
<b>ip dhcp pool</b>	Defines the name of the DHCP address pool and enter the DHCP address pool configuration mode.
<b>default-router</b>	Defines the default route of the DHCP client.

The following example defines the MAC address 00d0.f838.bf3d with the type ethernet.

```
hardware-address 00d0.f838.bf3d
```

### Platform Description

N/A

## 4.19. host

Parameter	Description
<i>ip-address</i>	Defines the IP address of DHCP client.
<i>netmask</i>	Defines the network mask of DHCP client.

### Parameter Description

Use this command to define the IP address and network mask of the DHCP client host in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting.

```
host ip-address [ netmask ]
```

## Defaults

No IP address or network mask of the host is defined.

## Command Mode

DHCP address pool configuration mode.

**Usage Guide** If the network mask is not defined definitely, the DHCP server will use the natural network mask of this IP address: 255.0.0.0 for class A IP address, 255.255.0 for class B IP address, and 255.255.255.0 for class C IP address.

This command can be used only when the DHCP is defined by manual binding.

## Configuration Examples

### Related Commands

Command	Description
client-identifier	Defines the unique ID of the DHCP client (Indicated in hex and separated by dot).
hardware-address	Defines the hardware address of DHCP client.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.
Define the default route of the DHCP client.	default-router

The following example sets the client IP address as 192.168.12.91, and the network mask as 255.255.255.240.

```
host 192.168.12.91 255.255.255.240  
default-router
```

## Platform Description

N/A

## 4.20. ip address dhcp

Use this command to make the Ethernet interface or the PPP, HDLC and FR encapsulated interface obtain the IP address information by the DHCP in the interface configuration mode. Use the **no** or **default** form of this command to restore the default setting.

```
ip address dhcp
```

```
no ip address dhcp default ip address dhcp
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

The interface cannot obtain the IP address by the DHCP by default.

### Command Mode

Interface configuration mode.

### Usage Guide

When requesting the IP address, the DHCP client of the RGOS software also requires the DHCP server provide 5 configuration parameter information: 1) DHCP option 1, client subnet mask, 2) DHCP option 3, it is the same as the gateway information of the same subnet, 3) DHCP option 6, the DNS server information, 4) DHCP option 15, the host suffix domain name, and 5) DHCP option 44, the WINS server information (optional).

The client of the RGOS software is allowed to obtain the address on the PPP, FR or HDL link by the DHCP, which should be supported by the server. At present, our server can support this function.

### Configuration Examples

The following example makes the FastEthernet 0 port obtain the IP address automatically.

```
QTECH(config)# interface GigabitEthernet 0/1
QTECH(config-if-GigabitEthernet 0/1) ip address dhcp
```

### Related Commands

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

dns-server	Defines the DNS server of DHCP client.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

### Platform Description

N/A

## 4.21. ip dhcp arp-probe

Use this command to check ARP entries of the local host to prevent IP address conflict of an STA configured with a static IP address. Use the **no** form of this command to disable the function. Use the **default** form of this command to restore the default setting.

ip dhcp arp-probe no ip dhcp arp-probe

**default ip dhcp arp-probe**

### Parameter Description

Parameter	Description
N/A	N/A

**Defaults** The ARP entry check function is disabled by default.

Command Mode

Global configuration mode

Default Level 14

**Usage Guide** This function is a supplement to the ping conflict detection function. If there is an STA with a static IP address and L2 isolation in the environment and the ping conflict detection function becomes invalid (for example, the firewall is enabled on the STA), an STA that applies for a dynamic address may be assigned with this IP address, resulting in IP conflict.

This function can be enabled only in the preceding scenario. If ARP attack exists, this function cannot be enabled. Otherwise, the DHCP IP address assignment service is affected. As a result, it takes a long time for an STA to apply for an IP address or the STA cannot apply for an IP address.

## Configuration Examples

The following example enables the function in global configuration mode.

```
QTECH(config)# ip dhcp arp-probe
```

**Verification** Run the **show run** command to check whether the configuration is successful.

### 4.22. ip dhcp class

Use this command to define a CLASS and enter the global CLASS configuration mode. Use the **no**

form of this command to restore the default setting.

**ip dhcp class** *class-name*

**no ip dhcp class** *class-name*

#### Parameter Description

Parameter	Description
<i>class-name</i>	Class name, which can be character string or numeric such as myclass or 1.

**Defaults** By default, the class is not configured.

#### Command Mode

Global configuration mode.

**Usage Guide** After executing this command, it enters the global CLASS configuration mode which is shown as “QTECH (config-dhcp-class)#”. In this configuration mode, user can configure the Option82 information that matches the CLASS and the CLASS identification information.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example configures a global CLASS.

```
QTECH(config)# ip dhcp class myclass
```



Command	Description
N/A	N/A

N/A

### 4.23. ip dhcp excluded-address

Use this command to configure excluded IP address. Use the **no** or **default** form of this command to restore the default setting.

**ip dhcp excluded-address** *low-ip-address* [*high-ip-address*]

**no ip dhcp excluded-address** *low-ip-address* [*high-ip-address*]

**default ip dhcp excluded-address** *low-ip-address* [*high-ip-address*]

#### Parameter Description

Parameter	Description
<i>low-ip-address</i>	Indicates a start IP address.
<i>high-ip-address</i>	Indicates an end IP address.

#### Defaults

By default, the DHCP server assigns all IP addresses of the address pool.

#### Command Mode

Global configuration mode.

**Usage Guide** Unless otherwise specified, a DHCP server assigns all the addresses from an IP address pool to DHCP clients. To reserve some addresses(e.g., addresses already assigned to the server or devices), you need to configure these addresses as excluded addresses. To configure a DHCP server, it is recommended to configure excluded addresses to avoid address conflict and shorten detection time during address assignment.

#### Configuration Examples

The following example configures 192.168.12.100~150 as excluded IP address.

```
QTECH(config)#ip dhcp excluded-address 192.168.12.100 192.168.12.150
```

#### Related Commands

## Platform Description

The following example restores the default setting.

```
QTECH (config) #no ip dhcp excluded-address 192.168.12.100
192.168.12.150
```

Command	Description
N/A	N/A

N/A

### 4.24. ip dhcp force-send-nak

Use this command to configure the forcible NAK packet sending function. Use the no or default form of this command to restore the default setting.

```
ip dhcp force-send-nak no ip dhcp force-send-nak
default ip dhcp force-send-nak
```

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

This function is disabled by default.

#### Command Mode

Global configuration mode.

**Usage Guide** The DHCP client checks the previously used IP address every time it is started and sends a DHCPREQUEST packet to continue leasing this IP address. If the address is not available, the DHCP server sends an NAK packet to let the client resend a DHCPDISCOVER packet to apply for a new IP address. If no corresponding lease record can be found on the server, the client keeps sending DHCPDISCOVER packets.

#### Configuration Examples

#### Related Commands

## Platform Description

The following example enables the forcible NAK packet sending function in global configuration mode.

```
QTECH(config)# ip dhcp force-send-nak
```

Command	Description
N/A	N/A

N/A

### 4.25. ip dhcp ping packets

Use this command to configure the times of pinging the IP address when the DHCP server detects address conflict in the global configuration mode. Use the no or default form of this command to restore the default setting.

```
ip dhcp ping packets [ number ] no ip dhcp ping packets default ip dhcp ping packets
```

## Parameter Description

Parameter	Description
<i>number</i>	(Optional) Number of packets in the range of 0 to 10, where 0 indicates disabling the ping operation. The Ping operation sends two packets by default.

## Defaults

The Ping operation sends two packets by default.

## Command Mode

Global configuration mode.

**Usage Guide** When the DHCP server attempts to assign the IP address from the DHCP address pool, use the ping operation to check whether this address is occupied by other hosts. Record it if the address is occupied, otherwise, assign it to the DHCP client. The Ping operation will send up to 10 packets, two packets by default.

## Configuration Examples

## Related Commands

### Platform Description

The following example sets the number of the packets sent by the ping operation as 3.

```
QTECH(config)# ip dhcp ping packets 3
```

Command	Description
clear ip dhcp conflict	Clears the DHCP history conflict record.
ip dhcp ping packet	Configures the timeout time that the DHCP server waits for the Ping response. If all the ping packets are not responded within the specified time, it indicates that this IP address can be assigned. Otherwise, it will record the address conflict.
show ip dhcp conflict	Displays the DHCP server detects address conflict when it assigns an IP address.

N/A

## 4.26. ip dhcp ping timeout

Use this command to configure the timeout that the DHCP server waits for response when it uses the ping operation to detect the address conflict in the global configuration mode. Use the **no** or **default** form of this command to restore the default setting.

### Parameter Description

**ip dhcp ping timeout** *milli-seconds*

no ip dhcp ping timeout default ip dhcp ping timeout

Parameter	Description
<i>milli-seconds</i>	Time that the DHCP server waits for ping response in the range 100 to 10000 milliseconds.

**Defaults** The default is 500 seconds.

Global configuration mode.

### Usage Guide

This command defines the time that the DHCP server waits for a ping response packet.

### Configuration Examples

### Related Commands

### Platform Description

The following example configures the waiting time of the ping response packet to 600ms.

```
ip dhcp ping timeout 600
```

Command	Description
clear ip dhcp conflict	Clears the DHCP history conflict record.
ip dhcp ping packets	Defines the number of the data packets sent by the ping operation for the detection of the address conflict when the DHCP server assigns an IP address.
show ip dhcp conflict	Displays the address conflict the DHCP server detects when it assigns an IP address.

N/A

## 4.27. ip dhcp pool

Use this command to define a name of the DHCP address pool and enter the DHCP address pool configuration mode in the global configuration mode. Use the **no** or **default** form of this command to restore the default setting.

**ip dhcp pool** *pool-name*

**no ip dhcp pool** *pool-name*

**default ip dhcp pool** *pool-name*

### Parameter Description

Parameter	Description
<i>pool-name</i>	A string of characters and positive integers, for instance, mypool or 1.

**Defaults** No DHCP address pool is defined by default.

Command Mode

Global configuration mode.

**Usage Guide** Execute the command to enter the DHCP address pool configuration mode:

```
QTECH(dhcp-config) #
```

In this configuration mode, configure the IP address range, the DNS server and the default gateway.

Configuration Examples

**Related Commands**

**Platform Description**

The following example defines a DHCP address pool named mypool0.

```
QTECH(config)#ip dhcp pool mypool0
```

Command	Description
<b>host</b>	Defines the IP address and network mask, which is used to configure the DHCP manual binding.
<b>ip dhcp excluded-address</b>	Defines the IP addresses that the DHCP server cannot assign to the clients.
<b>network (DHCP)</b>	Defines the network number and network mask of the DHCP address pool.

## 4.28. ip dhcp relay check server-id

Use this command to enable the ip dhcp relay check *server-id* function. Use the no form of this command to restore the default setting.

```
ip dhcp relay check server-id  
no ip dhcp relay check server-id
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

The ip dhcp relay check server-id command is disabled.

### Command Mode

Global configuration mode.

### Usage Guide

Switch will select the server to be sent according to server-id option when forwarding DHCP REQUEST via this command. Without this command configured, the switch forwards the DHCP REQUEST to all configured DHCP servers.

### Configuration Examples

The following example enables the ip dhcp relay check server-id function.

```
QTECH(config)# ip dhcp relay check server-id
```

### Related Commands

### Platform Description

The following example disables the ip-dhcp relay check server-id function.

```
QTECH(config)# no ip dhcp relay check server-id
```

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

service dhcp	Enables the DHCP Relay.
--------------	-------------------------

N/A

### 4.29. ip dhcp relay information option82

Use this command to enable the ip dhcp relay information option82 function. Use the no form of this command to restore the default setting.

```
ip dhcp relay information option82
```

```
no ip dhcp relay information option82
```

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

The ip dhcp relay information option82 command is disabled.

#### Command Mode

Global configuration mode.

#### Usage Guide

This command is exclusive with the option dot1x command.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example enables the option82 function on the DHCP relay.

```
QTECH(config)# Ip dhcp relay information option82
```

The following example disables the option82 function on the DHCP relay.

```
QTECH(config)# no ip dhcp relay information option82
```



Command	Description
service dhcp	Enables the DHCP Relay.

N/A

### 4.30. ip dhcp relay suppression

Use this command to enable the DHCP binding globally. Use the no form of this command to disable the DHCP binding globally and enable the DHCP relay suppression on the port.

#### Parameter Description

ip dhcp relay suppression no ip dhcp relay suppression

Parameter	Description
N/A	N/A

#### Defaults

The ip dhcp relay suppression command is disabled.

#### Command Mode

Interface configuration mode.

#### Usage Guide

After executing this command, the system will not relay the DHCP request message on the interface.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example enables the relay suppression function.

```
QTECH(config-if)# ip dhcp relay suppression
```

The following example enables the relay suppression function.

```
QTECH(config-if)# no ip dhcp relay suppression
```

Command	Description
service dhcp	Enables the DHCP Relay.

N/A

### 4.31. ip dhcp server arp-detect

Use this command to enable the user-offline detection. Use the no or default form this command to restore the default setting.

```
ip dhcp server arp-detect
```

```
no ip dhcp server arp-detect default ip dhcp server arp-detect
```

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

This function is disabled by default.

#### Command Mode

Global configuration mode

#### Usage Guide

This command is used to detect whether the user has gone offline, If the user does not go online within a certain period, the IP address is reclaimed.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example enables the user-offline detection.

```
QTECH(config)# ip dhcp server arp-detect
```

Command	Description
N/A	N/A

N/A

### 4.32. ip dhcp server detect

Use this command to enable the fake DHCP server detection. Use the no or default form of this command to restore the default setting.

ip dhcp server detect

no ip dhcp server detect default ip dhcp server detect

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

This function is disabled by default.

#### Command Mode

Global configuration mode

#### Usage Guide

After this function is enabled, any fake DHCP server detected is logged.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example enables the fake DHCP server detection.

```
QTECH(config)# ip dhcp server detect
```

Command	Description
N/A	N/A



### 4.33. ip dhcp use class

Use this command to enable the CLASS to allocate addresses in the global configuration mode. Use the **no** form of this command can be used to disable the CLASS.

ip dhcp use class

**no ip dhcp use class**

#### Parameter Description

Parameter	Description
N/A	N/A

**Defaults** Enabled

#### Command Mode

This function is enabled by default.

#### Usage Guide

N/A

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example enables the CLASS to allocate addresses.

```
QTECH(config)# ip dhcp use class
```

Command	Description
N/A	N/A

N/A

### 4.34. ip helper-address

Use this command to add an IP address of the DHCP server. Use the no form of this command to delete an IP address of the DHCP server.

The server address can be configured globally or on a specific interface. Therefore, this command can run in the global configuration mode or the interface configuration mode to add the DHCP server information.

```
ip helper-address { cycle-mode | [ vrf {vrf-name}] A.B.C.D } no ip helper-address { cycle-mode | [ vrf {vrf-name}] A.B.C.D }
```

#### Parameter Description

Parameter	Description
cycle-mode	Indicates that DHCP request packets are forwarded to all DHCP servers.
vrf {vrf-name}	Indicates a VPN Routing & Forwarding (VRF) name.
A.B.C.D	Indicates the IP address of a DHCP server.

#### Defaults

N/A

#### Command Mode

Global configuration mode, interface configuration mode.

**Usage Guide** DHCP request packets are sent to the DHCP server whose IP address is configured, while DHCP response packets are forwarded to the DHCP client.

Up to 20 DHCP server IP addresses can be configured globally or on a layer-3 interface. When an interface receives a DHCP request packet, the DHCP server configuration on the interface prevails over that configured globally. If the interface is not configured with DHCP server addresses, the global configuration takes effect.

DHCP relay is based on vrf.

In global configuration mode, you can enable cycle-mode. When it is enabled, DHCP request packets are forwarded to all DHCP servers. If it is not enabled, DHCP request packets are sent to the first DHCP server configured under this rule. This parameter can

only be enabled in global configuration mode and take effect both globally and on interfaces. By default, cycle-mode is enabled.

