DES-7200

IP Application Command Reference Guide

Version 10.4(3)

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Date:

Copyright Statement

Preface

Version Description

This manual matches the firmware version 10.4(3).

Target Readers

This manual is intended for the following readers:

📖 Network engineers

📖 Technical salespersons

📖 Network administrators

Conventions in this Document

1. Universal Format Convention

Arial: Arial with the point size 10 is used for the body.

Note: A line is added respectively above and below the prompts such as caution and note to separate them from the body.

Format of information displayed on the terminal: Courier New, point size 8, indicating the screen output. User's entries among the information shall be indicated with bolded characters.

2. Command Line Format Convention

Arial is used as the font for the command line. The meanings of specific formats are described below:

Bold: Key words in the command line, which shall be entered exactly as they are displayed, shall be indicated with bolded characters.

Italic: Parameters in the command line, which must be replaced with actual values, shall be indicated with italic characters.

[ ]: The part enclosed with [ ] means optional in the command.

{ x | y | ... }: It means one shall be selected among two or more options.

[x | y | ...]: It means one or none shall be selected among two or more options.

//:Lines starting with an exclamation mark "//" are annotated.

3. Signs

Various striking identifiers are adopted in this manual to indicate the matters that special attention should be paid in the operation, as detailed below:

 **Caution**	Warning, danger or alert in the operation.

 **Note**	Descript, prompt, tip or any other necessary supplement or explanation for the operation.

 **Note**	The port types mentioned in the examples of this manual may not be consistent with the actual ones. In real network environments, you need configure port types according to the support on various products. The display information of some examples in this manual may include the information on other series products, like model and description. The details are subject to the used equipments.

1 IP Address Configuration Commands

1.1 Interface Address Configuration Commands

1.1.1 ip-address

Use this command to configure the IP address of an interface. The **no** form of this command can be used to delete the IP address of the interface.

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

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

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.
secondary	Indicates the secondary IP address that has been configured.
gateway *ip-address*	Configure the gateway address for the layer-2 switch, which is only supported on the layer-2 switches. No address is followed by the gateway when using the no form of this command.

Default No IP address is configured for the interface.

Usage guidelines Interface configuration mode.

Usage The equipment cannot receive and send IP packets before

guidelines

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 DES-7200 supports multiple IP address for an interface, in which one is the primary IP address and others are the secondary IP addresses. Theoretically, there is no limit for the number of secondary IP addresses. The primary IP address must be configured before the secondary IP addresses. The secondary IP address and the primary IP address must belong to the same network or different networks. Secondary IP addresses are often used in network construction. Typically, you can try to use secondary IP addresses in the following situations:

- A network hasn’t enough host addresses. At present, the LAN should be a class C network where 254 hosts can be configured. However, when there are more than 254 hosts in the LAN, another class C network address is necessary since one class C network is not enough. Therefore, the device should be connected to two networks and multiple IP addresses should be configured.
- Many older networks are layer 2-based bridge networks that have not been divided into different subnets. Use of secondary IP addresses will make it very easy to upgrade this network to an IP layer-based routing network. The equipment configures an IP address for each subnet.
- Two subnets of a network are separated by another network. You can create a subnet for the separated network, and connect the separated subnet by configuring a secondary IP address. One subnet

	cannot appear on two or more interfaces of a device.

Examples

In the example below, the primary IP address is configured as 10.10.10.1, and the network mask is configured as 255.255.255.0.

```
ip address 10.10.10.1 255.255.255.0
```

In the example below, the default gateway is configured as 10.10.10.254

```
ip address 10.10.10.1 255.255.255.0 gateway 10.10.10.254
```

Related commands

Command	Description
show interface	Show detailed information of the interface.

Platform description

For the Layer 2 switch, the IP address can be configured only for the Layer 3 interface. The Level-2 address is not supported, that is, the secondary option is unavailable.

The keyword **gateway** is only supported by the layer-2 switches.

