IP Address & Application Commands

1 IP Address/Service Commands

1.1 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**] | [**slave**]

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

Parameter Description

Parameter	Description
ip-address	32-bit IP address, with 8 bits in one group in decimal format. Groups are separated by dots.
network-mask	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.
slave	Slave IP address.
secondary	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 Orion Alpha software supports multiple IP address for an interface, in which one is the primary IP address and others are the secondary/slave 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.

Slave IP address is applied to the gateway cluster scenario. Only after the primary IP address is configured can the slave IP address be configured. Both slave and primary addresses are configured on an Layer 3 interface, backing up each other. In general, the master device adopts the primary IP address and the slave device uses the slave IP address. When the slave device becomes the master, its IP address becomes the primary IP address. When the master device turns into a slave, its IP address becomes the salve IP address,

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 .

```
Orion Alpha A28X(config-if)# ip address 10.10.10.1 255.255.255.0
```

The following example configures the master and slave IP addresses as 10.10.10.1/24 and 10.10.20.1/24 respectively.

```
Orion Alpha A28X(config)# interface gigabitEthernet 0/1
Orion Alpha A28X(config-if-GigabitEthernet 0/1)# ip address 10.10.10.1
255.255.255.0
Orion Alpha A28X(config-if-GigabitEthernet 0/1)# ip address 10.10.20.1
255.255.255.0 slave
```

Related Commands

Command	Description
show interface	Displays detailed information of the interface.

Platform Description

N/A

1.2 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
ip-address	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 Orion Alpha 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.

```
Orion Alpha A28X(config)# interface gigabitEthernet 0/1
Orion Alpha A28X(config-if-GigabitEthernet 0/1)# ip broadcast-address
0.0.0.0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.3 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
access-list-number	(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, Orion Alpha 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.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# ip directed-broadcast
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

1.4 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
milliseconds	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.
bucket-size	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 The following example sets the rate to send the ICMP destination unreachable packets triggered by DF in the IP header to 100 per second.

```
Orion Alpha A28X(config)# ip icmp error-interval DF 1000 100
```

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

```
Orion Alpha A28X(config)# ip icmp error-interval 1000 10
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.5 ip mask-reply

Use this command to configure the Orion Alpha 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.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# ip mask-reply
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

1.6 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
bytes	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 Orion Alpha 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 iexample sets the IP MTU value of the fastEthernet 0/1 interface to 512 bytes.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# ip mtu 512
```

Related Commands

Command	Description
mtu	Sets the MTU value of an interface.

Platform Description

N/A

1.7 ip redirects

Use this command to allow the Orion Alpha 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 The following example disables ICMP redirection for the fastEthernet 0/1 interface.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# no ip redirects
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

1.8 ip source-route

Use this command to allow the Orion Alpha 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 Orion Alpha 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 The following example disables the IP source route.

```
Orion Alpha A28X(config)# no ip source-route
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.9 ip ttl

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

Parameter Description

Parameter	Description
value	Sets the TTL value of the unicast packet, in the range from 0 to 255.

Defaults The default is 64.

Command Mode Global configuration mode

Usage Guide N/A

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

```
Orion Alpha A28X(config)# ip ttl 100
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.10 ip unreachables

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

ip unreachables

no ip unreachables

Parameter Description

Parameter	Description
N/A	N/A

Defaults This function is enabled by default.

Command Interface configuration mode.

Mode

Usage Guide Orion Alpha 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.

Orion Alpha 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.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# no ip unreachables
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.11 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
interface-type	Specifies interface type.
interface-number	Specifies interface number.
brief	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 Privileged EXEC mode.

Usage Guide When an interface is available, Orion Alpha will create a direct route in the routing table. The interface is available in that the Orion Alpha software can receive and send packets through this interface. If the interface changes from available status to unavailable status, the Orion Alpha 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 exmaple displays the output of the **show ip interface brirf command**.

```
Orion Alpha A28X#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 **up**, **down**, or **administratively down**.
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 unreachabled 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 fash 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

Related Commands	**Command**	**Description**
	N/A.	N/A.

Platform Description N/A.

1.12 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 The following example displays the statistics of IP packet queues.

Products do not support the VRF parameter. The following example is for reference purpose. Please take the actual product as the standard.

```
Orion Alpha A28X#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 efbuf: 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

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

1.13 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
interface-name	Interface name
total	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.

```
R1#show ip packet statistics
Total
  Received 113962 packets, 11948991 bytes
    Unicast:90962,Multicast:5232,Broadcast:17768
    Discards:0
      HdrErrors:0(BadChecksum:0,TTLExceeded:0,Others:0)
      NoRoutes:0
      Others:0
  Sent 34917 packets, 1863146 bytes
    Unicast:30678,Multicast:4239,Broadcast:0
GigabitEthernet 0/1
  Received 6715 packets, 416587 bytes
    Unicast:2482,Multicast:4233,Broadcast:0
    Discards:0
      HdrErrors:0(BadChecksum:0,TTLExceeded:0,Others:0)
      NoRoutes:0
      Others:0
  Sent 6720 packets, 417096 bytes
    Unicast:2481,Multicast:4239,Broadcast:0
Loopback 0
  Received 0 packets, 0 bytes
    Unicast:0,Multicast:0,Broadcast:0
    Discards:0
      HdrErrors:0(BadChecksum:0,TTLExceeded:0,Others:0)
      NoRoutes:0
      Others:0
  Sent 0 packets, 0 bytes
    Unicast:0,Multicast:0,Broadcast:0
Tunnel 1
  Received 0 packets, 0 bytes
    Unicast:0,Multicast:0,Broadcast:0
```

```
    Discards:0
      HdrErrors:0(BadChecksum:0,TTLExceeded:0,Others:0)
      NoRoutes:0
      Others:0
  Sent 21584 packets, 1122848 bytes
Unicast:21584,Multicast:0,Broadcast:0
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

1.14 show ip raw-socket

Use this command to display IPv4 raw sockets.

show ip raw-socket [*num*]

Parameter Description	Parameter	Description
	num	Protocol.

Defaults N/A.

Command Mode Priviledged EXEC mode.

Usage Guide N/A.

Configuration Examples The following example displays all IPv4 raw sockets.

```
Orion Alpha A28X# 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
```

Field Description

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

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

1.15 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 Examples The following displays all IPv4 sockets.

```
Orion Alpha A28X# show ip sockets
Number Process name     Type     Protocol LocalIP:Port  ForeignIP:Port
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      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.elf    DGRAM    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     snmpd         DGRAM    UDP      0.0.0.0:14800 0.0.0.0:0
*
12     sshd          STREAM   TCP      0.0.0.0:22    0.0.0.0:0
LISTEN
13     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

1.16 show ip udp

Use this command to display IPv4 UDP sockets.

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

Use this command to display IPv4 UDP socket statistics.

show ip udp statistics

Parameter Description

Parameter	Description
local-port *num*	Local port number

Defaults N/A.

Command Mode Privileged EXEC mode.

Usage Guide N/A.

Configuration Examples The following example displays all IPv4 UDP sockets.

```
Orion Alpha A28X# show ip udp
Number Local Address         Peer Address          Process name
1      0.0.0.0:68            0.0.0.0:0             dhcpc.elf
2      0.0.0.0:161           0.0.0.0:0             snmpd
3      0.0.0.0:2000          0.0.0.0:0             wbav2
4      0.0.0.0:3333          0.0.0.0:0             vrrp_plus.elf
```

```
5       0.0.0.0:3503            0.0.0.0:0               mpls.elf
6       0.0.0.0:3799            0.0.0.0:0               rds_other_th
7       0.0.0.0:14800           0.0.0.0:0               snmpd
```

Field Description

Field	Description
Number	Number.
Local Address	Local IP address and port.
Peer Address	Peer IP address and port.
Process name	Process name.

Related Commands

Command	Description
N/A	N/A

Platform Description

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 *ip-address MAC-address type* [**alias**]

no arp *ip-address MAC-address type* [**alias**]

Parameter Description

Parameter	Description
ip-address	The IP address that corresponds to the MAC address. It includes four parts of numeric values in decimal format separated by dots.
MAC-address	48-bit data link layer address
type	ARP encapsulation type. The keyword is arpa 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 Orion Alpha 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 The following example sets an ARP static mapping record for a host in the Ethernet.

```
Orion Alpha A28X(config)# arp 1.1.1.1 4e54.3800.0002 arpa
```

Related Commands

Command	Description
clear arp-cache	Clears the ARP cache table

Platform Description N/A

2.2 arp anti-ip-attack

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. Use the **arp anti-ip-attack** command to set the parameter or disable this function. 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
num	The number of the IP message to trigger the ARP to set the 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 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 The following example sets the IP message number that triggers to set the discarding entry as 5.

```
Orion Alpha A28X(config)# arp anti-ip-attack 5
```

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

```
Orion Alpha A28X(config)# arp anti-ip-attack 0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.3 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 Description

Parameter	Description
limit	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 not limited.

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

```
Orion Alpha A28X(config)# interface gi 0/0
Orion Alpha A28X(config-if-GigabitEthernet 0/0)# arp cache interface-limit 300
```

The following example restores the default setting.

```
Orion Alpha A28X(config)# interface gi 0/0
Orion Alpha A28X(config-if-GigabitEthernet 0/0)# no arp any-ip
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.4 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
seconds	The time interval to send the free ARP request message in the range from 1 to 3600 in the unit of seconds.

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.

```
Orion Alpha A28X(config)# interface vlan 1
Orion Alpha A28X(config-if)# arp gratuitous-send interval 1
```

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

```
Orion Alpha A28X(config)# interface vlan 1
Orion Alpha A28X(config-if)# no arp gratuitous-send
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.5 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
seconds	Time for retransmitting the ARP request message in the range from 1 to 3600 in the unit of seconds.

Defaults The default is 1.

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

```
Orion Alpha A28X(config)# arp retry interval 30
```

Related Commands

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

Platform Description N/A

2.6 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
	number	The times of sending the same ARP request in the range from 1 to100.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 The following example sets the local ARP request not to be retried.

```
Orion Alpha A28X(config)# arp retry times 1
```

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

```
Orion Alpha A28X(config)# arp retry times 2
```

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

Platform Description N/A

2.7 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
	secondsv	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.

Configuration The following example sets the timeout for the dynamic ARP mapping record that is learned

Examples dynamically from FastEthernet port 0/1 to 120 seconds.

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# arp timeout 120
```

Related Commands

Command	Description
clear arp-cache	Clears the ARP cache list.
show interface	Displays the interface information.

Platform Description N/A

2.8 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
number	Maximum number of trusted ARP entries.

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 The following example sets 1000 trusted ARPs.

```
Orion Alpha A28X(config)# arp trusted 1000
```

Related Commands

Command	Description
service trustedarp	Enables the trusted ARP function.

Platform Description N/A

2.9 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

Parameter	Description

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 N/A

Related Commands

Command	Description
service trustedarp	Enables trusted ARP function.

Platform Description N/A

2.10 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 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.

```
Orion Alpha A28X(config)# arp trusted user-vlan 3 translated-vlan 5
```

Related Commands

Command	Description
service trustedarp	Enables the trusted ARP function.

Platform Description N/A

2.11 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.

```
Orion Alpha A28X(config)# interface gi 0/0
Orion Alpha A28X(config-if-GigabitEthernet 0/0)# arp trust-monitor enable
```

The following example disables engress gateway trusted ARP.

```
Orion Alpha A28X(config)# interface gi 0/0
Orion Alpha A28X(config-if-GigabitEthernet 0/0)# no arp trust-monitor
enable
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.12 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
number	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.

```
Orion Alpha A28X(config)# arp unresolve 500
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.13 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 [**trusted**] [*ip* [*mask*]] | **interface** *interface-name*]

Parameter Description

Parameter	Description
trusted	Deletes trusted ARP entries. Dynamic ARP entries are deleted by default.
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 *interface-name*	Deletes dynamic ARP entries on the specified interface. Dynamic ARP entries are deleted on all interfaces by default.

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 The following example deletes all dynamic ARP mapping records.

```
Orion Alpha A28X# clear arp-cache
```

The following deletes the dynamic ARP entry 1.1.1.1.