### Configuration Examples

The following example sets the address for a DHCP server, in the interface vlan 1, to 192.168.11.1.

```
QTECH# configure terminal
Enter configuration commands, one per line. End with CNTL/Z. QTECH(config)# interface vlan
1
QTECH(config-if)# ip helper-address 192.168.11.1
QTECH(config-if)# no ip helper-address 192.168.11.1
```

The following example deletes the configured address of a DHCP server, 192.168.11.1.

```
QTECH# configure terminal
Enter configuration commands, one per line. End with CNTL/Z. QTECH(config)# ip helper-
address 192.168.100.1
```

The following example sets the IP address for the global server to 192.168.100.1.

```
QTECH(config)# no ip helper-address 192.168.100.1
```

The following example deleted the configured IP address for the global server, 192.168.100.1.

```
QTECH(config)# ip helper-address cycle-mode
```

The following example enables DHCP request packets to be forwarded to all servers.

```
QTECH(config)# no ip helper-address cycle-mode
```

The following example disables DHCP request packets to be forwarded to all servers.

### Related

Command	Description
service dhcp	Enables the DHCP relay.

### Commands

### Platform Description

N/A

## 4.35. lease

### Parameter Description

Use this command to define the lease time of the IP address that the DHCP server assigns to the client in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting. A limited lease time ranges from 1 minute to 23 hours and 59 minutes. lease { *days* [ *hours* ] [ *minutes* ] | infinite }

no lease default lease

Parameter	Description
<i>days</i>	Lease time in days
<i>hours</i>	(Optional) Lease time in hours. It is necessary to define the days before defining the hours.
<i>minutes</i>	(Optional) Lease time in minutes. It is necessary to define the days and hours before defining the minutes.
infinite	Infinite lease time.

### Defaults

The lease time for a static address pool is infinite. The lease time for other address pools is 1 day.

### Command Mode

DHCP address pool configuration mode.

### Usage Guide

When the lease is getting near to expire, the DHCP client will send the request of renewal of lease. In general, the DHCP server will allow the renewal of lease of the original IP address.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the DHCP lease to 1 hour.

```
QTECH(dhcp-config)# lease 0 1
```

The following example sets the DHCP lease to 1 minute.

```
QTECH(dhcp-config)# lease 0 0 1
```

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

N/A

### 4.36. lease-threshold

Use this command in DHCP address pool configuration mode to define the DHCP alarm threshold. Use the default or no form of this command to restore the default setting.

lease-threshold *percentage*

#### Parameter Description

default lease-threshold no lease-threshold

Parameter	Description
<i>percentage</i>	Usage of the address pool, ranging from 60 to 100 in percentage.

#### Defaults

90

#### Command Mode

DHCP address pool configuration mode.

Usage Guide If the maximum IP usage of the address pool reaches the threshold, the DHCP Server generates a SYSLOG alarm. The IP usage indicates the ratio of the number of assigned address pools to the total number of assignable address pools. If the number of assigned pools stays above the alarm threshold, an alarm is generated every 5 minutes.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the alarm threshold to 80%.

```
QTECH(dhcp-config)# lease-threshold 80
```



The following example disables the address pool alarm function.

```
QTECH(dhcp-config) # no lease-threshold
```

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

N/A

### 4.37. match ip

Use this command to define an AM matching rule.

Use the no form of this command to remove the configuration. Use the clear form of this command to clear all configurations.

```
match ip ip-address netmask [interface] [add/remove] vlan vlan-list
```

```
no match ip ip-address netmask [interface] [add/remove] vlan vlan-list
```

```
clear match ip [interface]
```

#### Parameter Description

Parameter	Description
<i>ip-address</i>	IP address
<i>netmask</i>	Subnet mask
<i>interface</i>	Interface ID
<i>add/remove</i>	Adds or removes the specified VLAN.

#### Defaults

N/A

#### Command Mode

AM rule configuration mode

Usage Guide With this function enabled, all DHCP clients with specified vlan-list and interface obtain addresses in the rule.

If a DHCP client obtains a static address, it is not subject to AM matching rules in whichever Sub VLAN unless the AM rule configuration is based on VLAN instead of Sub VLAN. This type of matching rules applies to only static addresses.

### Configuration Examples

The following example defines an AM matching rule.

```
QTECH(config-address-manage)#match ip 192.168.11.0 255.255.255.0
GigabitEthernet 0/10 vlan 10
```

### Related Commands

Command	Description
N/A	N/A

## 4.38. match ip default

Use this command to define a default AM matching rule.

Use the no form of this command to remove the configuration,

`match ip default ip-address netmask`

`no match ip default ip-address netmask`

### Parameter Description

Parameter	Description
<i>ip-address</i>	IP address
<i>netmask</i>	Subnet mask

### Defaults

N/A

### Command Mode

AM rule configuration mode

### Usage Guide

With this function enabled, all DHCP clients with specified vlan-list and interface obtain addresses in the default rule.

### Configuration

The following example defines a default AM matching rule.

### Examples

```
QTECH(config-address-manage)#match ip default 192.168.12.0  
255.255.255.0
```

### Related Commands

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



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

### Platform Description

N/A

## 4.39. netbios-name-server

Use this command to configure the WINS name server of the Microsoft DHCP client NETBIOS in the DHCP address pool configuration mode. The no or default form of this command can be used to restore the default setting.

```
netbios-name-server ip-address [ ip-address2...ip-address8 ]
```

```
no netbios-name-server default netbios-name-server
```

### Parameter Description

Parameter	Description
<i>ip-address</i>	IP address of the WINS server. It is required to configure one IP address at least.
<i>ip-address2</i> ... <i>ip-address8</i>	(Optional) IP addresses of WINS servers. Up to 8 WINS servers can be configured.

### Defaults

No WINS server is defined by default.

### Command Mode

DHCP address pool configuration mode.

### Usage Guide

When more than one WINS server is defined, the former has higher priority. The DHCP client will select the next WINS server only when its communication with the former WINS server fails.

### Configuration Examples

### Related Commands

### Platform Description

The following example specifies the WINS server 192.168.12.3 for the DHCP client.

```
netbios-name-server 192.168.12.3
```

Command	Description
ip address dhcp	Enables the DHCP client on the interface to obtain the IP address.
ip dhcp pool	Defines the name of the DHCP address pool and enter the DHCP address pool configuration mode.
netbios-node-type	Defines the netbios node type of the client host.

N/A

#### 4.40. netbios-node-type

Use this command to define the node type of the master NetBIOS of the Microsoft DHCP client in the DHCP address configuration mode. Use the **no** or **default** form of this command to restore the default setting.

```
netbios-node-type type no netbios-node-type default netbios-node-type
```

#### Parameter Description

Parameter	Description
<i>type</i>	Type of node in two modes: Digit in hexadecimal form in the range of 0 to FF. Only the following numerals are available: 1: b-node. 2: p-node. 4: m-node. 8: h-node. String: b-node: broadcast node p-node: peer-to-peer node m-node: mixed node h-node: hybrid node

**Defaults** No type of the NetBIOS node is defined by default.

**Command Mode**

DHCP address pool configuration mode.

**Usage Guide**

There are 4 types of the NetBIOS nodes of the Microsoft DHCP client: 1) Broadcast, which carries out the NetBIOS name resolution by the broadcast method, 2) Peer-to-peer, which directly requests the WINS server to carry out the NetBIOS name resolution, 3) Mixed, which requests the name resolution by the broadcast method firstly, and then carry out the name resolution by the WINS server connection, 4) Hybrid, which requests the WINS server to carry out the NetBIOS name resolution firstly, and it will carry out the NetBIOS name resolution by the broadcast method if the response is not received.

By default, the node type for Microsoft operating system is broadcast or hybrid. If the WINS server is not configured, broadcast node is used. Otherwise, hybrid node is used. It is recommended to set the type of the NetBIOS node as Hybrid.

**Configuration Examples**

The following example sets the NetBIOS node of Microsoft DHCP client as Hybrid.

```
QTECH(dhcp-config) # netbios-node-type h-node
```

**Related Commands**

Command	Description
ip dhcp pool	Defines the name of DHCP address pool and enters the DHCP
	address pool configuration mode.
<b>netbios-name-server</b>	Configures the WINS name server of the Microsoft DHCP client NETBIOS.

## Platform Description

N/A

**4.41. network**

Use this command to define the network number and network mask of the DHCP address pool in the DHCP address pool configuration mode. Use the no or default form of this command to restore the default setting.

```
network net-number net-mask [ low-ip-address high-ip-address ]
```

```
no network default network
```



Parameter	Description
<i>net-number</i>	Network number of the DHCP address pool
<i>net-mask</i>	Network mask of the DHCP address pool. If the network mask is not defined, the natural network mask will be used by default.
<i>low-ip-address</i>	Start IP address.
<i>high-ip-address</i>	End IP address.

### Defaults

No network number or network mask is defined by default.

### Command Mode

DHCP address pool configuration mode.

### Usage Guide

This command defines the subnet and subnet mask of a DHCP address pool, and provides the DHCP server with an address space which can be assigned to the clients. Unless excluded addresses are configured, all the addresses of the DHCP address pool can be assigned to the clients. The DHCP server assigns the addresses in the address pool orderly. If the DHCP server found an IP address is in the DHCP binding table or in the network segment, it checks the next until it assigns an effective IP address.

The `show ip dhcp binding` command can be used to view the address assignment, and the `show ip dhcp conflict` command can be used to view the address conflict detection configuration.

### Configuration Examples

#### Related Commands

The following example defines the network number of the DHCP address pool as 192.168.12.0, and the network mask as 255.255.255.240.

```
network 192.168.12.0 255.255.255.240
```

Command	Description
<code>ip dhcp excluded-</code>	Defines the IP addresses that the DHCP server

address	cannot assign to the
	clients.
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

### Platform Description

N/A

## 4.42. next-server

Use this command to define the startup sever list that the DHCP client accesses during startup in the DHCP address configuration mode. Use the **no** or **default** form of this command to restore the default setting.

**next-server** *ip-address* [ *ip-address2...ip-address8* ]

no next-server default next-server

### Parameter Description

Parameter	Description
<i>ip-address</i>	Defines the IP address of the startup server, which is usually the TFTP server. It is required to configure one IP address at least.
<i>ip-address2...ip-address8</i>	(Optional) Up to 8 startup servers can be configured.

### Defaults

N/A

### Command Mode

DHCP address pool configuration mode.

**Usage Guide** When more than one startup server is defined, the former will possess higher priory. The DHCP client will select the next startup server only when its communication with the former startup server fails.



## Configuration Examples

### Related Commands

### Platform Description

The following example specifies the startup server 192.168.12.4 for the DHCP client.

```
QTECH(dhcp-config) # next-server 192.168.12.4
```

Command	Description
bootfile	Defines the default startup mapping file name of the DHCP client.
ip dhcp pool	Defines the name of the DHCP address pool and enter the DHCP address pool configuration mode.
ip help-address	Defines the Helper address on the interface.
option	Configures the option of the RGOS software DHCP server.

N/A

### 4.43. option

Use this command to configure the option of the DHCP server in the DHCP address pool configuration mode. Use the **no** or **default** form of this command to restore the default setting. **option code { ascii string | hex string | ip ip-address }**

no option default option

### Parameter Description

Parameter	Description
<i>code</i>	Defines the DHCP option codes.
<b>ascii string</b>	Defines an ASCII string.
<b>hex string</b>	Defines a hex string.

<b>ip</b> <i>ip-address</i>	Defines an IP address list.
-----------------------------	-----------------------------

**Defaults** N/A

Command Mode

**Global configuration mode**

**Usage Guide** The DHCP provides a mechanism to transmit the configuration information to the host in the TCP/IP network. The DHCP message has a variable option field that can be defined according to the actual requirement. The DHCP client needs to carry the DHCP message with 32 bytes of option information at least. Furthermore, the fixed data field in the DHCP message is also referred to as an option. For the definition of current DHCP option, refer to RFC 2131.

### Configuration Examples

#### Related Commands

Command	Description
<b>ip dhcp pool</b>	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

The following example defines the option code 19, which determines whether the DHCP client can enable the IP packet forwarding. 0 indicates to disable the IP packet forwarding, and 1 indicates to enable the IP packet forwarding. The configuration below enable the IP packet forwarding on the DHCP client.

```
QTECH(dhcp-config)# option 19 hex 1
```

The following example defines the option code 33, which provides the DHCP client with the static route information. The DHCP client will install two static routes: 1) the destination network 172.16.12.0 and the gateway 192.168.12.12, 2) the destination network 172.16.16.0 and the gateway

192.168.12.16.

```
option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0 192.168.12.16
```

**Platform** N/A

Description

#### 4.44. pool-status

Use this command to enable or disable the DHCP address pool.

```
pool-status { enable | disable }
```

### Parameter Description

Parameter	Description
enable	Enables the address pool.
disable	Disables the address pool.

### Defaults

By default, the address pool is enabled after it is configured.

### Command Mode

DHCP address pool configuration mode

### Usage Guide

This command is configured on the DHCP server.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example disables the address pool.

```
QTECH(dhcp-config)# pool-status disable
```

Command	Description
N/A	N/A

N/A

## 4.45. relay agent information

Use this command to enter the Option82 matching information configuration mode in the global CLASS configuration mode. Use the no form of this command to delete the Option82 matching information of the CLASS.

```
relay agent information
```

```
no relay agent information
```



### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Global CLASS configuration mode

### Usage Guide

After executing this command, it enters the Option82 matching information configuration mode which is shown as “QTECH (config-dhcp-class-relayinfo)#”.

In this configuration mode, user can configure the class matching multiple Option82 information.

### Configuration Examples

The following example configures a global CLASS and enters the Option82 matching information configuration mode.

```
QTECH(config)# ip dhcp class myclass QTECH(config-dhcp-class)#
relay agent information
QTECH(config-dhcp-class-relayinfo)#
```

### Related Commands

Command	Description
ip dhcp class	Defines a CLASS and enters the global CLASS configuration mode.

### Platform Description

N/A

## 4.46. relay-information hex

Use this command to enter the Option82 matching information configuration mode. Use the no form of this command to delete a piece of matching information.

```
relay-information hex aabb.ccdd.eeff... [ * ]
```

```
no relay-information hex aabb.ccdd.eeff... [ * ]
```

### Parameter Description

Parameter	Description
<i>aabb.ccdd.eeff...[*]</i>	Hexadecimal Option82 matching information. The ‘*’ symbol means partial matching which needs the front part matching only. Without the ‘*’ means needing full matching.

### Defaults

N/A

### Command Mode

Global CLASS configuration mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH(config)# ip dhcp class myclass
QTECH(config-dhcp-class)# relay agent
information
QTECH(config-dhcp-class-relayinfo)# relay-
information hex 0102256535
QTECH(config-dhcp-class-relayinfo)# relay-
information hex 010225654565
QTECH(config-dhcp-class-relayinfo)# relay-information
hex 060225654565
```

The following example configures a global CLASS which can match multiple Option82 information.

```
Qtech(config-dhcp-class-relayinfo)# relay-information
hex 060223*
```

### Related Commands

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

ip dhcp class	Defines a CLASS and enter the global CLASS configuration mode.
relay agent information	Enters the Option82 matching information configuration mode.

### Platform Description

N/A

### 4.47. remark

Use this command to configure the identification which is used to describe the CLASS in this global CLASS configuration mode. Use the no form of this command to delete the identification.

remark *class-remark*

no remark

### Parameter Description

Parameter	Description
class-remark	Information used to identify the CLASS, which can be the character strings with space in them.

### Defaults

N/A.

### Command Mode

Global CLASS configuration mode.

### Usage Guide

N/A

### Configuration Examples

The following example configures the identification information for a global CLASS.

```
QTECH(config)# ip dhcp class myclass
QTECH(config-dhcp-class)# remark used in #1 build
```

### Related Commands

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



ip dhcp class	Defines a CLASS and enter the global CLASS configuration mode.
---------------	----------------------------------------------------------------

### Platform Description

N/A

## 4.48. service dhcp

Use this command to enable the DHCP server and the DHCP relay on the device in global configuration mode. Use the no or default form of this command to restore the default setting. service dhcp

### Parameter Description

no service dhcp default service dhcp

Parameter	Description
N/A	N/A

### Defaults

The service dhcp command is disabled.

### Command Mode

Global configuration mode

### Usage Guide

The DHCP server can assign the IP addresses to the clients automatically, and provide them with the network configuration information such as DNS server and default gateway. The DHCP relay can forward the DHCP requests to other servers, and the returned DHCP responses to the DHCP client, serving as the relay for DHCP packets.

### Configuration Examples

#### Related Commands

### Platform Description

The following example enables the DHCP server and the DHCP relay feature.