1.1.2 ip unnumbered

Use this command to configure an unnumbered interface. After an interface is configured as unnumbered interface, it is allowed to run the IP protocol and can receive and send IP packets. The **no** form can be used to remove this configuration.

ip unnumbered *interface-type interface-number*

no ip unnumbered

Parameter description

Parameter	Description
interface-type	Interface type
interface-number	Interface number

Default N/A.

Command mode Interface configuration mode.

Usage guidelines

Unnumbered interface is an interface that has IP enabled on it but no IP address is assigned to it. The unnumbered interface should be associated to an interface with an IP address. The source IP address of the IP packet generated by an unnumbered interface is the IP address of the associated interface. In addition, the routing protocol process determines whether to send route update packets to an unnumbered interface according to the IP address of the associated interface. The following restrictions apply when an unnumbered interface is used:

- An Ethernet interface cannot be configured as an unnumbered interface.
- A serial interface can be configured as an unnumbered interface when it is encapsulated with SLIP, HDLC, PPP, LAPB and Frame-relay. However, when Frame-relay is used for encapsulation, only the point-to-point interface can be configured as an unnumbered interface. X.25 encapsulation does not allow configuration as an unnumbered interface.
- You cannot detect whether an unnumbered interface works normally using the **ping** command, because no IP address is configured for the unnumbered interface. However, the status of the unnumbered interface can be monitored remotely using SNMP.
- The network cannot be started using an unnumbered interface.

Examples

In the example below the local interface is configured as an unnumbered interface, and the associated interface is FastEthernet 0/1. An IP address must be configured for the associated interface.

```
ip unnumbered fastEthernet 0/1
```

Related commands

Command	Description
show interface	Show detailed information of the interface.

Platform description

This command is not supported on the Layer 2 switch.

1.2 Address Resolution Protocol (ARP) Configuration Commands

1.2.1 arp

Use this command to add a permanent IP address and MAC address mapping to the ARP cache table. The **no** form of this command deletes the static MAC address mapping.

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.
alias	(Optional) DES-7200 will respond to the ARP request from this IP address after this parameter is defined.

Default

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

Command mode

Global configuration mode.

Usage guidelines

DES-7200 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.

Examples

The following is an example of setting an ARP static mapping record for a host in the Ethernet.

```
arp 1.1.1.1 4e54.3800.0002 arpa
```

Related

Command	Description

	clear arp-cache	Clear the ARP cache table

1.2.2 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 learnning). Sending large number of this messages 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 messges 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 possilble 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. The **no** form of this command restores it to default value 3.

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 of 0 to 100. 0 stands for disabling the arp anti-ip-attack function.

Default configuration	By default, set the discarded entry after 3 unknown unicast messages are sent to the CPU.
Command mode	Global configuration mode.

Usage guidelines	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.

Examples	The following configuration sets the IP message number that triggers to set the discarding entry as 5.
	`DES-7200(config)# arp anti-ip-attack 5`
	The following configuration disables the ARP anti-ip-attack function.
	`DES-7200(config)# arp anti-ip-attack 0`

Platform description	This command is supported on the Layer 3 switch.

1.2.3 arp gratuitous-send interval

Use this command to set the interval of sending the free ARP request message on the interface..The **no** form of this command disables this function on the interface.

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 1 to 3600 seconds

Default configuration	This function is not enabled on the interface to send the free ARP request regularly.
Command mode	Interface configuration mode.

Usage guidelines	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.

Examples	The following configuration sets to send one free ARP request to SVI 1 per second.
	`DES-7200(config)# interface vlan 1`
	`DES-7200(config-if)# arp gratuitous-send interval 1`
	The following configuration stops sending the free ARP request to SVI 1.
	`DES-7200(config)# interface vlan 1`
	`DES-7200(config-if)# no arp gratuitous-send`

1.2.4 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. The **no** form of this command is used to restore the default value, that is, retry an ARP request per second.

arp retry interval *seconds*

no arp retry interval

Parameter description

Parameter	Description
seconds	Time for retrying the ARP request message in the range of 1 to 3600 seconds, 1 second by default.