```
Orion Alpha A28X# clear arp-cache 1.1.1.1
```

The following example deletes the dynamic ARP entry on interface SVI1.

```
Orion Alpha A28X# clear arp-cache interface Vlan 1
```

Related Commands

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

Platform Description N/A

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

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# ip proxy-arp
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.15 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 The following example enables local proxy ARP on VLAN1.

```
Orion Alpha A28X(config)# interface vlan 1
Orion Alpha A28X(config-if-VLAN 1)# local-proxy-arp
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

2.16 service trustedarp

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

service trustedarp

no service trustedarp

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

```
Orion Alpha A28X(config)# service trustedarp
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

2.17 show arp

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

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

Parameter Description

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

```
Orion Alpha A28X# 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 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

The following example displays the output result of show arp 192.168.195.68

```
Orion Alpha A28X# 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
```

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

```
Orion Alpha A28X# 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** 001a.a0b5.378d

```
Orion Alpha A28X# show arp 001a.a0b5.378d
Protocol Address Age(min) Hardware Type Interface
Internet 192.168.195.67 4 001a.a0b5.378d arpa VLAN 1
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

2.18 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:

```
Orion Alpha A28X#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

2.19 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*]] | [*ip* [*mask*] | *mac-address* | **static** | **complete** | **incomplete**]

Parameter Description

Parameter	Description
interface-type interface-number	Displays the ARP of the layer 2 port or the layer 3 interface.
trusted	Displays the trusted ARP entries. Currently, only the global VRF supports the trusted ARP.
ip	Displays the ARP entry of the specified IP address.
ip mask	Displays the ARP entries of the network segment included within the mask.
mac-address	Displays the ARP entry of the specified MAC address.
static	Displays all the static ARP entries.
complete	Displays all the resolved dynamic ARP entries.
incomplete	Displays all the unresolved dynamic ARP entries.

Defaults N/A

Command Mode Privileged EXEC 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 g*reater than *max_value*, no error message is prompted. Instead, ARP entries corresponding to the subvlan are displayed.

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

Examples

```
Orion Alpha A28X# show arp detail
IP Address MAC Address Type Age(min) Interface Port
20.1.1.1 000f.e200.0001 Static -- -- --
20.1.1.1 000f.e200.0001 Static -- Vl3 --
20.1.1.1 000f.e200.0001 Static -- Vl3 Gi2/0/1
193.1.1.70 00e0.fe50.6503 Dynamic 1 Vl3 Gi2/0/1
192.168.0.1 0012.a990.2241 Dynamic 10 Gi2/0/3 Gi2/0/3
192.168.0.1 0012.a990.2241 Dynamic 20 Ag1 Ag1
192.168.0.1 0012.a990.2241 Dynamic 30 Vl2 Ag2
192.168.0.39 0012.a990.2241 Local -- Vl3 --
192.168.0.39 0012.a990.2241 Local -- Gi2/0/3 --
192.168.0.1 0012.a990.2241 Local -- Vl3 --
192.168.0.1 0012.a990.2241 Local -- Gi2/3/2 --
```

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

```
Orion Alpha A28X# 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          Vl2        Te2/1
4         300
1.1.1.1          00d0.f822.33bb    Local      --         Vl2        --
--
```

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
Location	Local: ARP entries are generated or learned on the local device. Remore: ARP entries are synced from a remote gateway.

Related

Command	Description

Commands	N/A	N/A

Platform Description N/A

2.20 show arp packet statistics

Use this command to display the statistics of ARP packets.

show arp packet statistics [*interface-name*]

Parameter Description	Parameter	Description
	interface-name	Displays the statistics of ARP packets on the specified interface.

Defaults N/A.

Command Mode Privileged EXEC mode.

Usage Guide N/A.

Configuration Examples The following example displays the output information of the command.

```
Orion Alpha A28X# show arp packet statistics
Interface Received Received Received Sent Sent
Name Requests Replies Others Requests Replies
--------- -------- -------- -------- -------- -------
VLAN 1 10 20 1 50 10
VLAN 2 5 8 0 10 10
VLAN 3 20 5 0 15 12
VLAN 4 5 8 0 10 10
VLAN 5 20 5 0 15 12
VLAN 6 20 5 0 15 12
VLAN 7 20 5 0 15 12
VLAN 8 5 8 0 10 10
VLAN 9 20 5 0 15 12
VLAN 10 20 5 0 15 12
VLAN 11 20 5 0 15 12
VLAN 12 20 5 0 15 12
```

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

Related Commands	Command	Description
	N/A.	N/A.

Platform Description N/A

2.21 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:

```
Orion Alpha A28X# show arp timeout
Interface arp timeout(sec)
---------------------- ----------------
VLAN 1  3600
```

Related Commands

Command	Description
N/A.	N/A.

Platform Description N/A

2.22 show ip arp

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

show ip arp

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 **show ip arp**:

```
Orion Alpha A28X# 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
```

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.

Related Commands

Command	Description
N/A.	N/A.

Platform Description N/A

3 IPv6 Commands

3.1 clear ipv6 neighbors

Use this command to clear the dynamic IPv6 neighbors.

clear ipv6 neighbors [*interface-id*]

Parameter Description

Parameter	Description
interface-id	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 The following example clears the dynamic IPv6 neighbors.

```
Orion Alpha A28X# clear ipv6 neighbors
```

Related Commands

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

Platform Description 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
iipv6-prefix	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.

ipv6-address	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.
prefix-length	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.
prefix-name	The general prefix name. Use the specified general prefix to generate the interface address.
sub-bits	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.
no ipv6 address *ipv6-prefix*/*prefix-length* **eui-64** can be used to delete the addresses configured with **ipv6 address** *ipv6-prefix*/*prefix-length* **eui-64**.

Configuration Examples

```
Orion Alpha A28X(config-if)# ipv6 address 2001:1::1/64
Orion Alpha A28X(config-if)# no ipv6 address 2001:1::1/64
Orion Alpha A28X(config-if)# ipv6 address 2002:1::1/64 eui-64
Orion Alpha A28X(config-if)# no ipv6 address 2002:1::1/64 eui-64
```

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

```
Orion Alpha A28X(config-if)# ipv6 address autoconfig default
Orion Alpha A28X(config-if)# no ipv6 address autoconfig
```

Related Commands

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

Platform Description N/A

3.4 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.

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 The following example enables the IPv6 function on an interface.

```
Orion Alpha A28X(config-if)# ipv6 enable
```

Related Commands

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

Platform Description N/A

3.5 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
prefix-name	The general prefix name.
pv6-prefix	The network prefix value of the general-prefix following the format defined in RFC4291.
prefix-length	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 The following example configures manually a general prefix as my-prefix.

```
Orion Alpha A28X(config)# ipv6 general-prefix my-prefix
2001:1111:2222::/48
```

Related Commands

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.

Platform Description N/A

3.6 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
N/A	N/A

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 The following example sets the default hopcount to 100.

```
Orion Alpha A28X(config)# ipv6 hop-limit 100
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.7 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
milliseconds	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.
bucket-size	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 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 Orion Alpha A28X 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

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

```
Orion Alpha A28X(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.

```
Orion Alpha A28X(config)# ipv6 icmp error-interval 1000 10
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

3.8 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
bytes	MTU of IPv6 packets, in bytes. The value ranges from 1280 to 1500.

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 Orion Alpha 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

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

```
Orion Alpha A28X(config)# interface fastEthernet 0/1
```

```
Orion Alpha A28X(config-if)# ipv6 mtu 1400
```

Related Commands	Command	Description
	mtu	Sets the MTU of an interface.

Platform Description This command cannot be used on Layer 2 devices.

3.9 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
	value	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.

```
Orion Alpha A28X(config)# interface GigabitEthernet 0/1
Orion Alpha A28X(config-if-GigabitEthernet 0/1)# ipv6 nd cache interface-limit 100
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

3.10 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
value	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 The following example sets the number of the NS packets to 3.

```
Orion Alpha A28X(config-if)# ipv6 nd dad attempts 3
```

Related Commands

Command	Description
show ipv6 interface	Displays the interface information.

Platform Description N/A

3.11 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
value	Sets the interval for address conflict detection, 60 seconds by default. Setting *value* to 0 indicates that the function is disabled.

Defaults N/A

Command Mode Global configuration 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 The following example sets the interval for address conflict detection to 10s.

```
Orion Alpha A28X(config)# ipv6 nd dad retry 10
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

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

```
Orion Alpha A28X(config-if)# ipv6 nd managed-config-flag
```

Related Commands

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.

Platform Description N/A

3.13 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
	milliseconds	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 1000 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 The following example sets the interval for the interface to retransmitting NS to 2,000 seconds.

```
Orion Alpha A28X(conifig-if)# ipv6 nd ns-interval 2000
```

Related Commands	Command	Description
	show ipv6 interface	Displays the interface information.

Platform Description N/A

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

```
Orion Alpha A28X(config-if)# ipv6 nd other-config-flag
```

Related Commands	Command	Description
	show ipv6 interface	Displays the interface information.

Platform Description N/A

3.15 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**]] **|** [pool *pool-name* **]]**

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

Parameter Description

Parameter	Description
ipv6-prefix	IPv6 network ID following the format defined in RFC4291
prefix-length	Length of the IPv6 prefix. "/" shall be added in front of the prefix
valid-lifetime	Valid lifetime of the RA prefix received by the host
preferred-lifetime	Preferred lifetime of the RA prefix received by the host
at valid-date preferred-date	Sets the dead line for the valid lifetime and that of the preferred lifetime, in day, month, year, hour, minute.
infinite	Indicates that the prefix is always valid.
default	Sets the default prefix.
no-advertise	The prefix will not be advertised by the device.
off-link	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.
no-autoconfig	Indicates that the RA prefix received by the host cannot be used for auto address configuration.
pool pool-name	Indicates the IPv6 prefix pool

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.

```
Orion Alpha A28X(config)# interface vlan 1
Orion Alpha A28X(conifig-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):

```
Orion Alpha A28X(config)# interface vlan 1

Orion Alpha A28X(config-if)# ipv6 prefix default no-autoconfig
```

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

Related Commands

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

Platform Description

N/A

3.16 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
value	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

The following example sets the hopcount of the RA message.

```
Orion Alpha A28X(config -if)# ipv6 nd ra-hoplimit 110
```

Related Commands

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-mtu	Sets the MTU of the RA message.

Platform Description N/A

3.17 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-interva l

Parameter Description

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

```
Orion Alpha A28X(conifig-if)# ipv6 nd ra-interval 110
Orion Alpha A28X(config-if)# 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 hopfcount of the RA message.
ipv6 nd ra-mtu	Sets the MTU of the RA message.

Platform Description N/A

3.18 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
seconds	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 1800.

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 The following example sets the device lifetime of the RA sent on the interface.

```
Orion Alpha A28X(conifig-if)# ipv6 nd ra-lifetime 2000
```

Related Commands

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.

Platform Description N/A

3.19 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
value	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 The following example sets the MTU of the RA message.

```
Orion Alpha A28X(config -if)# ipv6 nd ra-mtu 1400
```

Related Commands	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.

Platform Description N/A

3.20 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
	milliseconds	Reachable time for the neighbor in the range from 0 to 3600000 in the unit of milliseconds.

Defaults The default value in RA is 0 (unspecified); the reachable time for the neighbor is 30000 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.
According to RFC4861, the actual time to reach neighbor is not consistent with the configured value, ranging from 0.5*configured value to 1.5*configured value.

Configuration Examples The following example sets the reachable time.

```
Orion Alpha A28X(config-if)# ipv6 nd reachable-time 1000000
```

Related Commands	Command	Description
	show ipv6 interface	Displays the interface information.