```
QTECH(config)# service dhcp
```

Command	Description
show ip dhcp server	Displays various statistics information of the



statistics	DHCP server.
ip helper-address [ vrf ] A.B.C.D	Adds an IP address of the DHCP server.

N/A

#### 4.49. show dhcp lease

Use this command to display the lease information of the IP address obtained by the DHCP client.

```
show dhcp lease
```

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

If the IP address is not defined, display the binding condition of all addresses. If the IP address is defined, display the binding condition of this IP address.

#### Configuration Examples

The following example displays the result of the show dhcp lease.

```
QTECH# show dhcp lease
Temp IP addr: 192.168.5.71 for peer on Interface: FastEthernet0/0 Temp sub
net mask: 255.255.255.0
DHCP Lease server: 192.168.5.70, state: 3 Bound DHCP
transaction id: 168F
Lease: 600 secs, Renewal: 300 secs, Rebind: 525 secs Temp
default-gateway addr: 192.168.5.1
Next timer fires after: 00:04:29
Retry count: 0 Client-ID: redgaint-00d0.f8fb.5740-Fa0/0
```

#### Related Commands



Command	Description
N/A	N/A

### Platform Description

N/A

## 4.50. show ip dhcp binding

Use this command to display the binding condition of the DHCP address.

show ip dhcp binding [ *ip-address* ]

### Parameter Description

Parameter	Description
<i>ip-address</i>	(Optional) Only displays the binding condition of the specified IP addresses.

### Defaults

N/A

### Command Mode

Privileged EXEC mode.

### Usage Guide

If the IP address is not defined, show the binding condition of all addresses. If the IP address is defined, show the binding condition of this IP address

### Configuration Examples

```
QTECH# show ip dhcp binding Total number of clients      : 4  Expired
clients          : 3
Running clients   : 1
```

```
IP address      Hardware address      Lease expiration      Type
20.1.1.1       2000.0000.2011      000 days 23 hours 59 mins  Automatic
```

The following is the result of the show ip dhcp binding.

The meaning of various fields in the show result is described as follows.

Field	Description
IP address	The IP address to be assigned to the DHCP client.
Client-Identifier /Hardware address	The client identifier or hardware address of the DHCP client.
Lease expiration	The expiration date of the lease. The Infinite indicates it is not limited by the time. The IDLE indicates the address is in the free status currently for it is not renewed or the DHCP client releases it actively.
Type	The type of the address binding. The Automatic indicates an IP address is assigned automatically, and the Manual indicates an IP address is assigned by manual.

#### Related Commands

Command	Description
clear ip dhcp binding	Clears the DHCP address binding table.

#### Platform Description

N/A

### 4.51. show ip dhcp conflict

Use this command to show the conflict history record of the DHCP sever.

```
show ip dhcp conflict
```

#### Parameter Description

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

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

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode.

**Usage Guide**

This command can display the conflict address list detected by the DHCP server.

**Configuration Examples**

The following example displays the output result of the show ip dhcp conflict command.

```
QTECH# show ip dhcp conflict
IP address Detection Method 192.168.12.1
Ping
```

The meaning of various fields in the show result is described as follows.

Field	Description
IP address	The IP addresses which cannot be assigned to the DHCP client.
Detection Method	The conflict detection method.

**Related Commands**

Command	Description
clear ip dhcp conflict	Clears the DHCP conflict record.

**Platform Description**

N/A

**4.52. show ip dhcp database**

Use this command to display backup status of DHCP database.

```
show ip dhcp database
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode.

### Usage Guide

This command is configured on the DHCP server. Run this command to display information about the DHCP database.

### Configuration Examples

The following example displays status of the DHCP database..

```
QTECH#show ip dhcp database
Enable      No
Status      ready
Save File   Default
Successss   0
Failures    0
```

The meaning of various fields in the show result is described as follows.

Field	Description
Enable	The status of the database.
Status	The status of data recovery.
Save File	The path where data is saved.
Successss	The times of successful data saving.

Failures	The times of failed data saving.
Interval Time	The interval time for data saving.

### Related Commands

N/A

### Platform Description

N/A

## 4.53. show ip dhcp history

Use this command to display the DHCP lease history.

```
show ip dhcp history
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command is configured on the DHCP server.

### Configuration Examples

The following example displays the DHCP lease history.

### Related Commands

```
QTECH#show ip dhcp history : 3
Hardware address Lease expiration IDLE Vlan/Relay
IDLE 4097
```

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```
Expired clients IP          2222.abcd.47ac 2222.abcd.47ae  IDLE          4097
address 10.1.1.5           2222.abcd.47ad
10.1.1.4                   : 0
10.1.1.3
Running clients
```

Command	Description
N/A	N/A

#### Platform Description

N/A

### 4.54. show ip dhcp identifier

Use this command to display the DHCP address pool ID and address usage.

show ip dhcp identifier

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

N/A

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example displays the DHCP address pool ID and address usage.

```
QTECH# show ip dhcp identifier
Pool name   Identifier      Total      Distributed  Remained
-----
wwp         597455782     65533     0            65533
```

Pool name	Address pool name.
Identifier	Address pool ID.
Total	Total number of addresses.
Distributed	Number of allocated addresses.
Remained	Number of remained addresses.

Command	Description
N/A	N/A

N/A

#### 4.55. show ip dhcp pool

Use this command to display the address statistics of an address pool.

```
show ip dhcp pool [ poolname ]
```

##### Parameter Description

Parameter	Description
<i>poolname</i>	(Optional) Address pool whose address statistics are to be displayed.

##### Defaults

Privileged EXEC mode.

##### Command Mode

N/A

## Usage Guide

Use this command to show the address statistics of an address pool.

## Configuration Examples

## Related Commands

## Platform Description

The following example displays the output result of the `show ip dhcp pool poolname` command.

```
QTECH# show ip dhcp pool QTECH#sh ip dh pool
Pool name      Total Distributed  Remained      Percentage
-----
net20          253      11           242           4.34782
test           0         0            0             0.00000
```

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP address pool configuration mode.

N/A

## 4.56. show ip dhcp relay-statistics

Use this command to display the statistics of the DHCP relay.

```
show ip dhcp relay-statistics
```

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

N/A



**Command Mode**

Privileged EXEC mode

**Usage Guide**

This command is used to display the statistics of the DHCP relay.

**Configuration Examples**

The following example displays the statistics of the DHCP relay.

```
QTECH# show ip dhcp relay-statistics
Cycle mode          0
Message            Count
Discover           0
Offer              0
Request            0
Ack                0
Nak                0
Decline            0
Release            0
Info               0
Bad                0
```

Direction		Count
Rx client		0
Rx client	uni	0
Rx client	bro	0
Tx client		0
Tx client	uni	0
Tx client	bro	0
Rx server		0
Tx server		0

**Related Commands**

Command	Description
N/A	N/A

### Platform Description

N/A

## 4.57. show ip dhcp server detect

Use this command to display the fake DHCP server detected.

```
show ip dhcp server detect
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH#show
ip dhcp
server
detect The
DHCP Server
information:
Server IP = 10.1.10.40, DHCP server interface =
GigabitEthernet 0/1
```

The following example displays the fake DHCP server detected.

### Related Commands

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

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

## Platform Description

N/A

## 4.58. show ip dhcp server statistics

Use this command to display the statistics of the DHCP server.

show ip dhcp server statistics

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

N/A

## Command Mode

Privileged EXEC mode

## Usage Guide

This command displays the statistics of the DHCP server.

## Configuration Examples

```
QTECH# show ip dhcp server statistics Address pools 2
Lease counter          4
Active Lease Counter   0
Expired Lease Counter  4
Malformed messages    0
Dropped messages      0

Message                Received
BOOTREQUEST            216
DHCPDISCOVER           33
DHCPPREQUEST           25
DHCPCDECLINE           0
DHCPRELEASE            1
DHCPIFORM              150
```

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```

Message                Sent
BOOTREPLY              16
DHCPOFFER              9
DHCPACK                7
DHCPNAK                0
DHCPREQTIMES          0
DHCPREQSUCTIMES       0

QTECH# show ip dhcp server statistics Address pools 2
Lease counter          4
Active Lease Counter   0
Expired Lease Counter  4
Malformed messages    0
Dropped messages      0

```

The following example displays the output result of the **show ip dhcp server statistics** command.

### Related Commands

### Platform Description

The meaning of various fields in the show result is described as follows.

Field	Description
Address pools	Number of address pools.
Automatic bindings	Number of automatic address bindings.
Manual bindings	Number of manual address bindings.
Expired bindings	Number of expired address bindings.
Malformed messages	Number of malformed messages received by the DHCP.
Message Received or Sent	Number of the messages received and sent by the DHCP server respectively.

Command	Description
clear ip dhcp server statistics	Clears the DHCP server statistics.

N/A

### 4.59. show ip dhcp socket

Use this command to display the socket used by the DHCP server.

show ip dhcp socket

#### 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 socket used by the DHCP server.

```
QTECH#show ip dhcp socket
dhcp socket = 47.
```

#### Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A



## 5. DHCPV6 COMMANDS

### 5.1. clear ipv6 dhcp binding

Use this command to clear the DHCPv6 binding information.

```
clear ipv6 dhcp binding [ ipv6-address ]
```

#### Parameter Description

Parameter	Description
<i>ipv6-address</i>	Sets the IPv6 address or the prefix.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

If the *ipv6-address* is not specified, all DHCPv6 binding information is cleared. If the *ipv6-address* is specified, the binding information for the specified address is cleared.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example clears the DHCPv6 binding information:

```
QTECH(config)# clear ipv6 dhcp binding
```

Command	Description
N/A	N/A

N/A

### 5.2. clear ipv6 dhcp client

Use this command to reset the DHCPv6 client.



```
clear ipv6 dhcp client interface-type interface-number
```

#### Parameter Description

Parameter	Description
<i>interface-type</i> <i>interface-number</i>	Sets the interface type and the interface number.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

This command is used to reset the DHCPv6 client, which may lead the client to request for the configurations from the server again.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example resets DHCP client VLAN 1.

```
QTECH# clear ipv6 dhcp client vlan 1
```

Command	Description
N/A	N/A

N/A

### 5.3. clear ipv6 dhcp conflict

Use this command to clear the DHCPv6 address conflicts.

```
clear ipv6 dhcp conflict { ipv6-address | * }
```

#### Parameter Description

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



<i>ipv6-address</i>	Specifies IPv6 address or prefix.
*	All IPv6 addresses or prefixes

**Defaults** N/A

Command Mode

Privileged EXEC mode

**Usage Guide** If an IPv6 address conflict is detected, the DHCPv6 client will send the Decline message. Then the DHCPv6 server will add the address in this message into the address conflict queue. The addresses added into the address conflict queue cannot be assigned any longer.

If the \* parameter is not specified, all conflicts of IPv6 addresses or prefixes will be deleted. If the *ipv6-address* parameter is specified, only the specified address conflict will be deleted.

Configuration Examples

## Related Commands

## Platform Description

The following example clears a DHCPv6 address conflict.

```
QTECH# clear ipv6 dhcp conflict 2008:50::2
```

Command	Description
show ipv6 dhcp conflict	Displays address conflicts.

N/A

## 5.4. clear ipv6 dhcp relay statistics

Use this command to clear the packet sending and receiving condition with the DHCPv6 Relay function enabled.

```
clear ipv6 dhcp relay statistics
```

## Parameter Description

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

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

### Defaults

N/A

Command Mode  
Privileged EXEC mode

Usage Guide **N/A**

### Configuration Examples

### Related Commands

### Platform Description

The following example clears the packet sending and receiving condition with the DHCPv6 Relay function enabled.

```
QTECH# clear ipv6 dhcp relay statistics
```

Command	Description
show ipv6 dhcp relay statistics	Displays the statistical information.

N/A

### 5.5. clear ipv6 dhcp server statistics

Use this command to clear the DHCPv6 server statistics.

```
clear ipv6 dhcp server statistics
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults



### Command Mode

Privileged EXEC mode

### Usage Guide

This command is used to clear the DHCPv6 server statistics.

### Configuration

The following example clears the DHCPv6 server statistics.

### Examples

```
QTECH(config)# clear ipv6 dhcp server statistics
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 5.6. dns-server

Use this command to set the DNS Server list information for the DHCPv6 Server. Use the no form of this command to restore the default setting.

*dns-server ipv6-address*

*no dns-server ipv6-address*

### Parameter Description

Parameter	Description
<i>ipv6-address</i>	Sets the IPv6 address or the DNS server.

### Defaults

By default, no DNS server list is configured.

**Command Mode**

DHCPv6 pool configuration mode

**Usage Guide**

To configure several DNS Server addresses, use the `dns-server` command for several times. The newly-configured DNS Server address will not overwrite the former ones.

**Configuration Examples****Related Commands****Platform Description**

The following example configures the DNS server address.

```
QTECH(config-dhcp)# dns-server 2008:1::1
```

Command	Description
domain-name	Sets the DHCPv6 domain name information.
ipv6 dhcp pool	Sets a DHCPv6 pool.

N/A

**5.7. domain-name**

Use this command to set the domain name for the DHCPv6 server. Use the `no` form of this command to restore the default setting. **domain-name** *domain*

**no domain-name** *domain*

**Parameter Description**

Parameter	Description
<i>domain</i>	Sets the domain name.

**Defaults**

By default, no domain name is configured.

**Command Mode**

DHCPv6 pool configuration mode

**Usage Guide**

To configure several domain names, use the domain-name command for several times. The newly-configured domain name will not overwrite the former ones.

## Configuration Examples

## Related Commands

## Platform Description

The following example sets the domain name for the DHCPv6 server to example.com.

```
QTECH(config-dhcp) # domain-name example.com
```

Command	Description
dns-server	Sets the DHCPv6 DNS server list.
ipv6 dhcp pool	Sets the DHCPv6 pool.

N/A

## 5.8. iana-address prefix

Use this command to set the IA\_NA address prefix for the DHCPv6 Server. Use the **no** form of this command to restore the default setting.

**iana-address prefix** *ipv6-prefix/prefix-length* [ **lifetime** { *valid-lifetime* | *preferred-lifetime* } ]

**no** iana-address prefix

## Parameter Description

Parameter	Description
<i>ipv6-prefix/prefix-length</i>	Sets the IPv6 prefix and prefix length.
lifetime	Sets the lifetime of the address allocated to the client. With the keyword lifetime configured, both parameters <i>valid-lifetime</i> and <i>preferred-lifetime</i> shall be configured.
<i>valid-lifetime</i>	Sets the valid lifetime of using the allocated address for the client.

<i>preferred-lifetime</i>	Sets the preferred lifetime of the address allocated to the client.
---------------------------	---------------------------------------------------------------------

### Defaults

By default, no IA\_NA address prefix is configured.

The default *valid-lifetime* is 3,600s(1 hour).

The default *preferred-lifetime* is 3,600s(1 hour).

### Command Mode

DHCPv6 pool configuration mode

### Usage Guide

This command is used to set the IA\_NA address prefix for the DHCPv6 Server, and allocate the IA\_NA address to the client.

The Server attempts to allocate a usable address within the IA\_NA address prefix range to the client upon receiving the IA\_NA address request from the client. That address will be allocated to other clients if the client no longer uses that address again.

### Configuration Examples

### Related Commands

### Platform Description

The following example sets the IA\_NA address prefix for the DHCPv6 Server.

```
QTECH(config-dhcp)# iana-address prefix 2008:50::/64 lifetime 2000 1000
```

Command	Description
ipv6 dhcp pool	Sets the DHCPv6 pool.
show ipv6 dhcp pool	Displays the DHCPv6 pool information.

N/A

## 5.9. ipv6 dhcp client ia

Use this command to enable DHCPv6 client mode and request the IANA address from the DHCPv6 server. Use the **no** form of this command to restore the default setting.

**ipv6 dhcp client ia** [**rapid-commit**]

**no ipv6 dhcp client ia**

**Parameter Description**

Ш	Description
rapid-commit	Allows the two-message interaction process.

**Defaults** This function is disabled by default.

**Command Mode**

Interface configuration mode

**Usage Guide** This command is used to enable DHCPv6 client mode and request the IANA address from the DHCPv6 server,

The **rapid-commit** key allows the two-message interaction process between the client and the server. After the key is configured, the solicit message transmitted by the client contains the rapid-commit option.

**Configuration Examples**

The following example enables the request for the IANA address on the interface.