Default configuration	The retry interval of the ARP request is 1s.
Command mode	Global configuration mode.
Usage guidelines	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.

Examples

The following configuration sets the retry interval of the ARP request as 30s.

```
arp retry interval 30
```

Related commands

Command	Function
arp retry times *number*	Set the retry time of the ARP request message.

1.2.5 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. The **no** form of this command can be used to restore the default 5 times of the ARP retry requests.

arp retry times *number*

no arp retry times

Parameter description

Parameter	Description
number	The times of sending the same ARP request in the range 1 to100..When it is set as 1, it indicates that the ARP request is not retransmitted, only 1 ARP request message is sent.

Default configuration

If the ARP response message is not received, the ARP request message will be sent for 5 times, and then it will be timed out.

Command mode

Global configuration mode.

Usage guidelines

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.

Examples

The following configuration will set the local ARP request not to be retried.

```
arp retry times 1
```

The following configuration will set the local ARP request to be retried for one time.

```
arp retry times 2
```

Related commands

Command	Function
arp retry interval *seconds*	Set the retry interval of the ARP request message.

1.2.6 arp timeout

Use this command to configure the timeout for the ARP static mapping record in the ARP cache. The no form of this command restores it to the default configuration.

arp timeout *seconds*

no arp timeout

Parameter description

Parameter	Description
seconds	The timeout ranging 0 to 2147483 seconds

Default The default timeout is 3600 seconds.

Command mode Interface configuration mode.

Usage guidelines

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.

Examples

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

```
interface fastEthernet 0/1
arp timeout 120
```

Related commands

Command	Description
clear arp-cache	Clear the ARP cache list.
show interface	Show the interface information.

1.2.7 arp trusted

Use this command to set the maximun number of trusted ARP entries.The **no** form of this command restores it to the default value.

arp trusted *number*

no arp trusted

Parameter description

Parameter	Description
number	Maximum number of trusted ARP entries in the range of 10 to 4096.

Default configuration

The default value is different for different products.

Command mode

Global configuration mode.

Usage guidelines

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.

Examples

The following configuration sets 1000 trusted ARPs.

```
arp trusted 1000
```

Related commands

Command	Function
service trustedarp	Enable the trusted ARP function.

Platform description	N/A

1.2.8 arp unresolve

Use this command to configure the maximum number of the unresolved ARP entries. The **no** form of this command can restore it to the default value 8192.

arp unresolve *number*

no arp unresolve

Parameter description

Parameter	Description
number	The maximum number of the unresolved ARP entries in the range of 1 to 8192. The default value is 8192.

Default configuration	The ARP cache table can contain up to 8192 unresolved entries.
Command mode	Global configuration mode.
Usage guidelines	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.
Examples	The following configuration sets the maximum number of the unresolved items as 500. `arp unresolve 500`

1.2.9 ip proxy-arp

Use this command to enable ARP proxy funtion on the interface. The **no** form of this command disables ARP function.

ip proxy-arp

no ip proxy-arp

Default	Disabled on the version higher than 10.2(3).

Command mode	Interface configuration mode.
Usage guidelines	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.

Examples	The following is an example of enabling ARP on FastEthernet port 0/1:
	`interface fastEthernet 0/1`
	`ip proxy-arp`

Platform description	This command is not supported on the Layer 2 switch.

1.2.10 service trustedarp

Use this command to enable the trusted ARP function.The **no** form of this command disables the trusted ARP function.

service trustedarp

no service trustedarp

Default configuration	Disabled.
Command mode	Global configuration mode.
Usage guidelines	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. In the following three cases, the STP protocol clears not only the dynamic MAC address of a port but also the

trusted entries, including trusted MAC and trusted ARP:

1 STP is enabled.

2 The port is set to neither root port nor designed port. This may be caused when the port is up or down or the port priority is modified.