Platform Description N/A

3.21 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
Seconds	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 Global 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.

```
Orion Alpha A28X(config)# ipv6 nd stale-time 600
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

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

```
Orion Alpha A28X(config-if)# ipv6 nd suppress-ra
```

Related Commands

Command	Description
show ipv6 interface	Displays the interface information.

Platform N/A

Description

3.23 ipv6 nd unresolved

Description

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

```
Orion Alpha A28X(config)# ipv6 nd unresolved 200
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.24 ipv6 neighbor

Description

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
ipv6-address	The neighbor IPv6 address, in the form as defined in RFC4291.
interface-id	Specifies the network interface where the neighbor is (including Router Port, L3 AP port and SVI interface).
hardware-address	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	The following example configures a static neighbor on SVI 1. `Orion Alpha A28X(config)# ipv6 neighbor 2001::1 vlan 1 00d0.f811.1111`

Related Commands	**Command**	**Description**
	N/A	N/A

Platform Description	N/A

3.25 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	The following example sets the local address of the link as the source IP address to send neighbor requests. `Orion Alpha A28X(config)# no ipv6 ns-linklocal-src`

Related Commands	**Command**	**Description**
	N/A	N/A

Platform	N/A

Description

3.26 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.

```
Orion Alpha A28X(config-if-GigabitEthernet 0/1)# ipv6 redirects
```

Related Commands

Command	Description
show ipv6 interface	Displays the interface information.

Platform Description N/A

3.27 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 The following example forwards the IPv6 packet with route header.

```
Orion Alpha A28X(config)# no ipv6 source-route
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.28 show ipv6 address

Use this command to display the IPv6 addresses.

show ipv6 address [*interface-name*]

Parameter Description

Parameter	Description
interface-name	Interface name

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

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

```
Ruijie#show ipv6 address
Global unicast address limit: 1024, Global unicast address count: 3
Tentative address count: 2,Duplicate address count: 1
Preferred address count: 3,Deprecated address count: 0
Gi 0/5
  FE80::1/64                                  Preferred
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  1000::1/64                                  Duplicate
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
Gi 0/6
  FE80::1/64                                  Tentative
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  1111:1111:1111:1111:1111:1111:1111:1111/64   Tentative
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
Gi 0/7
  FE80::1/64                                  Preferred
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
  2000:1111:1111:1111:1111:1111:1111:1111/64   Preferred
    Preferred lifetime: INFINITE, Valid lifetime: INFINITE
```

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

```
Ruijie#show ipv6 address Gi 0/5
Global unicast address count: 3
Tentative address count: 0,Duplicate address count: 1
Preferred address count: 1,Deprecated address count: 0
FE80::1/64                                  Preferred
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
1000::1/64                                  Duplicate
  Preferred lifetime: INFINITE, Valid lifetime: INFINITE
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

3.29 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.

```
Orion Alpha A28X# 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

3.30 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
interface-id	Interface (including Ethernet interface, aggregate port, or SVI)
ra-info	Displays the RA information of the interface.
brief	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 The following example displays the information of the IPv6 interface.

```
Orion Alpha A28X# 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
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 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.

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

```
Orion Alpha A28X# 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)
```

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.

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

```
Orion Alpha A28X#show ipv6 interface brief

GigabitEthernet 0/1           [down/down]
        2222::2
        FE80::1614:4BFF:FE5C:ED3A
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.31 show ipv6 neighbors

Use this command to display the IPv6 neighbors.

show ipv6 neighbors [**verbose**] [*interface-id*] [*ipv6-address*]

show ipv6 neighbors static

Parameter Description

Parameter	Description
verbose	Displays the neighbor details.
static	Displays the validity status of static neighbors.
interface-id	Displays the neighbors of the specified interface.

ipv6-addres	Displays the neighbors of the specified IPv6 address.

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:Orion
Alpha A28X# 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
Show the neighbor details:
Orion Alpha A28X# 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
```

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) The values of STATE are as below: INCMP (Incomplete): The address resolution of the neighbor is underway, the NS is sent, but the NA is not received. REACH (Reachable): The switch is connected with the neighbor. In this state, the switch takes no additional action when sending packets to the neighbor. 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. 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. 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).

	?: Unknown state. /R—indicate the neighbor is considered as a device /H: The neighbor is a host.
Age	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.
Asked	The number of the NSs that are sent to the neighbor for the resolution of the link address of the neighbor.

Related Commands

Command	Description
ipv6 neighbor	Configures a neighbor.

Platform Description N/A

3.32 show ipv6 neighbors statistics

Use the following command to show the statistics of IPv6 neighbors.

show ipv6 neighbors statistics [**all**]

Parameter Description

Parameter	Description
all	Displays the statistics of all IPv6 neighbors.

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

Configuration Examples The following example displays the statistics of the global neighbors.

```
Orion Alpha A28X#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
Orion Alpha A28X#
```

The following example displays the statistics of all IPv6 neighbors.

```
Orion Alpha A28X#show ipv6 neighbor statistics all

IPv6 neighbor table count: 1
Static neighbor count: 0(0 active, 0 inactive)
Total
Memory: 0 bytes
```

```
Entries: 0
  Static: 0,Dynamic: 0,Local: 0
  Incomplete:0, Reachable:0, Stale:0, Delay:0, Probe:0;

Global
Memory: 0 bytes
Entries: 0
  Static: 0,Dynamic: 0,Local: 0
  Incomplete:0, Reachable:0, Stale:0, Delay:0, Probe:0;
Orion Alpha A28X#
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

3.33 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.
	interface-name	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 inerface.

```
 Orion Alpha A28X#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
Orion Alpha A28X#
```

The following example displays the total statistics of the IPv6 packets.

```
Orion Alpha A28X#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
Orion Alpha A28X#
```

Related Commands

Command	Description
N/A	N/A

Platform Description Supported on all platforms.

3.34 show ipv6 raw-socket

Use this command to display all IPv6 raw sockets.

show ipv6 raw-socket [*num*]

Parameter Description

Parameter	Description
num	Protocol.

Defaults N/A

Command Mode Privileged EXEC mode.

Usage Guide N/A

Configuration Examples The following example displays all IPv6 raw sockets.

```
Orion Alpha A28X# show ipv6 raw-socket
Number Protocol Process name
1      ICMPv6   vrrp.elf
2      ICMPv6   tcpip.elf
3      VRRP     vrrp.elf
```

```
Total: 3
```

Field	Description
Number	Number.
Protocol	Protocol.
Process name	Process number.
Total	Total number of IPv6 raw sockets.

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.35 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
interface-type interface-number	(Optional) Displays the routing advertisement of the specified interface.

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

```
Orion Alpha A28X# 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 seconds, preferred lifetime 604800 seconds
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

3.36 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 The following example displays all IPv6 sockets.

```
Orion Alpha A28X# show ipv6 sockets
Number Process name     Type   Protocol  LocalIP:Port  ForeignIP:Port
State
1      vrrp.elf         RAW    ICMPv6    :::58         :::0           *
2      tcpip.elf        RAW    ICMPv6    :::58         :::0           *
3      vrrp.elf         RAW    VRRP     :::112         :::0           *
4      snmpd            DGRAM  UDP      :::161         :::0           *
5      snmpd            DGRAM  UDP      :::162         :::0           *
6      dhcp6.elf        DGRAM  UDP      :::547         :::0           *
7      sshd             STREAM TCP      :::22          :::0
LISTEN
8      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 N/A

Description

3.37 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 *num*	Local port number.
peer-port *num*	Peer port number.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays all IPv6 UDP sockets.

```
Orion Alpha A28X# show ipv6 udp
Number Local Address   Peer Address   Process name
1      :::161           :::0          snmpd
2      :::162           :::0          snmpd
3       :::547             :::0           dhcp6.elf
```

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
low-ip-address	Start address in the network segment range.
high-ip-address	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 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.

```
Orion Alpha A28X(config)# ip dhcp pool mypool0
Orion Alpha A28X(dhcp-config)# class class1
Orion Alpha A28X (config-dhcp-pool-class)# address range 172.16.1.1
172.16.1.8
```

Related Commands

Command	Description
ip dhcp pool	Defines the name of the DHCP address pool and enters the DHCP 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 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
	file-name	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 The following example defines the device.conf as the startup file name.

```
bootfile device.conf
```

Related Commands	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.

Platform Description N/A

4.3 class

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	Parameter	Description
	class-name	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.

```
Orion Alpha A28X(config)# ip dhcp pool mypool0
Orion Alpha A28X(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

4.4 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.
ip-address	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 The following example clears the DHCP binding with the IP address 192.168.12.100.

```
clear ip dhcp binding 192.168.12.100
```

Related Commands

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

Platform Description N/A

4.5 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.
ip-address	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 The following example clears all address conflict records.

```
clear ip dhcp conflict *
```

Related Commands

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.

Platform Description N/A

4.6 clear ip dhcp history

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

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

Parameter Description

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.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is configured on the DHCP server.

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

Examples

```
Orion Alpha A28X# clear ip dhcp history *
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.7 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 The following example clears the DHCP relay statistics.

```
Orion Alpha A28X# clear ip dhcp relay statistics
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

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

```
Orion Alpha A28X# clear ip dhcp server rate
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

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

```
clear ip dhcp server statistics
```

Related Commands

Command	Description
show ip dhcp server statistics	Displays the statistics record of the DHCP server.

Platform Description N/A

4.10 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** form of this command to restore the default setting.

client-identifier *unique-identifier*

no client-identifier

Parameter Description

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

Defaults N/A.

Command Mode DHCP address pool configuration 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

4.11 client-name

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

```
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

4.12 default-router

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

default-router *ip-address* [*ip-address2…ip-address8*]

no default-router

Parameter Description

Parameter	Description
ip-address	Defines the IP address of the equipment. It is required to configure one IP address at least.
ip-address2…ip-address8	(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

4.13 dns-server

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

dns-server { *ip-address* [*ip-address2…ip-address8*] | **use-dhcp-client** *interface-type interface-number* }

no dns-server

Parameter Description

Parameter	Description
ip-address	Defines the IP address of the DNS server. At least one IP address should be configured.
ip-address2…ip-address8	(Optional) Up to 8 DNS servers can be configured.
use-dhcp-client interface-type interface-number	Uses the DNS server learned by the DHCP client of the Orion Alpha software as the DNS server of the DHCP client.

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 priory, so the DHCP client will select the next DNS server only when its communication with the former DNS server fails. If the Orion Alpha software also acts as the DHCP client, the DNS server information obtained by the client can be transmitted to the DHCP client.

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

```
dns-server 192.168.12.3
```

Related Commands

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.

Platform Description N/A

4.14 domain-name

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

domain-name *domain-name*

no domain-name

Parameter Description

Parameter	Description
domain-name	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 The following example defines the suffix domain name i-net.com.cn for the DHCP client.

```
Orion Alpha A28X(dhcp-config)#domain-name Orion Alpha A28X.com.cn
```

Related Commands

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.

Platform Description N/A

4.15 hardware-address

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

hardware-address *hardware-address* [*type*]

no hardware-address

Parameter Description

Parameter	Description
hardware-address	Define the MAC address of the DHCP client.
type	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 The following example defines the MAC address 00d0.f838.bf3d with the type ethernet.

```
hardware-address 00d0.f838.bf3d
```

Related

Command	Description

Commands		
	client-identifier	Defines the unique ID of the DHCP client (Indicated by the hexadecimal numeral, separated by dot).
	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 enter the DHCP address pool configuration mode.
	default-router	Defines the default route of the DHCP client.

Platform Description N/A

4.16 host

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** form of this command to restore the default setting.

host *ip-address* [*netmask*]

no host

Parameter Description	Parameter	Description
	ip-address	Defines the IP address of DHCP client.
	netmask	Defines the network mask of DHCP client.

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 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
```

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.
default-router	Define the default route of the DHCP client.	**default-router**

Platform Description N/A

4.17 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** form of this command to restore the default setting.

ip address dhcp

no ip address dhcp

Parameter Description

Parameter	Description
N/A	N/A

Defaults The interface cannot obtain the ID address by the DHCP by default.

Command Mode Interface configuration mode.

Usage Guide When requesting the IP address, the DHCP client of the Orion Alpha 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 Orion Alpha 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.

```
Orion Alpha A28X(config)# interface GigabitEthernet 0/1
Orion Alpha A28X(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

4.18 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
class-name	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 "Orion Alpha A28X (config-dhcp-class)#". In this configuration mode, user can configure the Option82 information that matches the CLASS and the CLASS identification information.