```
QTECH(config)# interface fastethernet 0/1
QTECH(config-if)# ipv6 dhcp client ia
```

**Related**

Command	Description
N/A	N/A

**Commands****Platform Description**

N/A

**5.10. ipv6 dhcp client pd**

Use this command to enable the DHCPv6 client and request for the prefix address information. Use the no form of this command to restore the default setting.

```
ipv6 dhcp client pd prefix-name [ rapid-commit ]
```

```
no ipv6 dhcp client pd
```

**Parameter Description**

Parameter	Description
<i>prefix-name</i>	Defines the IPv6 prefix name.
rapid-commit	Allows the two-message interaction process.

#### Defaults

This function is disabled by default.

#### Command Mode

Interface configuration mode

**Usage Guide** With the DHCPv6 client mode disabled, use this command to enable the DHCPv6 client mode on the interface.

With the `ipv6 dhcp client pd` command enabled, the DHCPv6 client sends the prefix request to the DHCPv6 server

The keyword `rapid-commit` allows the client and the server two-message interaction process. With this keyword configured, the solicit message sent by the client includes the `rapid-commit` item.

#### Configuration Examples

```
QTECH(config)# interface fastethernet 0/1
QTECH(config-if)# ipv6 dhcp client pd pd_name
```

The following example enables the prefix information request on the interface.

#### Related Commands

Command	Description
<code>clear ipv6 dhcp client</code>	Resets the DHCPv6 client function on the interface.
<code>show ipv6 dhcp interface</code>	Displays the DHCPv6 interface configuration.

#### Platform Description

N/A

## 5.11. ipv6 dhcp pool



Use this command to set the DHCPv6 server pool.

### Parameter Description

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

`ipv6 dhcp pool poolname`

`no ipv6 dhcp pool poolname`

Parameter	Description
<i>poolname</i>	Defines the DHCPv6 pool name.

### Defaults

By default, no DHCPv6 server pool is configured.

### Command Mode

Global configuration mode

### Usage Guide

This command is used to create a DHCPv6 Server configuration pool. After configuring this command, it enters the DHCPv6 pool configuration mode, in which the administrator can set the pool parameters, such as the prefix and the DNS Server information, ect.

After creating the DHCPv6 Server configuration pool, use the `ipv6 dhcp server` command to associate the pool and the DHCPv6 Server on one interface.

### Configuration Examples

The following example sets the DHCPv6 server pool.

```
QTECH# configure terminal
QTECH(config)# ipv6 dhcp
pool pool1
QTECH(config-dhcp)#
```

### Related Commands

Command	Description
<code>ipv6 dhcp server</code>	Enables the DHCPv6 server function on the interface.
<code>show ipv6 dhcp pool</code>	Displays the DHCPv6 pool information.

### Platform Description



## 5.12. ipv6 dhcp relay destination

Use this command to enable the DHCPv6 relay service and configure the destination address to which the messages are forwarded.

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

```
ipv6 dhcp relay destination ipv6-address [ interface-type interface-number ]
```

```
no ipv6 dhcp relay destination ipv6-address [ interface-type interface-number ]
```

### Parameter Description

Parameter	Description
<i>ipv6-address</i>	Sets the DHCPv6 relay destination address.
<i>interface-type</i> <i>interface-number</i>	(Optional) Specifies the forwarding output interface if the forwarding address is the local link address.

### Defaults

By default, the relay and forward function is disabled, and the forwarding destination address and the output interface are not configured.

### Command Mode

Interface configuration mode

### Usage Guide

With the DHCPv6 relay service enabled on the interface, the DHCPv6 message received on the interface can be forwarded to all configured destination addresses. Those received DHCPv6 messages can be from the client, or from another DHCPv6 relay service.

The forwarding output interface configuration is mandatory if the forwarding address is the local link address or the multicast address. And the forwarding output interface configuration is optional if the forwarding address is global or station unicast or multicast address.

Without the forwarding output interface configured, the interface is selected according to the unicast or multicast routing protocol.

The relay reply message can be forwarded without the relay function enabled on the interface.

### Configuration Examples



The following example enables DHCPv6 Relay and sets the relay destination address on the interface to 3001::2.

```
QTECH# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.

QTECH(config)# interface vlan 1
QTECH(config-if)# ipv6 dhcp relay destination 3001::2
QTECH(config-if)# end
```

### Related Commands

Command	Description
show ipv6 dhcp interface	Displays the DHCPv6 interface information.

### Platform Description

N/A

## 5.13. ipv6 dhcp server

Use this command to enable the DHCPv6 server on the interface. Use the no form of this command to restore the default setting. `ipv6 dhcp server poolname [ rapid-commit ] [ preference value ] no ipv6 dhcp server`

### Parameter Description

Parameter	Description
<i>poolname</i>	Defines the DHCPv6 pool name.
rapid-commit	Allows the two-message interaction process.
preference <i>value</i>	Sets the preference level for the advertise message. The valid range is from 1 to 100 and the default value is 0.

### Defaults

This function is disabled by default.

### Command Mode

Interface configuration mode

**Usage Guide** Use the `ipv6 dhcp server` command to enable the DHCPv6 service.

Configuring the keyword `rapid-commit` allows the two-message interaction for the server and the client when allocating the address prefix and setting other configurations. With this

keyword configured, if the client solicit message includes the rapid-commit item, the DHCPv6 Server will send the Reply message immediately.

DHCPv6 Server carries with the preference value when sending the advertise message if the

preference level is not 0.

If the preference level is 0, the advertise message will not include this field. If the preference value is 255, the client sends the request message to the server to obtain the configurations.

DHCPv6 Client, Server and Relay functions are exclusive, and only one of the functions can be configured on the interface.

### Configuration Examples

The following example enables the DHCPv6 server on the interface.

```
QTECH(config)# interface fastethernet 0/1
QTECH(config-if)# ipv6 dhcp server pool1
```

### Related Commands

Command	Description
ipv6 dhcp pool	Sets the DHCPv6 pool.
show ipv6 dhcp pool	Displays the DHCPv6 pool information.

### Platform Description

N/A

## 5.14. ipv6 local pool

Use this command to configure the local prefix pool of the DHCPv6 server prefix. Use the **no** form of this command to restore the default setting.

**ipv6 local pool** *poolname prefix/prefix-length assigned-length*

**no ipv6 local pool** *poolname*

### Parameter Description

Parameter	Description
<i>poolname</i>	The local prefix pool name
<i>prefix/prefix-length</i>	The prefix and prefix length
<i>assigned-length</i>	The assigned prefix length



## Defaults

By default, no local prefix pool of the DHCPv6 server prefix is configured.

## Command Mode

Global configuration mode

## Usage Guide

The **ipv6 local pool** command is used to create the local prefix pool. If the DHCPv6 server requires prefix delegation, you can use the **prefix-delegation pool** command to specify the local prefix pool and then assign prefixes from the prefix pool.

## Configuration Examples

The following example configures the local prefix pool.

```
QTECH(config)# ipv6 local pool client-prefix-pool 2001::db8::/64 80
```

The following example specifies the local prefix pool.

```
QTECH(config-dhcp) # prefix-delegation pool client-prefix-pool lifetime 2000
1000
```

## Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

## 5.15. option52

Use this command to configure the DHCPv6 Server to set the CAPWAP AC IPv6 address. Use the no form of this command to restore the default setting.

*option52 ipv6-address*

*no option52 ipv6-address*

Parameter Description

Parameter	Description
<i>ipv6-address</i>	Sets the CAPWAP AC IPv6 address.

**Defaults** By default, no option52 is created after pool configuration on the DHCPv6 server is complete.

**Command Mode**

DHCPv6 pool configuration mode

**Usage Guide**

This command can be used to set multiple CAPWAP AC IPv6 addresses. The newly added IPv6 address does not overwrite the old one.

**Configuration Examples****Related Commands**

The following example configures the domain-name address.

```
QTECH(config-dhcp) # option52 2008:1::1
```

Command	Description
N/A	N/A

**Platform Description**

N/A

**5.16. prefix-delegation**

Use this command to set the static binding address prefix information for the DHCPv6 server. Use the no form of this command to restore the default setting.

```
prefix-delegation ipv6-prefix/prefix-length client-DUID [ lifetime ]
```

```
no prefix-delegation ipv6-prefix/prefix-length client-DUID [ lifetime ]
```

**Parameter Description**

Parameter	Description
<i>ipv6-prefix/prefix-length</i>	Sets the IPv6 address prefix and the prefix length.
<i>client-DUID</i>	Sets the client DUID.
<i>lifetime</i>	Sets the interval of using the prefix by the client.

**Defaults**

By default, no address prefix information is configured.

The default *lifetime* is 3,600 seconds (one hour).

## Command Mode

DHCPv6 pool configuration mode

## Usage Guide

The administrator uses this command to manually set the address prefix information list for the client IA\_PD and set the valid lifetime for those prefixes.

The parameter *client-DUID* allocates the address prefix to the first IA\_PD in the specified client. Before receiving the request message for the address prefix from the client, DHCPv6 Server searches for the corresponding static binding first. If it succeeds, the server returns to the static binding; otherwise, the server will attempt to allocate the address prefix from other prefix information sources.

## Configuration Examples

### Related Commands

### Platform Description

The following example sets the prefix information for a DHCPv6 client.

```
QTECH(config-dhcp) # prefix-delegation 2008:2::/64
0003000100d0f82233ac
```

Command	Description
ipv6 dhcp pool	Sets a DHCPv6 pool.
ipv6 local pool	Sets a local prefix pool.
prefix-delegation pool	Specifies the DHCPv6 local prefix pool.
show ipv6 dhcp pool	Displays the DHCPv6 pool information.

N/A

## 5.17. prefix-delegation pool

Use this command to specify the local prefix pool for the DHCPv6 server. Use the no form of this command to restore the default setting.

```
prefix-delegation pool poolname [ lifetime { valid-lifetime | preferred-lifetime } ]
no prefix-delegation pool poolname
```

### Parameter Description

Parameter	Description
<i>poolname</i>	Sets the local prefix pool name.
<i>lifetime</i>	Sets the lifetime of the address prefix allocated to the client. With the keyword <i>lifetime</i> configured, both parameters <i>valid-lifetime</i> and <i>preferred-lifetime</i> shall be configured.
<i>valid-lifetime</i>	Sets the valid lifetime of using the allocated address prefix for the client.
<i>preferred-lifetime</i>	Sets the preferred lifetime of the address prefix allocated to the client.

### Defaults

By default, no address prefix pool is specified.

The default *valid-lifetime* is 3,600s(1 hour).

The default *preferred-lifetime* is 3,600s(1 hour).

### Command Mode

DHCPv6 pool configuration mode

### Usage Guide

Use the prefix-delegation pool command to set the prefix pool for the DHCPv6 Server and allocate the prefix to the client. Use the ipv6 local pool command to set the prefix pool.

The Server attempts to allocate a usable prefix from the prefix pool to the client upon receiving the prefix request from the client. That prefix will be allocated to other clients if the client no longer uses that prefix again.

### Configuration Examples

The following example specifies the local prefix pool for the DHCPv6 server.

### Related Commands



Command	Description
ipv6 dhcp pool	Sets a DHCPv6 pool.
ipv6 local pool	Sets a local prefix pool.
prefix-delegation	Statically binds the client with the address prefix.
show ipv6 dhcp pool	Displays the DHCPv6 pool information.

### Platform Description

N/A

## 5.18. show ipv6 dhcp

Use this command to display the device DUID.

show ipv6 dhcp

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode/Interface configuration mode/Global configuration mode

**Usage Guide** The server, client and relay on the same device share a DUID.

### Configuration Examples

```
QTECH# show ipv6 dhcp
```

```
This device's DHCPv6 unique identifier(DUID): 00:03:00:01:00:d0:f8:22:33:b0
```

The following example displays the device DUID.

### Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

## 5.19. show ipv6 dhcp binding

Use this command to display the address binding information for the DHCPv6 server.

show ipv6 dhcp binding [ *ipv6-address* ]

Parameter Description

Parameter	Description
<i>ipv6-address</i>	Sets the IPv6 address or the prefix.

Defaults    N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

If the *ipv6-address* is not specified, all prefixes dynamically assigned to the client and IANA address binding information are shown. If the *ipv6-address* is specified, the binding information for the specified address is shown.

### Configuration

The following example displays the address binding information for the DHCPv6 server.

### Examples

```
QTECH# show ipv6 dhcp binding
Client DUID: 00:03:00:01:00:d0:f8:22:33:ac IAPD: iaid 0,
  T1 1800, T2 2880
  Prefix: 2001:20::/72
           preferred lifetime 3600, valid lifetime 3600
           expires at Jan 1 2008 2:23 (3600 seconds)
```

**Related Commands**

Command	Description
N/A	N/A

**Platform Description**

N/A

**5.20. show ipv6 dhcp conflict**

Use this command to display the DHCPv6 address conflicts.

```
show ipv6 dhcp conflict
```

**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 DHCPv6 address conflicts.

```
QTECH# show ipv6 dhcp conflict 2008:50::2
                declined
2108:50::2      declined
2008:50::3      declined
2008:50::4      declined
2108:50::4      declined
2008:50::5      declined
```

Command	Description
clear ipv6 dhcp conflict	Clears address conflicts.

#### Platform Description

N/A

### 5.21. show ipv6 dhcp interface

Use this command to display the DHCPv6 interface information.

show ipv6 dhcp interface [ *interface-name* ]

#### Parameter Description

Parameter	Description
<i>interface-name</i>	Sets the interface name.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

If the *interface-name* is not specified, all DHCPv6 interface information is displayed. If the

*interface-name* is specified, the specified interface information is displayed.

#### Configuration Examples

The following example displays the DHCPv6 interface information.

```
QTECH# show ipv6 dhcp interface VLAN 1 is in  
server mode  
  Server pool dhcp-pool  
  Rapid-Commit: disable
```

#### Related Commands

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

N/A

N/A

**Platform Description**

N/A

**5.22. show ipv6 dhcp pool**

Use this command to display the DHCPv6 pool information.

```
show ipv6 dhcp pool [ poolname ]
```

**Parameter Description**

Parameter	Description
<i>poolname</i>	Defines the DHCPv6 pool name.

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

If the *poolname* is not specified, all DHCPv6 interface information is displayed. If the *poolname* is specified, the specified interface information is displayed.

**Configuration Examples**

The following example displays the DHCPv6 pool information.

```
QTECH# show ipv6 dhcp pool DHCPv6 pool:
dhcp-pool
  DNS server: 2011:1::1
  DNS server: 2011:1::2 Domain name:
  example.com
```

**Related Commands**

Command	Description
N/A	N/A

**Platform Description**

N/A

## 5.23. show ipv6 dhcp relay destination

Use this command to display the destination information about DHCPv6 Relay Agent.

**show ipv6 dhcp relay destination** { *all* | *interface-type interface-number* }

### Parameter description

Parameter	Description
<i>all</i>	Displays information about all configured destination addresses and relay exits.
<i>interface-type interface-number</i>	Displays the relay destination address and relay exit configured for a specified interface.

### Defaults

N/A

### Command mode

Privileged EXEC mode

### Usage guideline

Use this command to show the relay destination address to which DHCPv6 packets sent from a client are forwarded through a specified relay exit (optional) by an interface for which the relay function has been enabled by Relay Agent.

```
QTECH# show ipv6 dhcp relay destination all
Interface:VLAN 1
Destination address(es) 3001::2      Output Interface      VLAN 2
ff02::1:2
```

**Examples** The following example displays all the relay destination addresses.

### Related commands

Command	Description
N/A	N/A

### Platform description

N/A



## 5.24. show ipv6 dhcp relay statistics

Use this command to display the packet sending and receiving condition with the DHCPv6 Relay function enabled.

```
show ipv6 dhcp relay statistics
```

### 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 packet sending and receiving condition with the DHCPv6 Relay function enabled.

```
QTECH# show ipv6 dhcp relay statistics
Error                :2
Excess of rate limit :09
Packets received    28
SOLICIT              :0
REQUEST              :0
CONFIRM              :0
RENEW                :0
REBIND               :0
RELEASE              :0
DECLINE              :0
INFORMATION-REQUEST :14
RELAY-FORWARD        :0
RELAY-REPLY          :9:14
Packets sent         :9 16
ADVERTISE            : 0
RECONFIGURE          : 0
```



```
REPLY : 8
RELAY-FORWARD : 8
RELAY-REPLY :
```

### Related Commands

Command	Description
clear ipv6 dhcp relay statistics	Clears the statistical information.

### Platform Description

N/A

## 5.25. show ipv6 dhcp server statistics

Use this command to display the DHCPv6 server statistics.