3 TC packet is received on the port, and the addresses of the ports not receiving PC packet are cleared.

Examples

The following configuration is to enable the trusted ARP function in the global configuration mode.

```
config
service trustedarp
```

Platform description

N/A

1.2.11 trusted-arp user-vlan

Use this command to execute the VLAN transformation while setting the trusted ARP entries.The **no** form of this command deletes an ARP entry.

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

no trusted-arp user-vlan *vid1*

Parameter description

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

Default configuration

No VLAN transformation is executed.

Command mode

Global configuration mode.

Usage guidelines

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.

Examples	The following configuration is to set the VLAN sent by the server to 3, but the VLAN which takes effect in the trusted ARP entry to 5. `trusted-arp user-vlan 3 translated-vlan 5`

Related commands

Command	Function
service trustedarp	Enable the trusted ARP function.

Platform description	N/A

1.3 Broadcast Message Processing Configuration Commands

1.3.1 ip broadcast-addresss

Use this command to define a broadcast address for an interface in the interface configuration mode. The **no** form of this command is used to remove the broadcast address configuration.

ip broadcast-addresss *ip-address*

no ip broadcast-addresss

Parameter description

Parameter	Description
ip-address	Broadcast address of IP network

Default	The default IP broadcast address is 255.255.255.255.
Command mode	Interface configuration mode.
Usage guidelines	At present, the destination address of IP broadcast packet is all “1”, represented as 255.255.255.255. The DES-7200 can generate broadcast packets with other IP addresses through definition, and can receive both all “1” and the broadcast packets defined by itself.
Examples	The following is an example of setting the destination

	address of IP broadcast packets generated by this interface to 0.0.0.0. `ip broadcast-address 0.0.0.0`
Platform description	This command is not supported on the Layer 2 switch.

1.3.2 ip directed-broadcast

Use this command to enable the conversion from IP directed broadcast to physical broadcast in the interface configuration mode. The **no** form of this command is used to remove the configuration.

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

no ip directed-broadcast

Parameter description

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

Default	Disabled.
Command mode	Interface configuration mode.

Usage guidelines	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 **no ip directed-broadcast** is configured on an interface, DES-7200 will discard the directed broadcast packets received from the directly connected network.

Examples	The following is an example of enabling forwarding of directed broadcast packet on the fastEthernet 0/1 port of a device.
	`interface fastEthernet 0/1`
	`ip directed-broadcast`

Platform description	This command is not supported on the Layer 2 switch.

1.4 IP Address Monitoring and Maintenance Commands

1.4.1 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 in the privileged mode.

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

Command mode	Privileged mode.
Usage guidelines	This command can be used to refresh an ARP cache table.

Caution

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.

Examples

The following is an example of removing all dynamic ARP mapping records.

```
clear arp-cache
```

The following is an example of removing dynamic ARP table entry 1.1.1.1

```
clear arp-cache 1.1.1.1
```

The following is an example of removing dynamic ARP table entry on interface SVI1

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

Related commands

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

Platform description	N/A

1.4.2 clear ip route

Use this command to remove the entire IP routing table or a particular routing record in the IP routing table in the privileged user mode.

clear ip route { ***** **|** *network* [*netmask*] }

Parameter description

Parameter	Description
*	Remove all the routes.
network	The network or subnet address to be removed
netmask	(Optional) Network mask

Command mode

Privileged mode.

Usage guidelines

Once an invalid route is found in the routing table, you can immediately refresh the routing table to get the updated routes. Note that, however, refreshing the entire routing table will result in temporary communication failure in the entire network.

Examples

The example below refreshes only the route of 192.168.12.0.

```
clear ip route 192.168.12.0
```

Related commands

Command	Description
show ip route	Show the IP routing table.

Platform description

This command is not supported on the Layer 2 switch.