Configuration Examples The following example configures a global CLASS.

```
Orion Alpha A28X(config)# ip dhcp class myclass
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.19 ip dhcp excluded-address

Use this command to define some IP addresses and make the DHCP server not assign them to the DHCP client in the global configuration mode. Use the **no** 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*]

Parameter Description

Parameter	Description
low-ip-address	Excludes the IP address, or excludes the start IP address within the range of the IP address.
high-ip-address	Excludes the end IP address within the range of the IP address.

Defaults The DHCP server assigns the IP addresses of the whole address pool by default.

Command Mode Global configuration mode.

Usage Guide If the excluded IP address is not configured, the DHCP server attempts to assign all IP addresses in the DHCP address pool. This command can reserve some IP addresses for specific hosts to prevent these addresses are assigned to the DHCP client, and define the excluded IP address accurately to reduce the conflict detecting time when the DHCP server assigns the address.

Configuration Examples In the following example, the DHCP server will not attempt to assign the IP addresses within 192.168.12.100~150.

```
ip dhcp excluded-address 192.168.12.100 192.168.12.150
```

Related Commands

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

network (DHCP)	Defines the network number and network mask of the DHCP address pool.

Platform Description N/A

4.20 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. The forcible NAK packet sending function is added to shorten the interval at which the client sends DHCPDISCOVER packets.

Configuration Examples The following example enables the forcible NAK packet sending function in global configuration mode.

```
Orion Alpha A28X(config)# ip dhcp force-send-nak
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.21 ip dhcp monitor-vrrp-state

Use this command in layer-3 configuration mode to enable the DHCP Server to monitor the status of VRRP interfaces so that the DHCP Server processes only those packets sent from a VRRP interface in the Master state. Use the **no** form of this command to restore the default setting. If it is canceled, the DHCP Server processes packets from VRRP interfaces in the Master or Backup state.

ip dhcp monitor-vrrp-state

no ip dhcp monitor-vrrp-state

Parameter Description

Parameter	Description
N/A	N/A

Defaults The **ip dhcp monitor-vrrp-state** command is disabled by default. .

Command Mode Layer-3 interface configuration mode.

Usage Guide If a VRRP address is configured for an interface, the DHCP Server processes packets sent from the master interface and discards packets sent from the backup interface. If no VRRP address is configured, the DHCP Server does not monitor the status of VRRP interfaces. All DHCP packets will be processed.

Configuration Examples The following example enables the DHCP Server to monitor the status of VRRP interfaces.

```
Orion Alpha A28X(config-if)# ip dhcp monitor-vrrp-state
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.22 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** form of this command to restore the default setting.

ip dhcp ping packets [*number*]

no ip dhcp ping packets

Parameter Description

Parameter	Description
number	(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 The following example sets the number of the packets sent by the ping operation as 3.

```
ip dhcp ping packets 3
```

Related Commands

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.

Platform Description N/A

4.23 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** form of this command to restore the default setting.

ip dhcp ping timeout *milli-seconds*

no ip dhcp ping timeout

Parameter Description

Parameter	Description
milli-seconds	Time that the DHCP server waits for ping response in the range 100 to 10000 milliseconds.

Defaults The default is 500 seconds.

Command Mode Global configuration mode.

Usage Guide This command defines the time that the DHCP server waits for a ping response packet.

Configuration Examples The following example configures the waiting time of the ping response packet to 600ms.

```
ip dhcp ping timeout 600
```

Related Commands

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.

Platform Description N/A

4.24 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** form of this command to restore the

default setting.

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

Parameter Description

Parameter	Description
pool-name	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:

```
Orion Alpha A28X(dhcp-config)#
```

In this configuration mode, configure the IP address range, the DNS server and the default gateway.

Configuration Examples The following example defines a DHCP address pool named mypool0.

```
ip dhcp pool mypool0
```

Related Commands

Command	Description
host	Defines the IP address and network mask, which is used to configure the DHCP manual binding.
ip dhcp excluded-address	Defines the IP addresses that the DHCP server cannot assign to the clients.
network (DHCP)	Defines the network number and network mask of the DHCP address pool.

Platform Description N/A

4.25 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.

```
Orion Alpha A28X# configure terminal
Orion Alpha A28X(config)# ip dhcp relay check server-id
```

Related Commands

Command	Description
service dhcp	Enables the DHCP Relay.

Platform Description N/A

4.26 ip dhcp relay information circuit-id format

Use this command to set the custom string for circuit-id. Use the **no** form of this command to restore the default setting.

ip dhcp relay information circuit-id format {hex | ascii} [*string*]

no ip dhcp relay information circuit-id format {hex | ascii}

Parameter Description

Parameter	Description
hex	Hexadecimal
ascii	ASCII code.
string	Custom string

Defaults This function is disabled by default.

Command Mode Global configuration mode.

Usage Guide This command is configured on the DHCP Relay. When you configure the **ip dhcp relay information circuit-id format** command, the device, as the DHCP Relay, adds the option information in the DHCP request packets.

Configuration Examples The following example sets the custom string for circuit-id.

```
Orion Alpha A28X(config)# ip dhcp relay information circuit-id format hex
abc111
Orion Alpha A28X(config)# ip dhcp relay information circuit-id
format ascii device-test
```

The following example disables this function.

```
Orion Alpha A28X(config)# no ip dhcp relay information circuit-id format
hex
Orion Alpha A28X(config)# no ip dhcp relay information circuit-
id format ascii
```

Related Commands

Command	Description
N/A	N/A

Platform N/A

Description

4.27 ip dhcp relay information circuit-id string

Description

Use this command to set the device name for circuit-id. Use the **no** form of this command to restore the default setting.

ip dhcp relay information circuit-id string [*devicename*]

no ip dhcp relay information option82

Parameter Description

Parameter	Description
devicename	Sets the device name.

Defaults

This function is diabled by default.

Command Mode

Global configuration mode

Usage Guide

This command is configured on the DHCP Relay. When you configure the **ip dhcp relay information circuit-id string** command, the device, as the DHCP Relay, adds the option information in the DHCP request packets.

Configuration Examples

The following example sets the device name for circuit-id.

```
Orion Alpha A28X(config)# ip dhcp relay information circuit-id string
device-name
```

The following example disables this function.

```
Orion Alpha A28X(config)# no ip dhcp relay information circuit-id string
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

4.28 ip dhcp relay information option82

Description

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 The following example enables the option82 function on the DHCP relay.

```
Orion Alpha A28X# configure terminal
Orion Alpha A28X(config)# Ip dhcp relay information option82
```

Related Commands

Command	Description
service dhcp	Enables the DHCP Relay.

Platform Description N/A

4.29 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.

ip dhcp relay suppression

no ip dhcp relay suppression

Parameter Description

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 The following example enables the relay suppression function on the interface 1.

```
Orion Alpha A28X# configure terminal
Orion Alpha A28X(config)# interface fastEthernet 0/1
Orion Alpha A28X(config-if)# ip dhcp relay suppression
Orion Alpha A28X(config-if)# exit
Orion Alpha A28X(config)#
```

Related Commands

Command	Description
service dhcp	Enables the DHCP Relay.

Platform Description N/A

4.30 ip dhcp relay-information remote-id format

Use this command to set the custom string for remote-id on an interface. Use the **no** form of this command to restore the default setting.

ip dhcp relay-information remote-id format {hex | ascii} [*string*]

no ip dhcp relay-information remote-id format {hex | ascii}

Parameter Description

Parameter	Description
hex	Hexadecimal
ascii	ASCII code
string	Custom string

Defaults This function is disabled by default.

Command Mode Interface configuration mode

Usage Guide This command is configured on the DHCP Relay. When you configure the **ip dhcp relay-information remote-id format** command, the device, as the DHCP Relay, adds the option information in the DHCP request packets.

Configuration Examples The following example sets the custom string for circuit-id.

```
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# ip dhcp relay information remote-id format hex abc111
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# ip dhcp relay information remote-id format ascii port-test
```

The following example disables this function.

```
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# no ip dhcp relay information remote-id format hex
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# no ip dhcp relay information remote-id format ascii
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.31 ip dhcp relay-information remote-id string

Use this command to set the port name for remote-id on an interface. Use the **no** form of this command to restore the default setting.

ip dhcp relay-information remote-id string [*portname*]

no ip dhcp relay-information remote-id string

Parameter Description

Parameter	Description
portname	Sets the port name.

Defaults This function is disabled by default.

Command Mode Interface configuration mode

Usage Guide This command is configured on the DHCP Relay. When you configure the **ip dhcp relay-information remote-id string** command, the device, as the DHCP Relay, adds the option information in the DHCP request packets.

Configuration Examples The following example sets the port name for remote-id on an interface.

```
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# ip dhcp relay-information remote-id string if-port-name
```

The following example disables this function.

```
Orion Alpha A28X(config-if-GigabitEthernet 0/2)# no ip dhcp relay-information remote-id string
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.32 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 The following example enables the user-offline detection.

```
Orion Alpha A28X(config)# ip dhcp server arp-detect
```

Related Commands

Command	Description
N/A	N/A

Platform Description 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 defualt.

Usage Guide N/A

Configuration Examples The following example enables the CLASS to allocate addresses.

```
Orion Alpha A28X(config)# ip dhcp use class
```

Related Commands	**Command**	**Description**
	N/A	N/A

Platform Description 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 | *A.B.C.D* **}**

no ip helper-address { cycle-mode | *A.B.C.D* **}**

Parameter Description	**Parameter**	**Description**
	cycle-mode	Forwards the DHCP request packets to all DHCP servers.
	A.B.C.D	DHCP server IP address

Defaults N/A

Command Mode Global configuration mode, interface configuration mode.

Usage Guide Up to 20 DHCP server IP addresses can be configured globally or on a layer-3 interface.

One DHCP request of this interface will be sent to these servers. You can select one for confirmation.

Configuration Examples The following example sets the IP address for the global server to 192.168.1.1

```
Orion Alpha A28X# configure terminal
Orion Alpha A28X(config)# ip helper-address 192.168.1.1
```

Related Commands

Command	Description
service dhcp	Enables the DHCP relay.

Platform Description N/A

4.35 lease

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** 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

Parameter Description

Parameter	Description
days	Lease time in days
hours	(Optional) Lease time in hours. It is necessary to define the days before defining the hours.
minutes	(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 The following example sets the DHCP lease to 1 hour.

```
lease 0 1
```

The following example sets the DHCP lease to 1 minute.

```
lease 0 0 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

4.36 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*

defaut lease-threshold

no lease-threshold

Parameter Description

Parameter	Description
percentage	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 The following example sets the alarm threshold to 80%.

```
lease-threshold 80
```

The following example restores the default alarm threshold.

```
default lease-threshold
```

The following example disables the address pool alarm function.

```
no lease-threshold
```

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

4.37 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** form of this command can be used to restore the default setting.

netbios-name-server *ip-address* [*ip-address2…ip-address8*]

netbios-name-server

Parameter Description

Parameter	Description
ip-address	IP address of the WINS server. It is required to configure one IP

	address at least.
ip-address2…ip-address8	(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 priory. The DHCP client will select the next WINS server only when its communication with the former WINS server fails.

Configuration Examples The following example specifies the WINS server 192.168.12.3 for the DHCP client.

```
netbios-name-server 192.168.12.3
```

Related Commands

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.

Platform Description N/A

4.38 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** form of this command to restore the default setting.

netbios-node-type *type*

no netbios-node-type

Parameter Description

Parameter	Description
type	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.

```
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.
	netbios-name-server	Configures the WINS name server of the Microsoft DHCP client NETBIOS.

Platform Description N/A

4.39 network (DHCP)

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** form of this command to restore the default setting.
network *net-number net-mask*
no network

Parameter Description

Parameter	Description
net-number	Network number of the DHCP address pool
net-mask	Network mask of the DHCP address pool. If the network mask is not defined, the natural network mask will be used by default.

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 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
```

Related Commands

Command	Description
ip dhcp excluded-address	Defines the IP addresses that the DHCP server 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

4.40 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** form of this command to restore the default setting.
next-server *ip-address* [*ip-address2…ip-address8*]
no next-server

Parameter Description

Parameter	Description
ip-address	Defines the IP address of the startup server, which is usually the TFTP server. It is required to configure one IP address at least.
ip-address2…ip-address8	(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 The following example specifies the startup server 192.168.12.4 for the DHCP client.