```
show ipv6 dhcp server statistics
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command is used to display the DHCPv6 server statistics.

### Configuration Examples

The following example displays the DHCPv6 server statistics.

```
QTECH# show ipv6 dhcp server statistics
DHCPv6 server statistics:
Packet statistics:
DHCPv6 packets received:      7
Solicit received:             7
Request received:             0
Confirm received:             0
```



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```

Renew received:          0
Rebind received:        0
Release received:       0
Decline received:       0
Relay-forward received: 0
Information-request received: 0
Unknown message type received: 0
Error message received: 0
DHCPv6 packet sent:    0
Advertise sent:        0
Reply sent:            0
Relay-reply sent:      0
Send reply error: Send packet error:

```

### Related Commands

Command	Description
ipv6 dhcp pool	Sets a DHCPv6 pool.

### Platform Description

N/A

## 5.26. show ipv6 local pool

Use this command to display the local prefix pool configuration and usage.

```
show ipv6 local pool [poolname ]
```

### Parameter Description

Parameter	Description
<i>poolname</i>	The local prefix pool name

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command is used to display the local prefix pool configuration and usage.

## Configuration Examples

### Related Commands

### Platform Description

The following example displays all local prefix pool information.

```
QTECH#show ipv6 local pool
Pool                               Prefix
Free           In use
client-prefix-pool                2001:db8::/64
65536           0
```

Field	Description
Pool	The local address pool name.
Prefix	The prefix and prefix length.
Free	The available prefix.
In use	The prefix in use.

The following example displays the information about the specified local prefix pool.

```
QTECH#show ipv6 local pool client-prefix-pool
Prefix is 2001:db8::/64 assign /80 prefix
1 entries in use, 65535 available
Prefix                               Interface
2001:db8::/80                        GigabitEthernet 0/0
```

Field	Description
Prefix	The assigned prefix and prefix length.
Interface	The assigning interface.

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

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

N/A

## 6. DNS COMMANDS

### 6.1. clear host

Use this command to clear the dynamically learned host name.

```
clear host [ * | host-name ]
```

#### Parameter Description

Parameter	Description
<i>host-name</i>	Deletes the specified dynamic domain name buffer.
*	Deletes all dynamic domain name buffer.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode.

#### Usage Guide

You can obtain the mapping record of the host name buffer table in two ways: 1) the ip host static configuration, 2) the DNS dynamic learning. Execute this command to delete the host name records learned by the DNS dynamically.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following configuration deletes the dynamically learned mapping records from the host name-IP address buffer table.

```
QTECH(config)#clear host *
```

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

show hosts	Displays the host name buffer table.
------------	--------------------------------------

N/A

## 6.2. ip domain-lookup

Use this command to enable DNS domain name resolution. Use the no form of this command to disable the DNS domain name resolution function. Use the default form of this command to restore the default settings.

```
ip domain-lookup no ip domain-lookup
```

```
default ip domain-lookup
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Global configuration mode.

### Usage Guide

N/A

### Configuration Examples

### Related Commands

### Platform Description

The following example disables the DNS domain name resolution function.

```
QTECH(config)# no ip domain-lookup
```

Command	Description			
show hosts	Displays the information.	DN S	relat ed	configura tion

N/A

### 6.3. ip host

Use this command to configure the mapping of the host name and the IP address. Use the no form of the command to remove the host list.

`ip host host-name ip-address`

`no ip host host-name ip-address`

#### Parameter Description

Parameter	Description
<i>host-name</i>	The host name of the equipment
<i>ip-address</i>	The IP address of the equipment

#### Defaults

N/A

#### Command Mode

Global configuration mode.

#### Usage Guide

N/A

#### Configuration Examples

The following example configures IPv4 address 192.168.5.243 for domain name www.test.com.

```
QTECH(config)# ip host www.test.com 192.168.5.243
```



Command	Description			
show hosts	Show the information.	DN S	related	configuration

### Platform Description

N/A

## 6.4. ip name-server

Use this command to configure the IP address of the domain name server. Use the no form of this command to delete the configured domain name server.

```
ip name-server [ oob ] { ip-address | ipv6-address } [ via mgmt-name ]
```

```
no ip name-server [ oob ] { ip-address | ipv6-address } [ via mgmt-name ]
```

### Parameter Description

Parameter	Description
oob	Enables the out-band channel. It must be set when MGMT is specified as the source port.
<i>ip-address</i>	The IP address of the domain name server.
<i>ipv6-address</i>	The IPv6 address of the domain name server.
via	Configures MGMT port.
<i>mgmt-name</i>	Specifies the MGMT port in oob mode.

### Defaults

No domain name server is configured by default.

### Command Mode

Global configuration mode.



Usage Guide Add the IP address of the DNS server. Once this command is executed, the equipment will add a DNS server. When the device cannot obtain the domain name from a DNS server, it will attempt to send the DNS request to subsequent servers until it receives a response.

Up to 6 DNS servers are supported. You can delete a DNS server with the *ip-address* option or all the DNS servers.

### Configuration Examples

The following example configures the IPv4 and IPv6 DNS servers.

#### Related Commands

Command	Description
show hosts	Displays the information.
DNS	Related configuration

#### Platform Description

N/A

### 6.5. ipv6 host

Use this command to configure the mapping of the host name and the IPv6 address by manual. Use the **no** form of the command to remove the host list.

**ipv6 host** *host-name ipv6-address*

**no ipv6 host** *host-name ipv6-address*

#### Parameter Description

Parameter	Description
<i>host-name</i>	The host name of the equipment
<i>ipv6-address</i>	The IPv6 address of the equipment

#### Defaults

N/A





**Command Mode**

Global configuration mode.

**Usage Guide**

To delete the host list, use the **no ipv6 host** *host-name ipv6-address* command.

**Configuration Examples****Related Commands****Platform Description**

The following example configures the IPv6 address for the domain name.

```
QTECH(config)# ipv6 host switch 2001:0DB8:700:20:1::12
```

Command	Description			
<b>show hosts</b>	Displays the information.	DN S	relat ed	configura tion

N/A

**6.6. show hosts**

Use this command to display DNS configuration.

```
show hosts [ hostname ]
```

**Parameter Description**

Parameter	Description
hostname	Displays the specified domain name information,

**Defaults**

All domain name information is displayed by default.

**Command Mode**

## Usage Guide

This command is used to display the DNS related configuration information.

## Configuration Examples

```
QTECH# show hosts
Name servers are:
192.168.5.134 static

Host          type          Address          TTL(sec)
switch        static 192.168.5.243---
www.QTECH.comdynamic 192.168.5.123 126
```

Field	Description
Name servers	Domain name server
Host	Domain name
type	Resolution type: Static resolution and dynamic resolution.
Address	IP address corresponding to the domain name
TTL	TTL of entries corresponding to the domain name/IP address.

## Related Commands

Command	Description
<b>ip host</b>	Configures the host name and IP address mapping by manual.
<b>ipv6 host</b>	Configures the host name and IPv6 address mapping by manual.

<b>ip name-server</b>	Configures the DNS server.
-----------------------	----------------------------

**Platform Description**

N/A



## 7. FTP SERVER COMMANDS

### 7.1. ftp-server enable

Use this command to enable the FTP server. Use the default form of this command to restore the default setting.

```
ftp-server enable default ftp-server enable
```

Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

This function is disabled by default.

#### Command Mode

Global configuration mode

#### Usage Guide

This command is used to enable the FTP server to connect the FTP client to upload/download the files.

the ftp-server topdir command.

#### Configuration Examples

The following example enables the FTP Server and confines the FTP client access to the syslog subdirectory:

```
Qtech(config)# ftp-server topdir /syslog
```

```
Qtech(config)# ftp-server enable
```

QTECH(config)# ftp-server enableThe following example disables the FTP Server:

```
QTECH(config)# no ftp-server enable
```

#### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 7.2. ftp-server login timeout

Use this command to set the timeout interval for login to the FTP server. Use the no or default form of this command to restore the default setting.

ftp-server login timeout *time* no ftp-server login timeout default ftp-server login timeout

### Parameter Description

Parameter	Description
<i>time</i>	Sets the timeout interval for login to the FTP server, in the range from 1 to 30 in the unit of minutes.

### Defaults

The default is 2 minutes.

### Command Mode

Global configuration mode

### Usage Guide

The timeout interval refers to the maximum time when your account is allowed online after you login to the server. If you don't perform authentication again before the timeout interval expires, you will be forced offline.

### Configuration Examples

Related Commands

### Platform Description

The following example sets the timeout interval for login to the FTP server to 5 minutes.

```
QTECH(config)# ftp-server login timeout 5
```

The following example restores the default setting.

```
QTECH(config)# no ftp-server login timeout
```

Command	Description
N/A	N/A

N/A

### 7.3. ftp-server login times

Use this command to set the number of login attempts. Use the **no** or **default** form of this command to restore the default setting.

ftp-server login times *time* no ftp-server login times default ftp-server login times

#### Parameter Description

Parameter	Description
<i>time</i>	Sets the number of login attempts, in the range from 1 to 10.

Defaults      The default is 3.

#### Command Mode

Global configuration mode

#### Usage Guide

The number of login attempts refers to the maximum count you are allowed to perform authentication. If the number of your login attempts exceeds 3, you will be forced offline.

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example sets the number of login attempts to 5.



```
QTECH(config)# ftp-server login times 5
```

The following example restores the default setting.

```
QTECH(config)# no ftp-server login times
```

Command	Description
N/A	N/A

N/A

## 7.4. ftp-server timeout

Use this command to set the FTP session idle timeout. Use the **no** or **default** form of this command to restore the default setting.

```
ftp-server timeout time no ftp-server timeout default ftp-server timeout
```

### Parameter Description

Parameter	Description
<i>time</i>	Sets the session idle timeout, in the range from 1 to 3600 in the unit of minutes.

### Defaults


The default is 10 minutes.

### Command Mode

Global configuration mode.

### Usage Guide

Use this command to set the FTP session idle timeout. If the session is idle, the FTP server

 The session idle time refers to the time for the FTP session between deems the session connection is invalid and disconnects with the user.

### Configuration Examples

The following example sets the session idle timeout to 5 minutes:

```
QTECH(config)# no ftp-server timeout
```

The following example restores the default setting.

#### Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A

### 7.5. ftp-server topdir

Use this command to set the directory range for the FTP client to access to the FTP server files. Use the **no** or **default** form of this command to restore the default setting.

```
ftp-server topdir directory no ftp-server topdir default ftp-server topdir
```

#### Parameter Description

Parameter	Description
<i>directory</i>	Sets the top-directory.

#### Defaults

No top-directory is configured by default.

#### Command Mode

Global configuration mode.

**Usage Guide** The FTP server top directory specifies the directory range of the files accessed by the client. Can the FTP client accesses to the files on the FTP server with the top directory correctly specified.

Without this command configured, FTP client fails to access to any file or directory on the FTP server.

#### Configuration Examples



The following example enables the FTP Server and confines the FTP client access to the syslog subdirectory.

```
Qtech(config)# ftp-server topdir /syslog
```

## Related Commands

### Platform Description

```
QTECH(config)# ftp-server enable
```

The following example restores the default setting.

```
QTECH(config)# no ftp-server topdir
```

Command	Description
N/A	N/A

N/A

## 7.6. ftp-server username password

Use this command to set the login username and password for the FTP server. Use the no form of this command to restore the default setting.

```
ftp-server username username password [type] password
```

```
no ftp-server username username
```

```
default ftp-server username username
```

### Parameter Description

Parameter	Description
<i>username</i>	Sets the login username.
<i>password</i>	Sets the log password

### Defaults

No username or password is set by default.

### Command Mode

Global configuration mode

### Usage Guide

Use this command to set the login username for the FTP server. To log in to the FTP server, the correct username and password shall be provided.

The maximum length of the username is 64 characters and the spaces are not allowed in the middle of the username. The username consists of letters, semiangle number and semiangle mark. Ten usernames can be configured for the FTP server at most.

The password must contain letters or numbers. Spaces before or behind the password are allowed but will be ignored. The spaces within are part of the password.

The plaintext password is in the range from 1 to 25 characters. The encrypted password is in the range from 4 to 52 characters.



The anonymous user login is not supported on the FTP server. The client fails to pass the identity verification if the username is removed.

### Configuration Examples

The following example sets the username to user:

```
QTECH(config)# ftp-server username user password pass
```

The following example restores the default setting:

```
QTECH(config)# no ftp-server username user
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 7.7. show ftp-server

Use this command to show the status information of the FTP server.

```
show ftp-server
```

### Parameter Description

Parameter	Description
N/A	N/A

Defaults

N/A

## Command Mode

Privileged EXEC mode

## Usage Guide

The FTP server status information includes:

- ❖ Enabled/Disabled server
- ❖ The FTP server top directory
- ❖ The FTP server user information, including username, password and connection number. If connection is set up, the IP address, port, transmission type, active/passive mode is shown

## Configuration Examples

The following example displays the related status information of the FTP server:

```
QTECH#show ftp-server ftp-server
information
=====
enable : Y
topdir : tmp:/ timeout: 10min
```

```
username:aaaa      password:(PLAIN)bbbb      connect num[2]
[0] trans-type:BINAR (ctrl)server IP:192.168.21.100[21]
client IP:192.168.21.26[3927]
[1] trans-type:ASCII (ctrl)server IP:192.168.21.100[21]
client IP:192.168.21.26[3929]

username:a1        password:(PLAIN)bbbb      connect num[0]
username:a2        password:(PLAIN)bbbb      connect num[0]
username:a3        password:(PLAIN)bbbb      connect num[0]
username:a4        password:(PLAIN)bbbb      connect num[0]
username:a5        password:(PLAIN)bbbb      connect num[0]
username:a6        password:(PLAIN)bbbb      connect num[0]
username:a7        password:(PLAIN)bbbb      connect num[0]
username:a8        password:(PLAIN)bbbb      connect num[0]
username:a9        password:(PLAIN)bbbb      connect num[0]
```

## Related Commands

Command	Description
N/A	N/A

**Platform Description**

N/A

## 8. FTP CLIENT COMMANDS

### 8.1. copy flash

Use this command to upload the file from the server to the device through FTP Client.

```
copy flash:[ local-directory/ ] local-file ftp://username:password@dest-address [ /remote-directory ] /
```

```
remote-file
```

#### Parameter Description

Parameter	Description
<i>username</i>	The username for logging into FTP Server. It is limited to 40 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
<i>password</i>	The password for logging into FTP Server. It is limited to 32 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
<i>dest-address</i>	IP address of the target FTP Server.
<i>remote-directory</i>	File directory of FTP Server. It is optional and limited to 255 bytes. No space or Chinese character is supported. If left blank, it implies the current directory of FTP server.
<i>remote-file</i>	Filename on the remote server. It is limited to 255 bytes and doesn't support space or Chinese character.
<i>local-directory</i>	Directory of local folder (optional). If this directory is specified, this directory must have been created beforehand. This command doesn't support automatic directory creation. If left blank, it implies the current directory on the local device. It is limited to 255 bytes and doesn't support space or Chinese characters.
<i>local-file</i>	Filename on the local device. It is limited to 255 bytes and doesn't support space or Chinese character.

#### Defaults

N/A

#### Command Mode

## Privileged EXEC mode

## Usage Guide

N/A

## Configuration Examples

The following example uploads the file named "local-file" in directory "home" of local device to directory "root" on the FTP Server whose user name is user, password is pass and IP address is 192.168.23.69, and changes the filename to "remote-file".

```
Qtech# copy flash:home/local-file
ftp://user:pass@192.168.23.69/root/remote-file
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 8.2. copy ftp

Use this command to download the file from the server to the device through FTP Client.

```
copy ftp://username:password@dest-address [ /remote-directory ] /
remote-file
```

```
flash:[ local-directory/ ] local-file]
```

## Parameter Description

Parameter	Description
<i>username</i>	The username for logging into FTP Server. It is limited to 40 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
<i>password</i>	The password for logging into FTP Server. It is limited to 32 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
<i>dest-address</i>	IP address of the target FTP Server.