1.4.3 show arp

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

show arp [[**vrf** *vrf-name*] [**trusted**] *ip* [*mask*] | **static** | **complete** | **incomplete** | *mac-address*]

Parameter description

Parameter	Description
ip	Show the ARP entry of the specified IP address.

vrf *vrf-name*	VRF instance, which shows the ARP entry with specified VRF.
ip mask	Show the ARP entries of the network segment included within the mask.
mac-address	Show the ARP entry of the specified MAC address.
static	Show all the static ARP entries.
complete	Show all the resolved dynamic ARP entries.
incomplete	Show all the unresolved dynamic ARP entries.
mac-address	Show the ARP entry with the specified mac address.

Command mode

Any

Examples

The following is the output result of the **show arp** command:

```
DES-7200# 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 is the output result of **show arp** *192.168.195.68*

```
DES-7200# 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 is the output result of **show arp** *192.168.195.0 255.255.255.0*

```
DES-7200# 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 is the output result of **show arp** *001a.a0b5.378d*

```
DES-7200# show arp 001a.a0b5.378d
Protocol  Address  Age(min)  Hardware  Type   Interface
Internet  192.168.195.67   4   001a.a0b5.378d  arpa   VLAN 1
```

Platform description	N/A

1.4.4 show arp counter

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

show arp counter

Parameter description	N/A.
Command mode	Any.

Examples	The following is the output result of the **show arp counter** command:
	`DES-7200# show arp counter`
	`The Arp Entry counter:0`
	`The Unresolve Arp Entry:0`
	The meaning of each field in the ARP cache table is described in Table 1.

1.4.5 show arp detail

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

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

Parameter description

Parameter	Description
Interface-type interface-number	Show the ARP of the layer 2 port or the layer 3 interface.
ip	Show the ARP entry of the specified IP address.
ip mask	Show the ARP entries of the network segment included within the mask.
mac-address	Show the ARP entry of the specified MAC address.
static	Show all the static ARP entries.
complete	Show all the resolved dynamic ARP entries.
incomplete	Show all the unresolved dynamic ARP entries.

Command mode	Privileged mode
Usage guidelines	Use this command to show the ARP details, such as the ARP type (Dynamic, Static, Local, Trust), the information on the layer2 port.
Examples	The following is the output result of the **show arp detail** command:

```
DES-7200# 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 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

Platform description	N/A

1.4.6 show arp timeout

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

show arp timeout

Parameter description	N/A.
Command mode	Any.

Examples	The following is the output of the **show arp timeout** command:
	`DES-7200# show arp timeout`
	`Interface arp timeout(sec)`
	`---------- ----------`
	`VLAN 1 3600`
	The meaning of each field in the ARP cache table is described in Table 1.

Platform description	This command is not supported on the Layer 2 switch.

1.4.7 show ip arp

Use this command to show the Address Resolution Protocol (ARP) cache table in the privileged user mode.

show ip arp

Parameter description	N/A.
Command mode	Privileged mode.

Examples

The following is the output of **show ip arp**:

```
DES-7200# 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

Interface	Interface associated with the IP address.

Platform description	This command is not supported on the Layer 2 switch.

1.4.8 show ip interface

Use this command to show the IP status information of an interface. The command format is as follows:

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

Parameter description

Parameter	Description
interface-type	Specify interface type.
interface-number	Specify interface number.
brief	Show the brief configurations about the IP of the layer-3 interface (including the interface primary ip, secondary ip and interface status)

Command mode	Privileged mode.

Usage guidelines

When an interface is available, DES-7200 will create a direct route in the routing table. The interface is available in that the DES-7200 can receive and send packets through this interface. If the interface changes from available status to unavailable status, the DES-7200 removes the appropriate direct route from the routing table.

If the interface is unavailable, i.e. 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.

Examples

Presented below is the output of **show ip interface brirf**:

```
DES-7200# show ip interface brief
Interface                  IP-Address(Pri)   IP-Address(Sec)
Status
GigabitEthernet 0/10  2.2.2.2/24    3.3.3.3/24        DOWN
```