```
next-server 192.168.12.4
```

Related Commands

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 Orion Alpha software DHCP server.

Platform Description N/A

4.41 option

Use this command to configure the option of the DHCP server in the DHCP address pool configuration mode. Use the **no** form of this command to restore the default setting.

option *code* { **ascii** *string* | **hex** *string* | **ip** *ip-address* }

no option

Parameter Description

Parameter	Description
code	Defines the DHCP option codes.
ascii *string*	Defines an ASCII string.
hex *string*	Defines a hex string.
ip *ip-address*	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 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.

```
Orion Alpha A28X(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
```

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

4.42 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 The following example disables the address pool.

```
Orion Alpha A28X(dhcp-config)# pool-status disable
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.43 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 “Orion Alpha A28X (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.

```
Orion Alpha A28X(config)# ip dhcp class myclass
Orion Alpha A28X(config-dhcp-class)# relay agent information
```

```
Orion Alpha A28X(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

4.44 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
	aabb.ccdd.eeff…[*]	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 The following example configures a global CLASS which can match multiple Option82 information.

```
Orion Alpha A28X(config)# ip dhcp class myclass
Orion Alpha A28X(config-dhcp-class)# relay agent information
Orion Alpha A28X(config-dhcp-class-relayinfo)# relay-information
 hex 0102256535
Orion Alpha A28X(config-dhcp-class-relayinfo)# relay-information
 hex 010225654565
Orion Alpha A28X(config-dhcp-class-relayinfo)# relay-information
 hex 060225654565
Orion Alpha A28X(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

4.45 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.

```
Orion Alpha A28X(config)# ip dhcp class myclass
Orion Alpha A28X(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

4.46 service dhcp

Use this command to enable the DHCP server and the DHCP relay on the device in global configuration mode. Use the **no** form of this command to restore the default setting.

service dhcp

no service dhcp

Parameter Description

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 The following example enables the DHCP server and the DHCP relay feature.

Examples

```
service dhcp
```

Related Commands

Command	Description
show ip dhcp server statistics	Displays various statistics information of the DHCP server.
ip helper-address [**vrf**] *A.B.C.D*	Adds an IP address of the DHCP server.

Platform Description N/A

4.47 show dhcp exclude

Use this command to display the excluded address.

show dhcp exclude

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 excluded address.

```
Orion Alpha A28X(config)#sh dhcp ex
low                 high
------------------- --------------------
20.1.1.1            20.1.1.2
30.1.1.1            30.1.1.20
Orion Alpha A28X(config)#
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.48 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 Privileged EXEC mode.

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.

```
Orion Alpha A28X# 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

4.49 show dhcp manual-bind

Use this command to display the binding address.

show dhcp manual-bind

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 binding address.

```
Orion Alpha A28X# show dhcp manual-bind
ip         mask          uid/mac          pool_name    gateway      dns
---------  ---------     ----------       -----------  -----------  ------
---------
20.1.1.122  255.0.0.0    0000.0000.0001   static1       1.1.1.1
2.2.2.2
```

ip	IP address
mask	Subnet mask
uid/mac	UID/MAC address

Pool name	Address pool name
gateway	Gateway
dns	DNS server name

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.50 show dhcp name

Use this command to display all DHCP address pool names.

show dhcp name

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 all DHCP address pool names.

```
Orion Alpha A28X(dhcp-config)#sho dhcp name
DYNAMIC POOL
pool name:net20

MANUAL POOL
pool name:static1
pool name:static2

UNKNOWN POOL
pool name:test
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.51 show dhcp pool

Use this command to display the configuration of a specified address pool.

show dhcp pool *name*

Parameter Description	Parameter	Description
	name	Specifies the address pool.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the configuration of a specified address pool.

```
Orion Alpha A28X(dhcp-config)#show dhcp pool net20
network : 20.0.0.0
netmask : 255.0.0.0
lease-infinite : false
lease-days  : 1
lease-hours : 0
lease-minutes : 0
netbios-type : 0
domain-name :
gateway :
dns:
ntp:
option-43:
option-138:
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.52 show dhcp state

Use this command to display whether DHCP server is enabled.

show dhcp state

Parameter Description	Parameter	Description
	N/A	N/A

Defaults N/A

Command Privileged EXEC mode

Mode

Usage Guide N/A

Configuration Examples The following example displays whether DHCP server is enabled.

```
Orion Alpha A28X#show dhcp state
dhcp-server state : true
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.53 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
ip-address	(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 The following is the result of the show ip dhcp binding.

```
Orion Alpha A28X# 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 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

4.54 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.

```
Orion Alpha A28X# 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

4.55 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 Priviledged EXEC mode

Usage Guide This command is configured on the DHCP server.

Configuration Examples The following example displays the DHCP lease history.

```
Orion Alpha A28X#show ip dhcp history
Expired clients           : 3
IP address        Hardware address       Lease expiration
Vlan/Relay
10.1.1.5          2222.abcd.47ac         IDLE                          4097
10.1.1.4          2222.abcd.47ae         IDLE                          4097
10.1.1.3          2222.abcd.47ad         IDLE                          4097
Running clients           : 0
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.56 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 The following example displays the DHCP address pool ID and address usage.

```
Orion Alpha A28X# 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.

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

4.57 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
poolname	(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 The following example displays the output result of the **show ip dhcp pool** *poolname* command.

```
Orion Alpha A28X# show ip dhcp poolname
Pool poolname:
 Address range     192.168.0.1 - 192.168.0.254
 Class range      192.168.0.1 - 192.168.0.254
 Total address     252
Excluded      2
Distributed     30
Conflict      10
Remained      212
Usage percentage    84.12698%
Lease threshold    90%
```

The meaning of various fields in the show result is described as follows.

Field	Description
Address range	Address range of the address pool.

Class range	Class address range. By default, the address range for the same address pool is not configured. Otherwise, the class range is displayed.
Total address	Total number of addresses that can be assigned in the address pool.
Excluded	Number of excluded addresses.
Distributed	Number of assigned addresses.
Conflict	Number of conflicting addresses in the address pool.
Remained	Number of remaining addresses that have not been assigned or can be reused.
Usage percentage	Address pool usage.
Lease threshold	Lease threshold.

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

4.58 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.

```
Orion Alpha A28X# 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
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

4.59 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 The following example displays the output result of the **show ip dhcp server statistics** command.

```
Orion Alpha A28X# 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
DHCPREQUEST               25
DHCPDECLINE                0
DHCPRELEASE                1
```

```
DHCPINFORM              150

Message                   Sent
BOOTREPLY                16
DHCPOFFER                9
DHCPACK                   7
DHCPNAK                   0
DHCPREQTIMES             0
DHCPREQSUCTIMES          0
DISCOVER-PROCESS-ERROR 0
LEASE-IN-PINGSTATE        0
NO-LEASE-RESOURCE        0
SERVERID-NO-MATCH         0
-----------------------------------------
recv                           0
send                          0
```

The meaning of various fields in the show result is described as follows.

Field	Description
Address pools	Number of address pools.
Lease count	Number of allocated lease.
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.

Related Commands

Command	Description
clear ip dhcp server statistics	Clears the DHCP server statistics.

Platform Description N/A

4.60 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.

```
Orion Alpha A28X#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 client

Use this command to reset the DHCPv6 client.

clear ipv6 dhcp client *interface-type interface-number*

Parameter Description

Parameter	Description
interface-type interface-number	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 The following example resets DHCP client VLAN 1.

```
Orion Alpha A28X# clear ipv6 dhcp client vlan 1
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

5.2 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 The following example clears the packet sending and receiving condition with the DHCPv6 Relay function enabled.

```
Orion Alpha A28X# clear ipv6 dhcp relay statistics
```

Related Commands

Command	Description
show ipv6 dhcp relay statistics	Displays the statistical information.

Platform Description N/A

5.3 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

Parameter	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-commitkey** 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 The following example enables the request for the IANA address on the interface.

Examples

```
Orion Alpha A28X(config)# interface fastethernet 0/1
Orion Alpha A28X(config-if)# ipv6 dhcp client ia
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

5.4 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
prefix-name	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 The following example enables the prefix information request on the interface.

```
Orion Alpha A28X(config)# interface fastethernet 0/1
Orion Alpha A28X(config-if)# ipv6 dhcp client pd pd_name
```

Related Commands

Command	Description
clear ipv6 dhcp client	Resets the DHCPv6 client function on the interface.
show ipv6 dhcp interface	Displays the DHCPv6 interface configuration.

Platform Description N/A

5.5 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
ipv6-address	Sets the DHCPv6 relay destination address.
interface-type interface-number	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 sets the relay destination address on the interface.

```
Orion Alpha A28X(config)# interface fastethernet 0/1
Orion Alpha A28X(config-if)# ipv6 dhcp relay destination 2008:1::1
```

Related Commands

Command	Description
show ipv6 dhcp interface	Displays the DHCPv6 interface information.

Platform Description N/A

5.6 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 The following example displays the device DUID.

```
Orion Alpha A28X# show ipv6 dhcp
This device's DHCPv6 unique identifier(DUID):
00:03:00:01:00:d0:f8:22:33:b0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

5.7 show ipv6 dhcp interface

Use this command to display the DHCPv6 interface information.

show ipv6 dhcp interface [*interface-name*]

Parameter Description

Parameter	Description
interface-name	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 isdisplayed. If the *interface-name* is specified, the specified interface information is displayed.

Configuration Examples The following example displays the DHCPv6 interface information.

```
Orion Alpha A28X# 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

5.8 show ipv6 dhcp relay destination

Use this command to display the destination information about DHCPv6 Relay Agent.

show ipv6 dhcp relay destination

Parameter description

Parameter	Description
all	Displays information about all configured destination addresses and relay exits.

Interface *interface-type interface-number*	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.

Examples The following example displays all the relay destination addresses.

```
Orion Alpha A28X# show ipv6 dhcp relay destination all
Interface: Vlan1   //interface for which the relay function has been
enabled
Destination address(es)                          Output Interface
3001::2
FF02::1:2      //specified destination address             Vlan2
//specified relay exit
```

Related commands

Command	Description
N/A	N/A

Platform description N/A

5.9 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.

```
Orion Alpha A28X# show ipv6 dhcp relay statistics
Packets dropped               :  2
    Error                     :  2
    Excess of rate limit      :  0
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               :  14
Packets sent                  :  16
    ADVERTISE                 :  0
    RECONFIGURE               :  0
    REPLY                     :  8
    RELAY-FORWARD             :  8
 RELAY-REPLY               :  0
```

Related Commands

Command	Description
clear ipv6 dhcp relay statistics	Clears the statistical information.

Platform Description 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
host-name	Deletes the specified dynamic domain name buffer.
*	Deletes all dynamic domain name buffer.

Defaults N/A

Command Privileged EXEC mode.

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 The following configuration deletes the dynamically learned mapping records from the host name-IP address buffer table.

```
Orion Alpha A28X(config)#clear host *
```

Related Commands

Command	Description
show hosts	Displays the host name buffer table.

Platform Description 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.

ip domain-lookup

no 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 This command enables the domain name resolution function.

Configuration Examples The following example disables the DNS domain name resolution function.

```
Orion Alpha A28X(config)# no ip domain-lookup
```

Related Commands

Command	Description
show hosts	Displays the DNS related configuration information.

Platform Description 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
host-name	The host name of the equipment
ip-address	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.

```
Orion Alpha A28X(config)# ip host www.test.com 192.168.5.243
```

Related Commands

Command	Description
show hosts	Show the DNS related configuration information.

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 { *ip-address* | *ipv6-address }*

no ip name-server [*ip-address* | *ipv6-address*]

Parameter Description

Parameter	Description
ip-address	The IP address of the domain name server.
ipv6-address	The IPv6 address of the domain name server.

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 N/A

Related Commands

Command	Description
show hosts	Displays the DNS related configuration information.

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
host-name	The host name of the equipment
ipv6-address	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 The following example configures the IPv6 address for the domain name.

```
Orion Alpha A28X(config)# ipv6 host switch 2001:0DB8:700:20:1::12
```

Related Commands

Command	Description
show hosts	Displays the DNS related configuration information.