<i>remote-directory</i>	File directory of FTP Server. It is optional and limited to 255 bytes. No space or Chinese character is supported. If left blank, it implies the current directory of FTP server.
<i>remote-file</i>	Filename on the remote server. It is limited to 255 bytes and doesn't support space or Chinese character.
<i>local-directory</i>	Directory of local folder (optional). If this directory is specified, this directory must have been created beforehand. This command doesn't support automatic directory creation. If left blank, it implies the current directory on the local device. It is limited to 255 bytes and doesn't support space or Chinese characters.
<i>local-file</i>	Filename on the local device. It is limited to 255 bytes and doesn't support space or Chinese character.

**Defaults**

N/A

**Command Mode****Privileged EXEC mode****Usage Guide**

N/A

**Configuration Examples****Related Commands****Platform Description**

The following example uses username of "user" and password of "pass" to download a file named "remote-file" from the directory "root" on FTP Server with IP address 192.168.23.69 to directory "home" on the local device, and changes the name to "local-file".

```
QTECH# copy ftp://user:pass@192.168.23.69/root/remote-file flash:home/local-file
```

The following example uploads a file named “local-file” from directory “home” on the local device to directory “root” on FTP Server, and changes the name to “remote-file”.

```
QTECH# copy flash:home/local-file ftp://user:pass@192.168.23.69/root/remote-file
```

Command	Description
<b>copy tftp</b>	Uses the TFTP protocol to transfer files.

N/A

### 8.3. ftp-client ascii

Use this command to use ASCII mode for FTP transfer.

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

**ftp-client [ vrf vrfname ] ascii**

**no ftp-client [ vrf vrfname ] ascii default ftp-client [ vrf vrf-name ]**

#### Parameter Description

Parameter	Description
<b>vrf vrf-name</b>	Configures the file transfer mode for the specified VRF.

#### Defaults

The default FTP transfer mode is binary.

#### Command Mode

Global configuration mode

#### Usage Guide

The **default** command is used to restore the FTP client setting. Specifically, data connection is in PASV mode and file transfer BINARY. The client source IP address is not bound.

#### Configuration

The following example configures ASCII FTP transfer.





## Examples

```
QTECH (config)# ftp-client ascii
```

The following example configures ASCII FTP transfer for *vrf-name*.

```
QTECH(config)# ftp-client vrf vrf-name ascii
```

The following example configures binary FTP transfer.

```
QTECH(config)# no ftp-client ascii
```

The following example configures binary FTP transfer for *vrf-name*.

```
QTECH(config)# no ftp-client vrf vrf-name ascii
```

The following example restores the default setting of the FTP Client.

```
QTECH(config)# default ftp-client
```

The following example restores the default setting of the FTP Client *vrf-name*,

```
QTECH(config)# default ftp-client vrf vrf-name
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 8.4. ftp-client port

Use this command to configure PORT mode used for FTP data connection. Use the no or default

form of this command to restore the default setting.

```
ftp-client [ vrf vrf-name ] port no ftp-client [ vrf vrf-name ] port default ftp-client [ vrf vrf-name ]
```

## Parameter Description

Parameter	Description
<b>vrf</b> <i>vrf-name</i>	VRF name The default is the public network instance.



## Defaults

The default is PASV mode for FTP data connection.

## Command Mode

Global configuration mode.

## Usage Guide

This command is used to configure the connection mode to PORT mode, in which the server will actively connect with the client.

The default command is used to restore the FTP client setting. Specifically, data connection is in PASV mode and file transfer BINARY. The client source IP address is not bound.

## Configuration Examples

The following example configures PORT mode used for FTP data connection

```
QTECH (config)# ftp-client port
```

The following example configures PORT mode used for FTP *vrf-name* data connection.

```
QTECH(config)# ftp-client vrf vrf-name port
```

The following example configures PASV mode for FTP data connection.

```
QTECH(config)# no ftp-client port
```

The following example configures PASV mode used for FTP *vrf-name* data connection.

```
QTECH(config)# no ftp-client vrf vrf-name port
```

The following example restores the default setting of the FTP Client.

```
QTECH(config)# default ftp-client
```

The following example restores the default setting of the FTP Client *vrf-name*,

```
QTECH(config)# default ftp-client vrf vrf-name
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 8.5. ftp-client source

Use this command to bind FTP Client with the source IP address of client and use this IP address to communicate with server. Use the **no** form of this command to disable source IP address binding. Use the **default** form of this command to restore the default setting.

**ftp-client** [ vrf *vrf-name* ] **source** { *ip-address* | *ipv6-address* | *interface* }

**no ftp-client** [ vrf *vrf-name* ] **source default ftp-client** [ vrf *vrf-name* ]

### Parameter Description

Parameter	Description
vrf <i>vrf-name</i>	VRF name. The default is the public network instance.

### Defaults

By default, the IP address is not bound with the client locally. Instead, it is selected by the route.

### Command Mode

Global configuration mode

### Usage Guide

The default command is used to restore the FTP client setting. Specifically, data connection is in PASV mode and file transfer BINARY. The client source IP address is not bound.

The `ftp-client [ vrf vrfname ] source-address {ip-address | ipv6-address}` command will be converted to this command automatically

### Configuration Examples

The following example binds FTP Client with source IP address 192.168.23.236.

```
QTECH(config)# ftp-client source 192.168.23.236
```

The following example binds FTP Client with source IP address 2003:0:0:0::2.

```
192.168.23.236.QTECH(config)# ftp-client source 2003:0:0:0::2
```

The following example binds FTP Client *vrf-name* with source IP address

```
QTECH(config)# ftp-client vrf vrf-name source 192.168.23.236
```

The following example binds FTP Client *vrf-name* with source IP address 2003:0:0:0::2.

```
QTECH(config)# ftp-client vrf vrf-name source 2003:0:0:0::2
```



The following example disables source IP address binding.

```
QTECH(config)# no ftp-client source
```

The following example disables source IP address binding.

```
QTECH(config)# no ftp-client vrf vrf-name source
```

The following example restores the default setting of the FTP Client.

```
QTECH(config)# default ftp-client
```

The following example restores the default setting of the FTP Client vrf-name,

```
QTECH(config)# default ftp-client vrf vrf-name
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 9. TFTP SERVER COMMANDS

### 9.1. tftp-server enable

Use this command to enable the TFTP server.

Use the **no** form of this command to disable the TFTP server.

tftp-server enable

**no tftp-server enable**

#### Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

The TFTP server is disabled by default.

#### Command Modes

Global configuration mode

#### Usage Guide

Only with the TFTP server enabled and the top directory configured meanwhile, TFTP clients are able to upload or download files.

#### Configuration Examples

The following example enables the TFTP server and sets the top directory of the TFTP server to **/syslog**.

```
QTECH(config)# tftp-server topdir /syslog
QTECH(config)# tftp-server enable
```

The following example disables the TFTP server.

```
QTECH(config)# no tftp-server enable
```

#### Platform Description

N/A

### 9.2. tftp-server topdir

Use this command to configure the top directory for TFTP clients.

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

tftp-server topdir **directory** no tftp-server topdir default tftp-server topdir

#### Parameter Description

Parameter	Description
<i>directory</i>	The top directory for TFTP clients to access. “/” means the root directory.

## Defaults

By default, the top directory is /flash.

## Command Modes

Global configuration mode

## Usage Guide

The top directory on the TFTP server defines what files and folders the client is able to access. And the client cannot access the TFTP server before a top directory is correctly configured for the server.

## Configuration Examples

The following example enables the TFTP server and sets the top directory for TFTP clients to **/syslog**.

```
QTECH(config)# tftp-server topdir /syslog
QTECH(config)# tftp-server enable
```

The following example restores the default top directory.

```
QTECH(config)# no tftp-server topdir
```

## Platform Description

N/A

show tftp-server

Use this command to display the configuration of the TFTP server.

show tftp-server

## Parameter Description

Parameter	Description
N/A	N/A

## Defaults

N/A

## Command Modes

Global configuration mode/Privileged configuration mode/Interface configuration mode

## Usage Guide



N/A

## Configuration Examples

The following example displays the progress of downloading the TFTP client.

```
QTECH# show tftp-server
      tftp-server information
=====
enable : Y
topdir  : flash:/
```

### Platform

N/A

### Description

## 9.3. show tftp-server updating-list

Use this command to display the progress of downloading the TFTP client.

```
show tftp-server updating-list
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Modes

Global configuration mode/Privileged configuration mode/Interface configuration mode

Usage Guide This command is supported only on AM5528 products.

## Configuration Examples

The following example displays the progress of downloading the TFTP client.

```
QTECH# show tftp-server updating-list
```





IP Address	Interface	File Name	TX	Elapse
171.208.208.2	GigabitEthernet	0/7	main_map552.bin	6.28392% 00:00:05

**Platform Description**

N/A



## 10. TCP COMMANDS

### 10.1. ip tcp keepalive

Use this command to enable the TCP keepalive function. Use the **no** form of this command to restore the default setting,

```
ip tcp keepalive [ interval num1 ] [ times num2 ] [ idle-period num3 ]
```

Parameter Description

Parameter	Description
<i>interval num1</i>	The interval of sending the keepalive packet, in the range from 1 to 120 in the unit of seconds, The default is 75.
<i>times num2</i>	Keepalive packet sending times, in the range from 1 to 10. The default is 6.
<i>idle-period num3</i>	Idle time, the time period during which the peer end does not send any packet to the local end, in the range from 60 to 1800 in the unit of seconds. The default is 900.

#### Defaults

The function is disabled by default.

#### Command Mode

Global configuration mode

**Usage Guide** The keepalive function enables TCP to detect whether the peer end is operating properly.

Suppose the keepalive function is enabled together with default **interval**, **times** and **idle-period** settings. TCP begins to send the keepalive packet at an interval of 75 seconds if it does not receive any packet from the peer end in 900 seconds. The TCP connection is considered invalid and then disconnected automatically if the device sends the keepalive

packet for six consecutive times without receiving any TCP packet from the peer end. This command applies to both IPv4 and IPv6 TCP.

Configuration Examples

## Related Commands

## Platform Description

The following example enables the TCP keepalive function on the device and sets the **idle-period** and **interval** to 180 and 60 respectively. If the device sends the keepalive packet for four consecutive times without receiving any TCP packet from the peer end, the TCP connection is considered invalid. `QTECH(config)# ip tcp keepalive interval 60 times 4 idle-period 180`

Command	Description
N/A	N/A

N/A

## 10.2. ip tcp mss

Use this command to set the upper limit of the MSS value. Use the **no** form of this command to restore the default setting.

**ip tcp mss** *max-segment-size*

no ip tcp mss

## Parameter Description

Parameter	Description
<i>max-segment-size</i>	Upper limit of the MSS value in the range from 68 to 10,000 bytes

### Defaults

The default MSS = Outgoing IPv4/v6 MTU- IPv4/v6 header-TCP header.

### Command Mode

Global configuration mode

## Usage Guide

This command is used to limit the maximum value of MSS for the TCP connection to be created. The negotiated MSS cannot exceed the configured value. You can use this command to reduce the maximum value of MSS. However, this configuration is not needed in general. This command applies to both IPv4 and IPv6 TCP.

## Configuration Examples

## Related Commands

## Platform Description

The following example sets the upper limit of the MSS value to 1,300 bytes.

```
QTECH(config)# ip tcp mss 1300
```

Command	Description
N/A	N/A

N/A

## 10.3. ip tcp path-mtu-discovery

Use this command to enable Path Maximum Transmission Unit (PMTU) discovery function for TCP in global configuration mode. Use the **no** form of this command to restore the default setting.

```
ip tcp path-mtu-discovery [ age-timer minutes | age-timer infinite ]
```

```
no ip tcp path-mtu-discovery
```

## Parameter Description

Parameter	Description
<b>age-timer</b> <i>minutes</i>	The time interval for further discovery after discovering PMTU. Its value ranges from 10 to 30 minutes. The default value is 10.
<b>age-timer</b> <i>infinite</i>	No further discovery after discovering PMTU

## Defaults

This function is disabled by default.

## Command Mode

Global configuration mode

## Usage Guide

Based on RFC1191, the TCP path MTU function improves the network bandwidth utilization and data transmission when the user uses TCP to transmit the data in batch.

Enabling or disabling this function takes no effect for existent TCP connections and is only effective for TCP connections to be created. This command applies to only IPv4 TCP. This function is enabled for IPv6 TCP constantly and cannot be disabled.

According to RFC1191, after discovering the PMTU, the TCP uses a greater MSS to detect the new PMTU at a certain interval, which is specified by the parameter **age-timer**. If the PMTU discovered is smaller than the MSS negotiated between two ends of the TCP connection, the device will be trying to discover the greater PMTU at the specified interval until the PMTU value reaches the MSS or the user stops this timer. Use the parameter **age-timer infinite** to stop this timer.

## Configuration Examples

## Related Commands

## Platform Description

The following example enables PMTU discovery.

```
QTECH(config)# ip tcp path-mtu-discovery
```

Command	Description
show tcp pmtu	Shows the PMTU value for the TCP connection.

N/A

## 10.4. ip tcp send-reset

Use this command to enable the device to send the reset packet when receiving the TCP port unreachable packet. Use the no form of this command to disable this function,

```
ip tcp send-reset
```

```
no ip tcp send-reset
```

## Parameter Description

Parameter	Description
N/A	N/A

### Defaults

This function is enabled by default.

### Command Mode

Global configuration mode

### Usage Guide

In general, when dispatching the TCP packet, the TCP module replies a reset packet automatically to disconnect the TCP connection with the peer end if the TCP connection that this packet belongs to is not found. However, flooding TCP port unreachable packets pose an attack threat to the device. This command can be used to disable the device from sending the reset packet when receiving the TCP port unreachable packet. This command applies to both IPv4 and IPv6 TCP.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example disables the device from sending the reset packet when receiving the TCP port unreachable packet.

```
QTECH(config)# no ip tcp send-reset
```

Command	Description
N/A	N/A

N/A

### 10.5. ip tcp synwait-time

Use this command to set the timeout value for SYN packets (the maximum time from SYN transmission to successful three-way handshake). Use the no form of this command to restore the default setting.

`ip tcp synwait-time seconds`

`no ip tcp synwait-time seconds`



## Parameter Description

Parameter	Description
<i>seconds</i>	Timeout value for SYN packets in the range from 5 to 300 in the unit of seconds.

## Defaults

The default is 20.

## Command Mode

Global configuration mode

## Usage Guide

If there is an SYN attack in the network, reducing the SYN timeout value can prevent resource consumption, but it takes no effect for successive SYN attacks. When the device actively requests a connection with an external device, reducing the SYN timeout value can shorten the time for the user to wait, such as telnet login. For poor network conditions, the timeout value can be increased properly. This command applies to both IPv4 and IPv6 TCP.

## Configuration Examples

The following example set the timeout value for SYN packets to 10 seconds.

```
QTECH(config)# ip tcp syntime-out 10
```

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 10.6. ip tcp window-size

Use this command to change the size of receiving buffer and sending buffer for TCP connections. Use the no form of this command to restore the default setting.

```
ip tcp window-size size
```

```
no ip tcp window-size
```



## Parameter Description

Parameter	Description
<i>size</i>	Size of receiving buffer and sending buffer for TCP connections in the range from 128 to 65535 << 14 bytes.

### Defaults

The default is 65535.

### Command Mode

Global configuration mode

**Usage Guide** The TCP receiving buffer is used to buffer the data received from the peer end. These data will be subsequently read by application programs. Generally, the window size of TCP packets implies the size of free space in the receiving buffer. For connections involving a large bandwidth and mass data, increasing the size of receiving buffer will remarkably improve TCP transmission performance.

## Configuration Examples

### Related Commands

### Platform Description

The following example sets the TCP window size to 16386 bytes.

```
QTECH(config)# ip tcp window-size 16386
```

Command	Description
N/A	N/A

N/A

## 10.7. show ipv6 tcp connect

Use this command to display the current IPv6 TCP connection information.



## Parameter Description

```
show ipv6 tcp connect [ local-ipv6 X:X:X:X::X ] [ local-port num ] [ peer-ipv6 X:X:X:X::X ]
[ peer-port num ]
```

Use this command to display the current IPv6 TCP connection statistics.

```
show ipv6 tcp connect statistics
```

Parameter	Description
local-ipv6 X:X:X:X::X	Local IPv6 address
local-port <i>num</i>	Local port
peer-ipv6 X:X:X:X::X	Peer IPv6 address
peer-port <i>num</i>	Peer port
statistics	Displays IPv6 TCP connection statistics

**Defaults**

N/A

**Command Mode****Privileged EXEC mode****Usage Guide**

N/A

**Configuration**

The following example displays the current IPv6 TCP connection information.