Platform Description 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 Privileged EXEC mode.

Usage Guide This command is used to display the DNS related configuration information.

Configuration Examples

```
Orion Alpha A28X# show hosts
Name servers are:
192.168.5.134 static

Host                type          Address               TTL(sec)
switch              static       192.168.5.243           ---
www.Orion Alpha A28X.com   dynamic      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
ip host	Configures the host name and IP address mapping by manual.
ipv6 host	Configures the host name and IPv6 address mapping by manual.
ip name-server	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.

Configuration Examples The following example enables the FTP Server and confines the FTP client access to the syslog subdirectory:

```
Orion Alpha A28X(config)# ftp-server topdir /syslog
Orion Alpha A28X(config)# ftp-server enable
```

The following example disables the FTP Server:

```
Orion Alpha A28X(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
time	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 The following example sets the timeout interval for login to the FTP server to 5 minutes.

```
Orion Alpha A28X(config)# ftp-server login timeout 5
```

The following example restores the default setting.

```
Orion Alpha A28X(config)# no ftp-server login timeout
```

Related Commands

Command	Description
N/A	N/A

Platform Description 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
time	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 The following example sets the number of login attempts to 5.

Examples

```
Orion Alpha A28X(config)# ftp-server login times 5
```

The following example restores the default setting.

```
Orion Alpha A28X(config)# no ftp-server login times
```

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

7.4 ftp-server timeout

Use this command to set the FTP session idle timeout. Use the **no** form of this command to restore the default setting.

ftp-server timeout time

no ftp-server timeout

Parameter Description

Parameter	Description
time	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 deems the session connection is invalid and disconnects with the user.


The session idle time refers to the time for the FTP session between two FTP operations

Configuration Examples

The following example sets the session idle timeout to 5 minutes:

```
Orion Alpha A28X(config)# ftp-server timeout 5
```

The following example restores the default setting.

```
Orion Alpha A28X(config)# no ftp-server timeout
```

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** form of this command to restore the default setting.

ftp-server topdir *directory*

no ftp-server topdir

Parameter Description

Parameter	Description
directory	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.

```
Orion Alpha A28X(config)# ftp-server topdir /syslog
Orion Alpha A28X(config)# ftp-server enable
```

The following example restores the default setting.

```
Orion Alpha A28X(config)# no ftp-server topdir
```

Related Commands

Command	Description
N/A	N/A

Platform Description 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

username	Sets the login username.
password	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. One username 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:

```
Orion Alpha A28X(config)# ftp-server username user password pass
```

The following example restores the default setting:

```
Orion Alpha A28X(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:

```
Orion Alpha A28X#show ftp-server

ftp-server information

==================================

enable : Y

topdir : tmp:/

timeout: 10min

username:aaaa         password:(PLAINT)bbbb         connect num[2]

[0]trans-type:BINARY (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:(PLAINT)bbbb         connect num[0]

username:a2           password:(PLAINT)bbbb         connect num[0]

username:a3           password:(PLAINT)bbbb         connect num[0]

username:a4           password:(PLAINT)bbbb         connect num[0]

username:a5           password:(PLAINT)bbbb         connect num[0]

username:a6           password:(PLAINT)bbbb         connect num[0]

username:a7           password:(PLAINT)bbbb         connect num[0]

username:a8           password:(PLAINT)bbbb         connect num[0]

username:a9           password:(PLAINT)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
username	The username for logging into FTP Server. It is limited to 40 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
password	The password for logging into FTP Server. It is limited to 32 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
dest-address	IP address of the target FTP Server.
remote-directory	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.
remote-file	Filename on the remote server. It is limited to 255 bytes and doesn't support space or Chinese character.
local-directory	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.
local-file	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".

```
Orion Alpha A28X# 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
username	The username for logging into FTP Server. It is limited to 40 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
password	The password for logging into FTP Server. It is limited to 32 bytes and must not contain ":", "@", "/" and space, neither can it be omitted.
dest-address	IP address of the target FTP Server.
remote-directory	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.
remote-file	Filename on the remote server. It is limited to 255 bytes and doesn't support space or Chinese character.
local-directory	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.
local-file	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 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".

```
Orion Alpha A28X# copy ftp://user:pass@192.168.23.69/root/remote-file
```

```
flash:home/local-file
```

Related Commands

Command	Description
copy tftp	Uses the TFTP protocol to transfer files.

Platform Description N/A

8.3 ftp-client ascii

Use this command to use ASCII mode for FTP transfer.

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

ftp-client ascii

no ftp-client ascii

default ftp-client

Parameter Description

Parameter	Description
N/A	N/A

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 Examples The following example configures ASCII FTP transfer.

```
Orion Alpha A28X (config)# ftp-client ascii
```

The following example configures binary FTP transfer.

```
Orion Alpha A28X(config)# no ftp-client ascii
```

The following example restores the default setting of the FTP Client.

```
Orion Alpha A28X(config)# default ftp-client
```

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** form of this

command to restore the default setting.

ftp-client port

no ftp-client port

default ftp-client

Parameter Description

Parameter	Description
N/A	N/A

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

```
Orion Alpha A28X (config)# ftp-client port
```

The following example configures PASV mode for FTP data connection.

```
Orion Alpha A28X(config)# no ftp-client port
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

8.5 ftp-client source-address

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 source-address {*ip-address* **|** *ipv6-address*}

no ftp-client source-address

default ftp-client

Parameter Description

Parameter	Description
N/A	N/A

Defaults By default, the IP address is not bound with the client locally. Instead, it is selected by the route.

Command Global configuration mode

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 Examples The following example binds FTP Client with source IP address 192.168.23.236.

```
Orion Alpha A28X(config)# ftp-client source-address 192.168.23.236
```

The following example binds FTP Client with source IP address 2003:0:0:0::2.

```
Orion Alpha A28X(config)# ftp-client source-address 2003:0:0:0::2
```

The following example disables source IP address binding.

```
Orion Alpha A28X(config)# no ftp-client source-address
```

The following example restores the default setting of the FTP Client.

```
Orion Alpha A28X(config)# default ftp-client
```

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**.

```
Orion Alpha A28X(config)# tftp-server topdir /syslog
Orion Alpha A28X(config)# tftp-server enable
```

The following example disables the TFTP server.

```
Orion Alpha A28X(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
directory	The top directory for TFTP clients to access. "/" means the root directory.

Defaults No top directory is configured by default (no read-write permission).

Command Global configuration mode

Modes

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 servicer and sets the top directory for TFTP clients to **/syslog**.

```
Orion Alpha A28X(config)# tftp-server topdir /syslog
Orion Alpha A28X(config)# tftp-server enable
```

The following example removes the top directory.

```
Orion Alpha A28X(config)# no tftp-server topdir
```

Platform Description N/A

10 Network Connectivity Test Tool Commands

10.1 clear rping table all

Use this command to clear Rping entries.

clear rping table [**all |** [**ping-object** *owner test-name*] | [**trace-object** *owner test-name*]]

Parameter Description

Parameter	Description
owner	User index
test-name	Test index

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example clears all Rping entries.

```
Orion Alpha A28X# clear rping table all
```

The following example clears the specified Rping entry.

```
Orion Alpha A28X# clear rping table user Orion Alpha A28X
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

10.2 ping

Use this command to test the connectivity of a network to locate the network connectivity problem. The command format is as follows:

ping [**ip**] [*address* [**length** *length*] [**ntimes** *times*] [**timeout** *seconds*] [**data** *data*] [**source** *source*] [**df-bit**] [**validate**] [**detail**]] [**interval** *millisecond*] [**out-interface** *interface* [**next-hop** *next-hop*]]]

Parameter Description

Parameter	Description
address	Specifies an IPv4 address.
length	Specifies the length of the packet to be sent (range: 36-18024, default: 100).
times	Specifies the number of packets to be sent (range:1-

	4294967295).
seconds	Specifies the timeout time (range: 1-10 seconds).
data	Specifies the data to fill in.
source	Specifies the source IPv4 address or the source interface. The loopback interface address (for example: 127.0.0.1) is not allowed to be the source address.
df-bit	Sets the DF bit for the IP address. DF bit=1 indicates not to segment the datagrams. By default, the DF bit is 0.
validate	Sets whether to validate the reply packets or not.
detail	Sets whether to contain details in the echoed message. By default, only "!" and "." are displayed.
interface	Specifies the outbound interface
next-hop	Specifies the next hop IPv4 address
millisecond	Specifies the ping interval, in the range from 10 to 300000 milliseconds. Default: 100 milliseconds.

Defaults Five packets with 100Byte in length are sent to the specified IP address within specified time (2s by default).

Command Mode Privileged EXEC mode.

Usage Guide If the device can be pinged, the response information is displayed, and the statistics is listed at the end. For the extension functions of ping, the number, quantity and timeout time of the packets to be sent can be specified, and the statistics is also displayed in the end. To use the domain name function, configure the domain name server firstly. For the concrete configuration, refer to the DNS Configuration section.

Configuration Examples The following example tests the connectivity of a network to locate the network connectivity problem.

(Products do not support the VRF parameter. The following example is for reference purpose. Please take the actual device as the standard.)

```
(regular ping).Orion Alpha A28X# ping 192.168.21.26
Sending 5, 100-byte ICMP Echoes to 192.168.21.26, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/10 ms
```

The following example displays details.

```
Orion Alpha A28X#ping 192.168.21.26 detail
*Apr 16 09:16:08: %PING-7-DEBUG: Ping vrf index -1.
Sending 5, 100-byte ICMP Echoes to 192.168.21.26, timeout is 2 seconds:
  < press Ctrl+C to break >
Reply from 192.168.21.26: bytes=100 time=4ms TTL=64
Reply from 192.168.21.26: bytes=100 time=3ms TTL=64
Reply from 192.168.21.26: bytes=100 time=1ms TTL=64
Reply from 192.168.21.26: bytes=100 time=1ms TTL=64
```

```
Reply from 192.168.21.26: bytes=100 time=1ms TTL=64
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms.2
```

The following example tests the connectivity of a network to locate the network connectivity problem (extension ping).

```
Orion Alpha A28X# ping 192.168.21.26 length 1500 ntimes 100 data ffff source
192.168.21.99 timeout 3
Sending 100, 1500-byte ICMP Echoes to 192.168.21.26, timeout is 3 seconds:
  < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 2/2/3 ms
```

The following example displays the details.

```
ping 192.168.21.26 length 1500 ntimes 20 data ffff source 192.168.21.99
timeout 3 detail
Sending 20, 1500-byte ICMP Echoes to 192.168.21.26, timeout is 3 seconds:
  < press Ctrl+C to break >
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=2ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=3ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64
Reply from 192.168.21.26: bytes=1500 time=1ms TTL=64

Success rate is 100 percent (20/20), round-trip min/avg/max =
1/1/3 ms
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

10.3 ping ipv6

Use this command to test the connectivity of a network to locate the network connectivity problem. The command format is as follows:
ping [**ipv6**] [*ip-address* [**length** *length*] [**ntimes** *times*] [**timeout** *seconds*] [**data** *data*] [**source** *source*] [**detail**] [**interval** *millisecond*] [**out-interface** interface [**next-hop** *next-hop*]]]

Parameter Description

Parameter	Description
ip-address	Specifies an IPv6 address.
length	Specifies the length of the packet to be sent (range: 36-18024, default: 100).
times	Specifies the number of packets to be sent (range:1-4294967295).
seconds	Specifies the timeout time (range: 1-10 seconds).
data	Specifies the data to fill in.
source	Specifies the source IPv6 address or the source interface. The loopback interface address (for example: 127.0.0.1) is not allowed to be the source address.
detail	Sets whether to contain details in the echoed message. By default, only “!” and “.” are displayed.
interface	Specifies the outbound interface
next-hop	Specifies the next hop IPv6 address
millisecond	Specifies the ping interval, in the range from 10 to 300000 milliseconds. Default: 100 milliseconds.

Defaults Five packets with 100Byte in length are sent to the specified IP address within specified time 2 seconds by default

Command Mode Privileged EXEC mode.

Usage Guide If the device can be pinged, the response information is displayed, and the statistics is listed at the end. If the response data does not match the request data, a ‘Request receive error.’ message is displayed and the statistics is listed in the end. For the extension functions of ping ipv6, the number, quantity and timeout time of the packets to be sent can be specified, and the statistics is also displayed in the end. To use the domain name function, configure the domain name server firstly. For the concrete configuration, refer to the DNS Configuration section.

Configuration Examples The following example tests the connectivity of a network to locate the network connectivity problem.

```
Orion Alpha A28X# ping ipv6 2000::1
Sending 5, 100-byte ICMP Echoes to 2000::1, timeout is 2 seconds:
  < press Ctrl+C to break >
```

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/10 ms
```

The example below shows the extension ping ipv6.

```
Orion Alpha A28X# ping  ipv6 2000::1  length 1500 ntimes 100 timeout 3 data
ffff source 192.168.4.10:
Sending 100, 1500-byte ICMP Echoes to 2000::1, timeout is 3 seconds
  < press Ctrl+C to break >
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 2/2/3 ms
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

10.4 show rping detail

Use this command to display Rping information.

show rping detail

Parameter Description

Parameter	Description
N/A	N/A

Defaults N/A

Command Mode Privileged EXEC mode/Global configuration mode/Interface configuration mode

Usage Guide This command is used to display the Rping information such as numbers of test accounts and users.

Configuration Examples The following example displays Rping information.

```
Orion Alpha A28X#show rping detail
Total owner number: 2
Total test number: 4
owner: user1
   test name: taget_1         storage type: volatile
test name: taget_2         storage type: nonVolatile
owner: user2
   test name: taget_1         storage type: permanent
test name: taget_2         storage type: readOnly
```

Field	Description

Total owner number	The number of users
Total test number	The number of Rping accounts
owner	Username
test name	Test name
storage type	Storage type

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

10.5 traceroute

Use this command to display all gateways passed by the test packets from the source address to the destination address.

traceroute [**ip**] [*address* [**probe** *number*] [**source** *source*] [**timeout** *seconds*] [**ttl** *minimum maximum*]] [**out-interface** *interface* [**next-hop** *next-hop*]]]

Parameter Description

Parameter	Description
address	Specifies an IPv4 address.
number	Specifies the number of probe packets to be sent (range: 1-255).
source	Specifies the source IPv4 address or the source interface. The loopback interface address (for example: 127.0.0.1) is not allowed to be the source address.
seconds	Specifies the timeout time (range: 1-10 seconds).
minimum maximum	Specifies the minimum and maximum TTL values (range:1-255).
interface	Specifies the outbound interface
next-hop	Specifies the next hop IPv4 address

Defaults By default, *seconds* is 3 seconds, *number* is 3, *minimum* and *maximum* are 1 and 255.

Command Mode Privileged EXEC mode: enables extended functions.
User EXEC mode: enables basic functions.

Usage Guide Use the **traceroute** command to test the connectivity of a network to exactly locate the network connectivity problem when the network failure occurs. To use the function domain name, configure the domain name server. For the concrete configuration, refer to the DNS Configuration part.

Configuration Examples The following is three examples of the application bout traceroute, the one is of the smooth network, and the other is the network in which some gateways aren't connected successfully.

1. When the network is connected smoothly:

```
Orion Alpha A28X# traceroute 61.154.22.36
  < press Ctrl+C to break >
```

```
Tracing the route to 61.154.22.36

1      192.168.12.1     0 msec   0 msec   0 msec
2      192.168.9.2      4 msec   4 msec   4 msec
3      192.168.9.1      8 msec   8 msec   4 msec
4       192.168.0.10    4 msec   28 msec  12 msec
5       192.168.9.2     4 msec   4 msec   4 msec
6       202.101.143.154     12 msec  8 msec   24 msec
7       61.154.22.36    12 msec  8 msec   22 msec
```

From above result, it's clear to know that the gateways passed by the packets sent to the host with an IP address of 61.154.22.36 (gateways 1~6) and the spent time are displayed. Such information is helpful for network analysis.

2. When some gateways in the network fail:

```
Orion Alpha A28X# traceroute 202.108.37.42
  < press Ctrl+C to break >
Tracing the route to 202.108.37.42

1      192.168.12.1     0 msec    0 msec  0 msec
2      192.168.9.2      0 msec    4 msec  4 msec
3      192.168.110.1    16 msec  12 msec  16 msec
4      *  *  *
5      61.154.8.129     12 msec   28 msec  12 msec
6      61.154.8.17      8 msec    12 msec  16 msec
7      61.154.8.250     12 msec   12 msec  12 msec
8      218.85.157.222       12 msec   12 msec  12 msec
9       218.85.157.130  16 msec   16 msec  16 msec
10      218.85.157.77       16 msec   48 msec  16 msec
11      202.97.40.65    76 msec   24 msec  24 msec
12      202.97.37.65    32 msec   24 msec  24 msec
13      202.97.38.162       52 msec   52 msec  224 msec
14      202.96.12.38    84 msec   52 msec  52 msec
15      202.106.192.226     88 msec   52 msec  52 msec
16      202.106.192.174     52 msec   52 msec  88 msec
17      210.74.176.158      100 msec  52 msec  84 msec
18      202.108.37.42       48 msec   48 msec  52 msec
```

The above result clearly shown that the gateways passed by the packets sent to the host with an IP address of 202.108.37.42 (gateways 1~17) and the spent time are displayed, and gateway 4 fails.

3. When this function is enabled based on a domain name:

```
Orion Alpha A28X# traceroute www.ietf.org
Translating "www.ietf.org"...[OK]
  < press Ctrl+C to break >
Tracing the route to 64.170.98.32

 1      192.168.217.1       0 msec  0 msec  0 msec
```

```
2      10.10.25.1          0 msec  0 msec  0 msec
3      10.10.24.1          0 msec  0 msec  0 msec
4      10.10.30.1          10 msec 0 msec  0 msec
5      218.5.3.254         0 msec  0 msec  0 msec
6      61.154.8.49         10 msec 0 msec  0 msec
7      202.109.204.210     0 msec  0 msec  0 msec
8      202.97.41.69    20 msec 10 msec 20 msec
9      202.97.34.65        40 msec 40 msec 50 msec
10     202.97.57.222       50 msec 40 msec 40 msec
11     219.141.130.122     40 msec 50 msec 40 msec
12     219.142.11.10       40 msec 50 msec 30 msec
13     211.157.37.14       50 msec 40 msec 50 msec
14     222.35.65.1         40 msec 50 msec 40 msec
15     222.35.65.18        40 msec 40 msec 40 msec
16     222.35.15.109       50 msec 50 msec 50 msec
17     *       *       *
18     64.170.98.32    40 msec 40 msec 40 msec
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

10.6 traceroute ipv6

Use this command to display all gateways passed by the test packets from the source address to the destination address.

traceroute [**ipv6**] [*address* [**probe** *number*] [**timeout** *seconds*] [**ttl** *minimum maximum*] [**out-interface** *interface* [**next-hop** *next-hop*]]]

Parameter Description

Parameter	Description
address	Specifies an IPv6 address.
number	Specifies the number of probe packets to be sent.
seconds	Specifies the timeout time.
minimum maximum	Specifies the minimum and maximum TTL values.
interface	Specifies the outbound interface
next-hop	Specifies the next hop IPv6 address

Defaults By default, *seconds* is 3 seconds, *number* is 3, *minimum* and *maximum* are 1 and 255.

Command Mode Privileged EXEC mode: enables extended functions.
User EXEC mode: enables basic functions.

Usage Guide Use the **traceroute ipv6** command to test the connectivity of a network to exactly locate the network

connectivity problem when the network failure occurs. To use the function domain name, configure the domain name server. For the concrete configuration, refer to the DNS Configuration part.

Configuration Examples

The following is two examples of the application bout traceroute ipv6, the one is of the smooth network, and the other is the network in which some gateways aren't connected successfully.

1. When the network is connected smoothly:

```
Orion Alpha A28X# traceroute ipv6 3004::1
  < press Ctrl+C to break >
Tracing the route to 3004::1
1      3000::1         0 msec  0 msec  0 msec
2      3001::1         4 msec  4 msec 4 msec
3      3002::1         8 msec  8 msec  4 msec
4      3004::1         4 msec  28 msec  12 msec
```

From above result, it's clear to know that the gateways passed by the packets sent to the host with an IP address of 3004::1 (gateways 1~4) and the spent time are displayed. Such information is helpful for network analysis.

2. When some gateways in the network fail:

```
Orion Alpha A28X# traceroute ipv6 3004::1
 < press Ctrl+C to break >
Tracing the route to 3004::1
1      3000::1         0 msec  0 msec  0 msec
2      3001::1         4 msec  4 msec 4 msec
3      3002::1         8 msec  8 msec  4 msec
4      * * *
5      3004::1         4 msec  28 msec  12 msec
```

The above result clearly shown that the gateways passed by the packets sent to the host with an IP address of 3004::1 (gateways 1~5) and the spent time are displayed, and gateway 4 fails.

Related Commands

Command	Description
N/A	N/A

Platform Description

N/A

11 TCP Commands

11.1 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*]

no ip tcp keepalive

Parameter Description

Parameter	Description
interval *num1*	The interval of sending the keepalive packet, in the range from1 to 120 in the unit of seconds, The default is 75.
times *num2*	Keepalive packet sending times, in the range from 1 to 10. The default is 6.
idle-period *num3*	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 The following example enables the TCP keepalive function on the device and sets the **idle-period** and **interval** to180 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.

```
Orion Alpha A28X(config)# ip tcp keepalive interval 60 times 4 idle-period
180
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.2 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
max-segment-size	Upper limit of the MSS value in the range from 68 to 10000 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 The following example sets the upper limit of the MSS value to 1300 bytes.

```
Orion Alpha A28X(config)# ip tcp mss 1300
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.3 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
age-timer *minutes*	The time interval for further discovery after discovering PMTU. Its value ranges from 10 to 30 minutes. The default value is 10.
age-timer infinite	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 untill the PMTU value reaches the MSS or the user stops this timer. Use the parameter **age-timer infinite** to stop this timer.

Configuration Examples The following example enables PMTU discovery.

```
Orion Alpha A28X(config)# ip tcp path-mtu-discovery
```

Related Commands

Command	Description
show tcp pmtu	Shows the PMTU value for the TCP connection.

Platform Description N/A

11.4 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 The following example disables the device from sending the reset packet when receiving the TCP port unreachable packet.

```
Orion Alpha A28X(config)# no ip tcp send-reset
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.5 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
seconds	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.

```
Orion Alpha A28X(config)# ip tcp syntime-out 10
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.6 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
size	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.
The sending buffer is used to buffer the data of application programs. Each byte in the sending buffer has a sequence number, and bytes with sequence numbers acknowledged will be removed from the sending buffer. Increasing the sending buffer will improve the interaction between TCP and application programs, thus enhancing the performance. However, increasing the receiving buffer and sending buffer will result in more memory consumption of TCP.
This command is used to change the size of receiving buffer and sending buffer for TCP connections.
This command changes both the receiving buffer and sending buffer, and only applies to subsequent connections. This command applies to both IPv4 and IPv6 TCP.

Configuration Examples The following example sets the TCP window size to 16386 bytes.

```
Orion Alpha A28X(config)# ip tcp window-size 16386
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.7 service tcp-keepalives-in

Use this command to enable the keepalive function for the TCP server. Use the no form of this command to restore the default setting.
service tcp-keepalives-in [*interval*] [**garbage**]
no service tcp-keepalives-in

Parameter Description

Parameter	Description
interval	The interval of sending keepalive packets, in the range from 1 to 65535 in the unit of seconds. The default is 60.
garbage	The keepalive packet contains one-byte invalid data. The invalid data is not contained by default.

Defaults This function is disabled by default.

Command Mode Global configuration mode

Usage Guide The keepalive function enables the TCP server to detect whether the client is operating properly. If the TCP server sends the keepalive packet for four consecutive times without receiving any TCP packet from the client, the TCP connection is considered invalid and then is disconnected automatically.

Configuration Examples The following example enables the keepalive function for the TCP server and sets the interval of sending the keepalive packet to 10 seconds. The keepalive packet contains one-byte invalid data.