Examples	QTECH#show ipv6 tcp connect				
	Number name	Local Address	Foreign Address	State	Process
	1	:::22	:::0	LISTEN	rg-sshd
	2	:::23	:::0	LISTEN	rg-telnetd
	3	1000::1:23	1000::2:6420 1	ESTABLISHED	rg-telnetd

The following example displays the current IPv6 TCP connection statistics.



```
QTECH#show ipv6 tcp connect statistics
```

```

State          Count
-----
ESTABLISHED    1
SYN_SENT       0
SYN_RECV       0
FIN_WAIT_1     0
FIN_WAIT_2     0
TIME_WAIT      0
CLOSED         0
CLOSE_WAIT     0
LAST_ACK       0
LISTEN         1
CLOSING        0
Total: 2

```

Related

Commands

Command	Description
N/A	N/A

Platform Description

N/A

### 10.8. show ipv6 tcp pmtu

Use this command to display information about IPv6 TCP PMTU.

**show ipv6 tcp pmtu** [ **local-ipv6** X:X:X:X::X ] [ **local-port** num ] [ **peer-ipv6** X:X:X:X::X ] [ **peer-port**

*num* ]

Parameter	Description
local-ipv6 X:X:X:X::X	Local IPv6 address
local-port <i>num</i>	Local port
peer-ipv6 X:X:X:X::X	Peer IPv6 address
peer-port <i>num</i>	Peer port

Parameter Description

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH#show pv6 tcp port TCP pmtu
Number  Local Address      Foreign Address      PMTU
1       1000::1:23          1000::2:13560
```

The following example information about IPv6 TCP PMTU.

Field	Description
Number	Number
Local Address	Local address and port number. The number after the last colon is the port number.
Foreign Address	Remote address and port number. The number after the last colon is



	the port number.
PMTU	Path MTU.

#### Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A

### 10.9. show ipv6 tcp port

Use this command to display the current IPv6 TCP port status.

**show ipv6 tcp port** [ *num* ]

#### Parameter Description

Parameter	Description
<i>num</i>	Port number

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

N/A

#### Configuration Examples

The following example displays the current IPv6 TCP port status.

```
QTECH#show ipv6 tcp port TCP connections
on port 23:
Number  Local Address Foreign Address  State
1       1000::1:23    1000::2:64571    ESTABLISHED
```



```
Total: 1
```

```
TCP connections on port 2650:
```

```
Number Local Address Foreign Address State Total: 0
```

Field	Description
Number	Number
Local Address	Local address and port number.
Foreign Address	Remote address and port number.
State	<p>Current status of the TCP connection. There are eleven possible states: CLOSED: The connection has been closed.</p> <p>LISTEN: Listening state</p> <p>SYNSENT: In the three-way handshake phase when the SYN packet has been sent out.</p> <p>SYNRCVD: In the three-way handshake phase when the SYN packet has been received.</p> <p>ESTABLISHED: The connection has been established. FINWAIT1: The local end has sent the FIN packet.</p> <p>FINWAIT2: The FIN packet sent by the local end has been acknowledged.</p> <p>CLOSEWAIT: The local end has received the FIN packet from the peer end.</p> <p>LASTACK: The local end has received the FIN packet from the peer end, and then sent its own FIN packet.</p> <p>CLOSING: The local end has sent the FIN packet from the peer end, and received the FIN packet from the peer end before the ACK packet for the peer end to respond with this FIN packet is received.</p> <p>TIMEWAIT: The FIN packet sent by the local end has been acknowledged, and the local end has also acknowledged the FIN packet.</p>

## Related Commands

Command	Description
N/A	N/A

#### Platform Description

N/A

### 10.10. show tcp connect

Use this command to display basic information about the current TCP connections.

**show tcp connect** [ **local-ip** *a.b.c.d* ] [ **local-port** *num* ] [ **peer-ip** *a.b.c.d* ] [ **peer-port** *num* ] Use this command to display the current IPv4 TCP connection statistics.

show tcp connect statistics

#### Parameter Description

Parameter	Description
local-ip <i>a.b.c.d</i>	Local IP address.
local-port <i>num</i>	Local port.
peer-ip <i>a.b.c.d</i>	Peer IP address.
peer-port <i>num</i>	Peer port.
statistics	Displays IPv4 TCP connection statistics.

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

N/A

```
QTECH#show tcp connect
Number Local Address State Foreign Address Process name
```



```
3 1.1.1.1:23 1.1.1.2:64201 ESTABLISHED rg-telnetd
```

The following example displays the current IPv4 TCP connection information.

```
1 0.0.0.0:22 0.0.0.0:0 LISTEN rg-sshd
2 0.0.0.0:23 0.0.0.0:0 LISTEN rg-
telnetd
```

Field	Description
Number	Sequence number.
Local Address	The Local address and port number. The number after the last “.” is the port number. For example, in “2002::2.23” and “192.168.195.212.23” , “23” is the port number.
Foreign Address	The remote address and port number. The number after the last “.” is the port number. For example, in “2002::2.23” and “192.168.195.212.23” , “23” is the port number.
State	<p>Current status of the TCP connection. There are eleven possible states:</p> <p><b>CLOSED:</b> The connection has been closed.</p> <p><b>LISTEN:</b> Listening state</p> <p><b>SYNSENT:</b> In the three-way handshake phase when the SYN packet has been sent out.</p> <p><b>SYNRCVD:</b> In the three-way handshake phase when the SYN packet has been received.</p> <p><b>ESTABLISHED:</b> The connection has been established.</p> <p><b>FINWAIT1:</b> The local end has sent the FIN packet.</p> <p><b>FINWAIT2:</b> The FIN packet sent by the local end has been acknowledged.</p> <p><b>CLOSEWAIT:</b> The local end has received the FIN packet from the peer end.</p> <p><b>LASTACK:</b> The local end has received the FIN packet from the peer end, and then sent its own FIN packet.</p> <p><b>CLOSING:</b> The local end has sent the FIN packet from the peer end, and received the FIN packet from the peer end before the ACK packet for the peer end to respond with this</p>

	FIN packet is received. TIMEWAIT: The FIN packet sent by the local end has been acknowledged, and the local end has also acknowledged the
	FIN packet.
Process name	Process name.

### Related Commands

### Platform Description

The following example displays the current IPv4 TCP connection statistics.

```
QTECH#show tcp connect statistics

State          Count
-----
ESTABLISHED    1
SYN_SENT       0
SYN_RECV       0
FIN_WAIT       0
1
```



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```

FIN_WAIT      0
2

TIME_WAIT     0

CLOSED        0

CLOSE_WAIT    0

LAST_ACK      0

LISTEN        1

CLOSING       0

Total: 2
    
```

Command	Description
N/A	N/A

N/A

### 10.11. show tcp parameter

**Use this command to show**

TCP parameters.

show tcp parameter

Parameter Description

Parameter	Description
N/A	N/A

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

**Usage Guide**

N/A

**Configuration Examples**

```
QTECH#show tcp
parameter Hash
table information:
  Established hash bucket
  size: 16384 Bind hash bucket
  size: 16384
Memory information:
  Global memory limit: low=92160, pressure=122880, high=184320 (unit:
  pages) Per-socket receive buffer size: min=4096, default=87380,
  max=3932160 (unit:
bytes)
  Per-socket send buffer size: min=4096, default=16384, max=3932160
(unit: bytes)
  Current allocated
  memory: 0 Current memory
  pressure flag: 0
SYN specific information:
  Max SYN_RECV sockets per LISTEN
  socket: 65535 Max SYN retries: 5
  Max SYN ACK retries:
5
Timewait specific
information:
  Max timewait sockets:
180000 Current
  timewait sockets: 0
  Timewait recycle: 0
  Reuse timewait
port: 0 Keepalive
information:
  Keepalive on: 0
  Idle period: 900
  seconds Interval:
75 seconds
  Max
probes:
6 MTU
probing:
  Enable mtu
```

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```

probing: 0 FIN
specific
information:
  FIN_WAIT_2 timeout: 60
seconds Orphan socket
information:
  Max orphans:
  16384 Max
  orphan
  retries: 0
Current orphans: 0

```

The following example shows TCP parameters.

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 10.12. show tcp pmtu

Use this command to display information about TCP PMTU.

```
show tcp pmtu [ local-ip a.b.c.d ] [ local-port num ] [ peer-ip a.b.c.d ] [ peer-port num ]
```

## Parameter Description

Parameter	Description
<b>local-ip</b> <i>a.b.c.d</i>	Local IP address.
<b>local-port</b> <i>num</i>	Local port.
<b>peer-ip</b> <i>a.b.c.d</i>	Peer IP address.
<b>peer-port</b> <i>num</i>	Peer port.

## Defaults



**Command Mode**

Privileged EXEC mode

**Usage Guide**      N/A**Configuration Examples**

```
QTECH# show tcp pmtu
Number  Local Address
QTECH# show tcp pmtu
Number  Local Address      Foreign Address      PMTU
1       192.168.195.212.23  192.168.195.112.13560 1440
```

The following example displays PMTU of IPv4 TCP connection.

Field	Description
Number	Sequence number.
Local Address	The local address and the port number. The number after the last "." is the port number. For example, in "2002::2.23" and "192.168.195.212.23", "23" is the port number.
Foreign Address	The remote address and the port number. The number after the last "." is the port number. For example, in "2002::2.23" and "192.168.195.212.23", "23" is the port number.
PMTU	PMTU value.

**Related Commands**

Command	Description
<b>ip tcp path-mtu-discovery</b>	Enables the TCP PMTU discovery function.

**Platform Description**

N/A

### 10.13. show tcp port

Use this command to display information about the current TCP port.

```
show tcp port [ num ]
```

#### Parameter Description

Parameter	Description
<i>num</i>	Port number

#### Defaults

N/A

#### Command Mode

Privileged EXEC mode

#### Usage Guide

N/A

#### Configuration Examples

```
QTECH#show tcp port
TCP connections on port 23:
Number  Local Address Foreign Address  State
1       1.1.1.1:23    1.1.1.2:64571   ESTABLISHED
Total: 1

TCP connections on port 2650:
Number  Local Address Foreign
Address                               State Total: 0
```

The following example displays the current IPv4 TCP port status.

Tcpv6 listen on 23 have total 1 connections.

Field	Description
Foreign Address	Remote address



State	<p>Status of the current TCP connection. There are eleven possible states:</p> <p>CLOSED: The connection has been closed.</p> <p>LISTEN: Listening state</p> <p>SYNSENT: In the three-way handshake phase when the SYN packet has been sent.</p> <p>SYNRCVD: In the three-way handshake phase when the SYN packet has been received.</p> <p>ESTABLISHED: The connection has been established. FINWAIT1: The local end has sent the FIN packet.</p> <p>FINWAIT2: The FIN packet sent by the local end has been acknowledged.</p> <p>CLOSEWAIT: The local end has received the FIN packet from the peer end.</p>
	<p>LASTACK: The local end has received the FIN packet from the peer end, and then sent its own FIN packet.</p> <p>CLOSING: The local end has sent the FIN packet from the peer end, and received the FIN packet from the peer end before the ACK packet for the peer end to respond with this FIN packet is received.</p> <p>TIMEWAIT: The FIN packet sent by the local end has been acknowledged, and the local end has also acknowledged the FIN packet.</p>

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 10.14. show tcp statistics

Use this command to show TCP statistics on received packets, three way handshake and time-wait.

show tcp parameter

### 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 shows TCP parameters.

```
QTECH#show tcp statistics TCP Packets
Received: 1103
Errors : 0(checksum: 0) Three way
handshake
Request queue overflow: 0 Accept
backlog full: 0
Web authentication limit per user: 0
Failed to alloc memory for request sock: 0

Failed to create open request child: 0 SYN ACK
retransmits: 0
Timeouted requests: 0 Time-wait
Time-wait bucket table overflow: 0
```

### Related Commands

### Platform Description

### Field Description

Field	Description
TCP Packets	Normal packets and error packets
Three way handshake	Three way handshake information, including session request count, server-client connection count, three way handshake failure count caused by Web authentication limit, TCP socket failure count caused by memory shortage, sub-session failure count, packet retransmission count and session failure count caused by retransmission timeout.
Time-wait	Session in TIMEWAIT state

Command	Description
N/A	N/A

N/A



## 11. IPV4/IPV6 REF COMMANDS

### 11.1. clear ip ref packet statistics

Use this command to clear IPv4 QTECH Express Forwarding (REF) packet statistics.

clear ip ref packet statistics

#### Parameter Description

Parameter	Description
N/A	N/A

Defaults N/A

#### Command Mode

Privileged EXEC mode

Usage Guide N/A

#### Configuration Examples

#### Related Commands

#### Platform Description

The following example clears IPv4 REF packet statistics.

```
QTECH #clear ip ref packet statistics
```

Command	Description
N/A	N/A

N/A

### 11.2. clear ipv6 ref packet statistics

Use this command to clear IPv6 REF packet statistics.

clear ipv6 ref packet statistics

## Parameter Description

Parameter	Description
N/A	N/A

Defaults N/A

Command Mode

Privileged EXEC mode

Usage Guide N/A

Configuration Examples

Related Commands

Platform Description

The following example clears IPv6 REF packet statistics.

```
QTECH #clear ipv6 ref packet statistics
```

Command	Description
N/A	N/A

N/A

### 11.3. hash-disturb

Use this command to enable hash disturbance factor. Use the no form of this command to disable settings.

hash-disturb *string*

no hash-disturb

#### Parameter Description

Parameter	Description
<i>string</i>	Enables disturbance factor.

Defaults



Hash disturbance factor is disabled by default.

## Command Mode

REF load balancing enhanced profile configuration mode

## Usage Guide

```
QTECH# configure terminal
QTECH(config)# ip-ref-load-balance-profile
QTECH(ref-ip-config-load-
balance-profile)# hash-disturb A
QTECH(ref-ip-config-load-
balance-profile)#
```

N/A

## Configuration Examples

The following example enables hash disturbance factor.

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 11.4. hash-symmetrical

Use this command to enable hash symmetrical factor. Use the **no** form of this command to disable settings.

```
hash-symmetrical { ipv4 | ipv6 | fcoe }
```

```
no hash-symmetrical { ipv4 | ipv6 | fcoe }
```

## Parameter Description

Parameter	Description
ipv4	Enables hash symmetrical factor for IPv4



	packets.
ipv6	Enables hash symmetrical factor for IPv6 packets.
fcoe	Enables hash symmetrical factor for FCoE packets.

### Defaults

The defaults vary with different products.

### Command Mode

REF load balancing enhanced profile configuration mode

### Usage Guide

N/A

### Configuration Examples

The following example disables hash symmetrical factor for IPv6 and FCoE packets.

```
QTECH# configure terminal
QTECH(config)# ip-ref-load-balance-profile
QTECH(ref-ip-config-load-balance-profile)# no hash-symmetrical ipv6
QTECH(ref-ip-config-load-balance-profile)# no hash-symmetrical fcoe
```

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 11.5. ip ref load-sharing original

Use this command to configure the algorithm that is used for load balancing during forwarding based on the source and destination IPv4 addresses. Use the **no** form of this command to restore the default setting.

ip ref load-sharing original no ip ref load-sharing original

### Parameter Description



Parameter	Description
N/A	N/A

### Defaults

The default algorithm is based on the destination IPv4 address.

### Command Mode

Global configuration mode

### Usage Guide

The REF is responsible for data forwarding and supports two load balancing algorithms. One is based

on destination IP addresses and the other is based on the source and destination IP addresses. When IP packets are forwarded on multiple paths, for example, when load balancing based on destination IP addresses is configured, the REF forwards packets based on a path matching the destination IP address of packets. By default, load balancing based on destination IP addresses is used.

### Configuration Examples

#### Related Commands

#### Platform Description

The following example configures the load balancing algorithm based on source and destination IP addresses.

```
QTECH(config)# ip ref load-sharing original
```

The following example configures the load balancing algorithm based on destination IP addresses of packets.

```
QTECH(config)# no ip ref load-sharing original
```

Command	Description
N/A	N/A

N/A

### 11.6. ip ref load-balance

Use this command to configure ECMP load balancing algorithm. Use the **no** or **default** form of this command to restore the default setting.