```
Orion Alpha A28X(config)# service tcp-keepalives-in 10 garbage
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.8 service tcp-keepalives-out

Use this command to enable the keepalive function for the TCP client. Use the **no** form of this command to restore the default setting,
service tcp-keepalives-out [*interval*] [**garbage**]
no service tcp-keepalives-out [*interval*] [**garbage**]

Parameter Description

Parameter	Description
interval	The interval of sending keepalive packets, in the range from 1 to 65535 in the unit of seconds. The default is 60.
garbage	The keepalive packet contains one-byte invalid data. The invalid data is not contained by default.

Defaults This function is disabled by default.

Command Mode Global configuration mode

Usage Guide The keepalive function enables the TCP client to detect whether the server is operating properly. If the TCP client sends the keepalive packet for four consecutive times without receiving any TCP packet from the server, the TCP connection is considered invalid and then is disconnected automatically.

Configuration Examples The following example enables the keepalive function for the TCP client and sets the interval of sending the keepalive packet to 10 seconds. The keepalive packet contains one-byte invalid data

```
Orion Alpha A28X(config)# service tcp-keepalives-out 10 garbage
```

Related Commands	Command	Description
	N/A	N/A

Platform Description N/A

11.9 show ipv6 tcp connect

Use this command to display the current IPv6 TCP connection information.

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	Parameter	Description
	local-ipv6 *X:X:X:X::X*	Local IPv6 address
	local-port *num*	Local port
	peer-ipv6 *X:X:X:X::X*	Peer IPv6 address
	peer-port *num*	Peer port
	statistics	Displays IPv6 TCP connection statistics

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the current IPv6 TCP connection information.

```
Orion Alpha A28X#show ipv6 tcp connect
Number Local Address     Foreign Address          State        Process
name
1      :::22             :::0                     LISTEN       sshd
2      :::23             :::0                     LISTEN       telnetd
3      1000::1:23        1000::2:64201            ESTABLISHED  telnetd
The following example displays the current IPv6 TCP connection statistics.
Orion Alpha A28X#show ipv6 tcp connect statistics
State         Count
-----       -----
ESTABLISHED 1
SYN_SENT     0
SYN_RECV     0
FIN_WAIT1    0
FIN_WAIT2    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

11.10 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

Parameter	Description
local-ipv6 *X:X:X:X::X*	Local IPv6 address
local-port *num*	Local port
peer-ipv6 *X:X:X:X::X*	Peer IPv6 address
peer-port *num*	Peer port

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example information about IPv6 TCP PMTU.

```
Orion Alpha A28X# show ipv6 tcp pmtu
Number  Local Address           Foreign Address        PMTU
1        1000::1:23                  1000::2.13560
```

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

11.11 show ipv6 tcp port

Use this command to display the current IPv6 TCP port status.

show ipv6 tcp port [*num*]

Parameter Description

Parameter	Description
num	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.

```
Orion Alpha A28X#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	Current status of the TCP connection. There are eleven possible states: CLOSED: The connection has been closed. LISTEN: Listening state SYNSENT: In the three-way handshake phase when the SYN packet has been sent out. SYNRCVD: In the three-way handshake phase when the SYN packet has been received. ESTABLISHED: The connection has been established. FINWAIT1: The local end has sent the FIN packet. FINWAIT2: The FIN packet sent by the local end has been acknowledged. CLOSEWAIT: The local end has received the FIN packet from the peer end. LASTACK: The local end has received the FIN packet from the peer end, and then sent its own FIN packet. 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. TIMEWAIT: The FIN packet sent by the local end has been acknowledged, and the local end has also acknowledged the FIN packet.

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.12 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 *a.b.c.d*	Local IP address.
local-port *num*	Local port.
peer-ip *a.b.c.d*	Peer IP address.
peer-port *num*	Peer port.
statistics	Displays IPv4 TCP connection statistics.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the current IPv4 TCP connection information.

```
Orion Alpha A28X#show tcp connect
Number Local Address     Foreign Address          State       Process name
1      0.0.0.0:22        0.0.0.0:0                LISTEN      sshd
2      0.0.0.0:23        0.0.0.0:0                LISTEN      telnetd
3      1.1.1.1:23        1.1.1.2:64201            ESTABLISHED 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	Current status of the TCP connection. There are eleven possible states: CLOSED: The connection has been closed. LISTEN: Listening state SYNSENT: In the three-way handshake phase when the SYN packet has been sent out. SYNRCVD: In the three-way handshake phase when the SYN packet has been received. ESTABLISHED: The connection has been established. FINWAIT1: The local end has sent the FIN packet. FINWAIT2: The FIN packet sent by the local end has been acknowledged. CLOSEWAIT: The local end has received the FIN packet from the peer end. LASTACK: The local end has received the FIN packet from the peer end, and then sent its own FIN packet. 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. 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.

The following example displays the current IPv4 TCP connection statistics.

```
Orion Alpha A28X#show tcp connect statistics
State         Count
```

```
-----       -----
ESTABLISHED 1
SYN_SENT     0
SYN_RECV     0
FIN_WAIT1    0
FIN_WAIT2    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

11.13 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 The following example shows TCP parameters.

```
Orion Alpha A28X#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 probing: 0
FIN specific information:
  FIN_WAIT_2 timeout: 60 seconds
Orphan socket information:
  Max orphans: 16384
  Max orphan retries: 0
Current orphans: 0
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.14 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
local-ip *a.b.c.d*	Local IP address.
local-port *num*	Local port.
peer-ip *a.b.c.d*	Peer IP address.
peer-port *num*	Peer port.

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays PMTU of IPv4 TCP connection.

```
Orion Alpha A28X# show tcp pmtu
Number  Local Address           Foreign Address         PMTU
1       192.168.195.212.23      192.168.195.112.13560  1440
```

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
ip tcp path-mtu-discovery	Enables the TCP PMTU discovery function.

Platform Description N/A

11.15 show tcp port

Use this command to display information about the current TCP port.

show tcp port [*num*]

Parameter Description

Parameter	Description
num	Port number

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays the current IPv4 TCP port status.

```
Orion Alpha A28X#sh tcp port
tcp port status:
```

```
Tcpv4 listen on 2650 have connections:
TCB        Foreign Address                          Port     State
Tcpv4 listen on 2650 have total 0 connections.
Tcpv4 listen on 23 have connections:
TCB        Foreign Address                          Port     State
c340800    1.1.1.2                                  64571    ESTABLISHED
Tcpv4 listen on 23 have total 1 connections.
Tcpv6 listen on 23 have connections:
TCB        Foreign Address                          Port     State
c429980    3000::2                                  64572    ESTABLISHED
```

Tcpv6 listen on 23 have total 1 connections.

Field	Description
TCB	The control block's location in the current memory
Foreign Address	Remote address
Port	Remote port number
State	Status of the current TCP connection. There are eleven possible states: CLOSED: The connection has been closed. LISTEN: Listening state SYNSENT: In the three-way handshake phase when the SYN packet has been sent. SYNRCVD: In the three-way handshake phase when the SYN packet has been received. ESTABLISHED: The connection has been established. FINWAIT1: The local end has sent the FIN packet. FINWAIT2: The FIN packet sent by the local end has been acknowledged. CLOSEWAIT: The local end has received the FIN packet from the peer end. LASTACK: The local end has received the FIN packet from the peer end, and then sent its own FIN packet. 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. TIMEWAIT: The FIN packet sent by the local end has been acknowledged, and the local end has also acknowledged the FIN packet.

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

11.16 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.

```
Orion Alpha A28X#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
```

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

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

12 IPv4/IPv6 REF Commands

12.1 clear ip ref packet statistics

Use this command to clear IPv4 Orion Alpha A28X 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 The following example clears IPv4 REF packet statistics.

```
Orion Alpha A28X #clear ip ref packet statistics
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

12.2 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 The following example clears IPv6 REF packet statistics.

```
Orion Alpha A28X #clear ipv6 ref packet statistics
```

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

12.3 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
glean	Aggregate adjacent node, which is used for a direct route
local	Local adjacent node, which is used by the local host
ip	Next-hop IP address
interface_type	Interface type
interface_number	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 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.

```
Orion Alpha A28X#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
6  unresolved  glean  1    0   0.0.0.0         GigabitEthernet 0/0
4  unresolved  local  3    0   0.0.0.0         Local 1
```

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	Layer 2 head

Related Commands

Command	Description
show ip ref route	Displays all route information in the current REF module.

Platform Description N/A

12.4 show ip ref exact-route

This command is used to display the IPv4 REF exact route.

show ip ref exact-route *source_ipaddress dest_ipaddress*

Parameter Description

Parameter	Description
source_ipaddress	Source IP address of the packet
dest_ipaddress	Destination IP address of the packet

Defaults 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.

```
Orion Alpha A28X# show ip ref exact-route 192.168.217.74 192.168.13.1
192.168.217.74  --> 192.168.13.1:
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

12.5 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 The following example displays IPv4 REF packet statistics.

```
Orion Alpha A28X #show ip ref pkt-statistic
ref packet statistic:
```

```
   bad head        : 0
   lookup fib fail : 0
   local adj       : 0
   glean adj       : 0
   forward         : 0
   redirect        : 0
   punt adj        : 0
   outif not in ef : 0
   ttl expiration  : 0
   no ip routing   : 0
```

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

12.6 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 Mode Privileged EXEC mode

Usage Guide N/A

Configuration Examples The following example displays IPv4 REF resolution information.

```
Orion Alpha A28X#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

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

12.7 show ip ref route

Use this command to display all the routing information in the IPv4 REF table.

show ip ref route [**default** | *ip mask* | **statistics**]

Parameter Description

Parameter	Description
default	Specifies the default route.
ip	Specifies the destination IP address of the route
mask	Specifies the mask of the route.
statistics	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.

```
Orion Alpha A28X#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
 224.0.0.0        240.0.0.0         1  1   224.0.0.0
```

```
224.0.0.0      255.255.255.0    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
```

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

12.8 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
ipv6-address	Next-hop IP address
interface_type	Interface type
interface_number	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 The following example displays the information about the IPv6 adjacent node..

```
Orion Alpha A28X#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   ::1   Local 1
```

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	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.

Related Commands

Command	Description
N/A	N/A

Platform Description N/A

12.9 show ipv6 ref exact-route

This command is used to display the IPv6 REF exact route.

show ipv6 ref exact-route *source-ipv6-address destination-ipv6-address*

Parameter Description

Parameter	Description
source-ipv6-address	Source IP address of the packet
destination-ipv6-address	Destination IP address of the packet

Defaults N/A

Command Privileged EXEC mode

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.

```
Orion Alpha A28X#show ipv6 exact-route 2001:db8:1::1 3001:db8:2::2
2001:db8:1::1 --> 3001:db8:2::2:
ID  state       type    rfct chg ip 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
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
N/A	N/A

Platform Description N/A

12.10 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.

```
Orion Alpha A28X#show ipv6 ref packet statistics
ref packet statistic:
    bad head        : 0
    lookup fib fail : 0
    local adj       : 0
    glean adj       : 0
    forward         : 0
    redirect        : 0
    hop-limit expiration  : 0
   no ipv6 unicast-routing   : 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

12.11 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 Examples The following example displays IPv6 REF resolution information.

```
Orion Alpha A28X#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

12.12 show ipv6 ref route

Use this command to display all the routing information in the IPv6 REF table.

show ipv6 ref route [default | statistics | prefix/len]

Parameter Description

Parameter	Description
default	Specifies the default route.
statistics	Statistics
prefix/len	Displays the route with the specified prefix (X:X:X:X::X/<0-128>).

Defaults N/A

Command Mode Privileged EXEC mode

Usage Guide This command is used to display all routing information in the IPv6 REF table.

Configuration Examples The following example displays all the routing information in the REF IPv6 table.

```
Orion Alpha A28X#show ipv6 ref route
Codes: * - default route
 prefix/len                      weight path_id  next_hop interface
 2001:da8:ffe:2::/64             1        3       ::      GigabitEthernet
0/0
 2001:da8:ffe:2::3/128           1        2       ::1     Local 1
 fe80::/10                       1        6        ::     Null 0
 fe80::21a:a9ff:fe3b:fa41/128    1        2        ::1    Local 1
```

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