```
ip ref load-balance [ src-dst-ip | src-ip | src-ip-src-dst-l4port | src-dst-ip-src-dst-l4port ]
```

**no ip ref load-balance**

## Parameter Description

Parameter	Description
src-dst-ip	Configures ECMP load balancing based on the source and destination IP address. The packets containing the same source and destination IP address are routed over the same link. This algorithm is recommended for a layer-3 network scenario.
src-ip	Configures ECMP load balancing based on the source IP address. The packets containing the same source IP address are routed over the same link.
src-ip-src-dst-l4port	Configures ECMP load balancing based on the source IP address, layer-4 source port and layer-4 destination port. The packets containing the same the source IP address, layer-4 source port and layer-4 destination port are routed over the same link. The other packets are evenly distributed over ECMP paths.
src-dst-ip-src-dst-l4port	Configures ECMP load balancing based on the source IP address, destination IP address, layer-4 source port and layer-4 destination port.

**Defaults**

ECMP load balancing is based on the source and the destination IP address by default.

**Command Mode**

Global configuration mode

**Usage Guide****Configuration Examples****Related Commands**

## Platform Description

The following example configures ECMP load balancing based on the destination IP address.

```
QTECH(config)# ip ref load-balance dst-ipe
```

The following example restores the default ECMP load balancing algorithm.

```
QTECH(config)# no ip ref load-balance
```

Command	Description
N/A	N/A

N/A

## 11.7. ip ref hash-elasticity enable

Use this command to enable ECMP elastic hash. Use the **no** or **default** form of this command to restore the default setting.

ip ref hash-elasticity enable

**no ip ref hash-elasticity enable**

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

ECMP elastic hash is disabled by default.

### Command Mode

Global configuration mode

### Usage Guide

N/A

### Configuration Examples

The following example enables ECMP elastic hash.

```
ip ref hash-elasticity enable
```

The following example disables ECMP elastic hash.

```
no ip ref hash-elasticity enable
```

**Related Commands**

Command	Description
N/A	N/A

**Platform Description**

N/A

**11.8. ipv6 ref load-sharing original**

Use this command to configure the algorithm that is used for load balancing during forwarding based on the source and destination IPv6 addresses. Use the no form of this command to restore the default setting.

```
ipv6 ref load-sharing original
```

```
no ipv6 ref load-sharing original
```

**Parameter Description**

Parameter	Description
N/A	N/A

**Defaults**

The default algorithm is based on the destination IPv6 address.

**Command Mode**

Global configuration mode

**Usage Guide**

N/A

**Configuration Examples****Related Commands****Platform Description**

The following example restores the algorithm that is used for load balancing during forwarding to the default setting.

```
QTECH(config)#no ipv6 ref load-sharing original
```





Command	Description
N/A	N/A

N/A.

## 11.9. show ip ref adjacency

Use this command to display the information about the specified adjacent node or all adjacent nodes. **show ip ref adjacency** [ **glean** | **local** | *ip-address* | **interface** *interface\_type interface\_number* | **discard** | **statistics** ]

### Parameter Description

Parameter	Description
<b>glean</b>	Aggregate adjacent node, which is used for a direct route
<b>local</b>	Local adjacent node, which is used by the local host
<i>ip-address</i>	Next-hop IP address
<i>interface_type</i>	Interface type
<i>interface_number</i>	Interface number
<b>discard</b>	Displays discarded adjacent nodes.
<b>statistics</b>	Statistics

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command can be used to display the information about the adjacent node table in the current REF module. By specifying parameters, the information about the aggregate

adjacent node, local adjacent node, adjacent node of the specified IP address, adjacent node associated with the specified interface, and all adjacent nodes can be displayed.

## Configuration Examples

The following example displays the information about all adjacent nodes in the adjacent node table.

```
QTECH#show ip ref adjacency
id state      type   rfct chg ip          interface      linklayer(header data)
1  unresolved mcast  1    0  224.0.0.0
9  resolved  forward 1    0  192.168.50.78 GigabitEthernet 0/0 00 25 64 C5 9D 6A 00
D0 F8 98 76 54 08 00
7  resolved  forward 1    0  192.168.50.200 GigabitEthernet 0/0 00 04 5F 87
69 66 00 D0 F8 98 76 54 08 00
```

Field	Description
id	Adjacent node ID
state	Adjacent node state: Unresolved Resolved
type	Adjacent node type Local: local adjacency Forward: forward adjacency Discard: discard adjacency Glean: glean adjacency Mcast: multicast adjacency
rfct	Reference count of the adjacent node
chg	Whether the adjacent node is on the changing link.
ip	IP address of the adjacent node
interface	Interface
linklayer	Layer 2 head

## Related Commands

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

show ip ref route	Displays all route information in the current REF module.
-------------------	-----------------------------------------------------------

### Platform Description

N/A

## 11.10. show ip ref exact-route

This command is used to display the IPv4 REF exact route.

**show ip ref exact-route** [ *oob* | *vrf vrf\_name* ] *source\_ipaddress dest\_ipaddress*

### Parameter Description

Parameter	Description
<i>oob</i>	Out of band, namely, the network that the management interface belongs to, supported only by the device supporting the management interface.
<i>vrf vrf_name</i>	VRF name, supported only by the VRF-supported device.
<i>source_ipaddress</i>	Source IP address of the packet
<i>dest_ipaddress</i>	Destination IP address of the packet

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command is used to specify the source and the destination IP address of the IP packets, and to display the path of forwarding the current packet with REF

### Configuration Examples

The following example displays the IPv4 REF exact route from 192.168.217.74 to 192.168.13.1.

```
QTECH# show ip ref exact-route 192.168.217.74 192.168.13.1
```



```
192.168.217.74 --> 192.168.13.1 (vrf global):
id state      type      rfct chg ip      interface      linklayer(header
data)
9  resolved forward 1      0   192.168.17.1 GigabitEthernet 0/0 00 25 64 C5 9D
6A 00 D0 F8 98 76 54 08 00
```

**Description of fields:**

Field	Description
id	Adjacency ID
state	Adjacency state: Unresolved Resolved
type	Adjacency type Local: local adjacency Forward: forward adjacency Discard: discard adjacency Glean: glean adjacency Mcast: multicast adjacency
rfct	Reference count of the adjacency
chg	Whether the adjacency is on the changing link.
ip	Adjacency IP address
interface	Interface
linklayer	Layer 2 head

**Related Commands**

Command	Description
show ip ref route	Displays all routing information in the current REF module.

**Platform Description**

N/A



## 11.11. show ip ref packet statistics

Use this command to display IPv4 REF packet statistics.

```
show ip ref packet statistics
```

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH #show ip ref pkt-statistic ref packet
statistic:
  bad head      : 0
  lookup fib fail : 0
```

The following example displays IPv4 REF packet statistics.

Field	Description
total recved	Number of total packets received by REF
bad head	Number of the packets with false header
lookup fib fail	Number of the packets with failed REF routing
drop adj	Number of the packets matching the dropped adjacency

local adj	Number of the packets matching the local adjacency
glean adj	Number of the packets matching the gleaned adjacency
forward	Number of the packets matching the forwarded adjacency
no ip routing	Number of the packets not allowed to be forwarded and sent to local.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 11.12. show ip ref resolve-list

Use this command to display the IPv4 REF resolution information.

show ip ref resolve-list

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command

Privileged EXEC mode

### Mode

## Usage Guide

N/A

## Configuration Examples

## Related Commands

## Platform Description

The following example displays IPv4 REF resolution information.

```
QTECH#show ip ref resolve-list
IP           res_state flags interface
1.1.1.1     unres    1    GigabitEthernet 0/0
```

Field	Description
IP	IP address
res_state	unres: unresolved res: resolved
flags	0: related to adjacency 1: unrelated to adjacency
interface	Interface

Command	Description
N/A	N/A

N/A

## 11.13. show ip ref route

Use this command to display all the routing information in the IPv4 REF table.

```
show ip ref route [ oob | vrf vrf_name ] [ default | ip mask | statistics ]
```

## Parameter Description

Parameter	Description
<b>oob</b>	Out of band, namely, the network that the management interface belongs to, supported only by the device supporting the management interface.
<b>vrf vrf_name</b>	VRF name, supported only by the VRF-supported device.
<b>default</b>	Specifies the default route.
<i>ip</i>	Specifies the destination IP address of the route
<i>mask</i>	Specifies the mask of the route.
<b>statistics</b>	Statistics

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command is used to display the related routing information on the current REF table, and specify the default route and all the routing information matching IP/MASK.

### Configuration Examples

The following example displays all the routing information in the IPv4 REF table.

```
QTECH#show ip ref route Codes: * - default route
      # - zero route
ip    mask  weight path-id  next-hop  interface
255.255.255.255 255.255.255.255 1 4    0.0.0.0  Local 0

192.168.50.0 255.255.255.0 1 6 0.0.0.0 FastEthernet 0/0
192.168.50.255 255.255.255.255 1 2    0.0.0.0
192.168.50.200 255.255.255.255 1 7 192.168.50.200 FastEthernet 0/0
192.168.50.122 255.255.255.255 1 4 0.0.0.0      Local 0
192.168.50.78 255.255.255.255 1 9 192.168.50.78 FastEthernet 0/0
```



224.0.0.0	240.0.0.0	1	224.0.0	
		1	.0	
224.0.0.0	255.255.255	:	4	0.0.0.0
	.0			Local
				0

Field	Description
ip	Destination IP address
mask	Mask
path-id	Adjacent identity
next-hop	Address of next hop
weight	Routing weight
interface	Egress

### Related Commands

Command	Description
show ip ref exact-route	Displays the accurate REF forwarding path of an IP packet.

### Platform Description

N/A

## 11.14. show ipv6 ref adjacency

Use this command to display the information about the IPv6 adjacent node.

```
show ipv6 ref adjacency [glean | local | ipv6-address | interface interface_type
interface_number |
discard | statistics ]
```

### Parameter Description

Parameter	Description
glean	Aggregate adjacent node, which is used for a direct route
local	Local adjacent node, which is used by the

	local host
<i>ipv6-address</i>	Next-hop IP address
<i>interface_type</i>	Interface type
<i>interface_number</i>	Interface number
discard	Displays discarded adjacent nodes.
statistics	Statistics

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

This command can be used to display the information about the adjacent node table in the privileged EXEC mode and global configuration mode.

### Configuration Examples

```
QTECH#show ipv6 ref adjacency
Id      state      type      rfct chg ip      interface      linklayer(header
data)
1 unresolved glean    1      0   :: GigabitEthernet 0/0
2 unresolved local    2      0   :: Local 1
```

The following example displays the information about the IPv6 adjacent node..

### Related Commands

Description of fields:

Field	Description
id	Adjacent node ID
state	Adjacent node state: Unresolved Resolved

type	Adjacent node type Local: local adjacency Forward: forward adjacency Discard: discard adjacency Glean: glean adjacency Mcast: multicast adjacency
rfct	Reference count of the adjacent node
chg	Whether the adjacent node is on the changing link.
ip	IP address of the adjacent node
interface	Interface
linklayer(header data)	Layer 2 head

For distributed routers, id is divided into two fields, namely, gid and lid, standing for global adjacent node ID and local adjacent node ID respectively.

Command	Description
N/A	N/A

### Platform Description

N/A

### 11.15. show ipv6 ref exact-route

This command is used to display the IPv6 REF exact route.

```
show ipv6 ref exact-route [ oob | vrf vrf_name ] source-ipv6-address destination-ipv6-address
```

### Parameter Description

Parameter	Description
oob	Out of band, namely, the network that the management interface belongs to, supported only by the

	device supporting the management interface.
<i>vrf vrf_name</i>	VRF name, supported only by the VRF-supported device.
<i>source-ipv6-address</i>	Source IP address of the packet
<i>destination-ipv6-address</i>	Destination IP address of the packet

**Defaults**

N/A

**Command Mode**

Privileged EXEC mode

**Usage Guide**

N/A

**Configuration Examples**

The following example displays the IPv4 REF exact route from 2001:db8:1::1 to 3001:db8:2::2.

```
QTECH#show ipv6 exact-route 2001:db8:1::1 3001:db8:2::2
2001:db8:1::1 --> 3001:db8:2::2 (vrf global):
ID state      type  rfct chgip interface          linklayer(header data)
3  unresolve  glean  1   0   :: GigabitEthernet 0/0
```

**Description of fields:**

Field	Description
id	Adjacent node ID
state	Adjacent node state: Unresolved Resolved



<b>type</b>	<b>Adjacent node type Local: local adjacency</b> <b>Forward: forward adjacency Discard: discard adjacency Glean: glean adjacency</b> <b>Mcast: multicast adjacency</b>
rfct	Reference count of the adjacent node
chg	Whether the adjacent node is on the changing link.
ip	IP address of the adjacent node
interface	Interface
linklayer(header data)	Layer 2 head

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 11.16. show ipv6 ref packet statistics

Use this command to display IPv6 REF packet statistics.

show ipv6 ref packet statistics

### 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 IPv6 REF packet statistics.

```
QTECH#show ipv6 ref packet statistics ref packet
statistic:
bad head          : 0 lookup fib
fail : 0 local adj : 0
glean adj         : 0
```

Field	Description
bad head	Number of the packets with false header
lookup fib fail	Number of the packets with failed REF routing
drop adj	Number of the packets matching the dropped adjacency
local adj	Number of the packets matching the local adjacency
glean adj	Number of the packets matching the gleaned adjacency
forward	Number of the packets matching the forwarded adjacency
no ip routing	Number of the packets not allowed to be forwarded and sent to local.

## Related Commands

--	--

Command	Description
N/A	N/A

### Platform Description

N/A

## 11.17. show ipv6 ref resolve-list

This command is used to display the IPv6 REF resolution information.

### show ipv6 ref resolve-list

### Parameter Description

Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

### Privileged EXEC mode

### Usage Guide

N/A

### Configuration

The following example displays IPv6 REF resolution information.

### Examples

```
QTECH#show ipv6 ref resolve-list
IP                res_state flags interface
1000::1          unres 1      GigabitEthernet 0/0
```

Field	Description
IP	IPv6 address

res_state	unres: unresolved res: resolved
flags	0: related to adjacency 1: unrelated to adjacency
interface	Interface

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A

## 11.18. show ipv6 ref route

Use this command to display all the routing information in the IPv6 REF table.

```
show ipv6 ref route [ oob | vrf vrf-name ] [ default | statistics | prefix/len ]
```

### Parameter Description

Parameter	Description
<b>oob</b>	Out of band, namely, the network that the management interface belongs to, supported only by the device supporting the management interface.
<b>vrf <i>vrf_name</i></b>	VRF name, supported only by the VRF-supported device.
<b>default</b>	Specifies the default route.
<b>statistics</b>	Statistics
<b>prefix/len</b>	Displays the route with the specified prefix (X:X:X:X::X/<0-128>).

### Defaults

N/A

### Command Mode



## Usage Guide

This command is used to display all routing information in the IPv6 REF table. If there is no VRF parameter, information about the global REF table is displayed; if there is VRF parameter, information about the specified VRF table is displayed. The command can also be used to display information

about the default route, the route with the specified prefix, and statistics of all types of routes.

## Configuration Examples

```
QTECH#show ipv6 ref route
Codes: * - default route
prefix/len                weight path_id    next_hop interface
2001:da8:ffe:2::/64       19     39           ::   GigabitEthernet 0/0
2001:da8:ffe:2::3/128    19     2            :::1 Local 1
fe80::/10                 1      6            ::   Null 0
fe80::21a:a9ff:fe3b:fa41/128 1      2            :::1 Local 1
```

The following example displays all the routing information in the REF IPv6 table.

Field	Description
prefix/len	IPv6 prefix and prefix length.
path-id	Adjacent identity
next-hop	Address of next hop
weight	Routing weight
interface	Interface

## Related Commands

Command	Description
N/A	N/A

## Platform Description

N/A

## 11.19. show ip ref load-balance

Use this command to display ECMP load balancing configuration.

```
show ip ref load-balance
```



Parameter	Description
N/A	N/A

### Defaults

N/A

### Command Mode

Privileged EXEC mode

### Usage Guide

N/A

### Configuration Examples

```
QTECH#  
QTECH#show ip ref load-balance  
load-balance          : src-dst-ip.  
hash-elasticity      : enable.  
QTECH#
```

The following example displays ECMP load balancing configuration..

Field	Description
load-balance	ECMP load balancing algorithm
hash-elasticity	Enable: Enable elastic hash. Disable: Disable elastic hash.

### Related Commands

Command	Description
N/A	N/A

### Platform Description

N/A