```
GigabitEthernet 0/11  no address     no address        DOWN
VLAN 1                1.1.1.1/24     no address        DOWN
```

Presented below is the output of **show ip interface vlan**

```
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-boardcast 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: 0 Request packet:0 Reply packet: 0 Unknown packet: 0	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: 0 Echo request:0 Echo reply: 0 Unreachable:0 Source quench:0 Routing redirect:0	Show the total number of ICMP packets received on the interface, including: ■ Echo request packet ■ Echo reply packet ■ Unreachable packet ■ Source quench packet ■ Routing redirection packet

Outgoing access list is	Show whether an outgoing access list has been configured for an interface.
Inbound access list is	Show whether an incoming access list has been configured for an interface.

1.4.9 show ip packet statistics

Use this command to show the statistics of IP packets.

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

Parameter description

Parameter	Description
interface-name	Interface name
total	Show the total statistics of all interfaces.

Command mode

Privileged mode.

Usage guidelines

N/A

Examples

N/A

Related commands

Command	Description
-	-

2 IP Service Configuration Commands

2.1 IP Service Configuration Commands

2.1.1 ip mask-reply

Use this command to configure the DES-7200 to respond the ICMP mask request and send an ICMP response message in the interface configuration mode. The **no** form of this command is used to prohibit from sending the ICMP mask response message.

ip mask-reply

no ip mask-reply

Default configuration	By default, no ICMP mask response message is sent.
Command mode	Interface configuration mode.
Usage guidelines	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.

Examples	The following is an example of setting the FastEthernet 0/1 interface of a device to respond the ICMP mask request message.
	`interface fastEthernet 0/1`
	`ip mask-reply`

Platform description	This command is supported on the Layer 2 switch only.

2.1.2 ip mtu

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

ip mtu *bytes*

no ip mtu

Parameter description

Parameter	Description
bytes	Maximum transmission unit of IP packet ranging 68 to 1500 bytes

Default configuration

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

Command mode

Interface configuration mode.

Usage guidelines

If an IP packet is larger than the IP MTU, the DES-7200 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.

Examples

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

```
interface fastEthernet 0/1
ip mtu 512
```

Related commands

Command	Description
mtu	Set the MTU value of an interface.

Platform description	This command is supported on the Layer 2 switch only.

2.1.3 ip redirects

Use this command to allow the DES-7200 to send an ICMP redirection message in the interface configuration mode. The **no** form of this command is used to disable the ICMP redirection function.

ip redirects

no ip redirects

Default configuration	Enabled.
Command mode	Interface configuration mode.
Usage guidelines	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. The DES-7200 enables ICMP redirection by default.

Examples	The following is an example of disabling ICMP redirection for the fastEthernet 0/1 interface.
	`interface fastEthernet 0/1`
	`no ip redirects`

Platform description	This command is supported on the Layer 2 switch only.

2.1.4 ip source-route

Use this command to allow the DES-7200 to process an IP packet with source route information in the global configuration mode. The **no** form of this command is used to disable the source route information processing function.

ip source-route

no ip source-route

Default configuration	Enabled.
Command mode	Global configuration mode.
Usage guidelines	DES-7200 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. The DES-7200 supports IP source route by default.
Examples	The following is an example of disabling the IP source route. `no ip source-route`
Platform description	This command is supported on the Layer 2 switch only.

2.1.5 ip unreachables

Use this command to allow the DES-7200 to generate ICMP destination unreachable messages. The **no** form of this command disables this function.

ip unreachables

no ip unreachables

Default configuration	Enabled.

Command mode	Interface configuration mode.
Usage guidelines	DES-7200 will send an ICMP destination unreachable message if it receives unicast message with self-destination-address and can not process the upeer protocol of this message. DES-7200 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.
Examples	The following example disables sending ICMP destination unreachable message on FastEthernet 0/1. **interface fastEthernet** *0/1* **no ip unreachables**
Platform description	This command is not supported on the Layer 2 switch.

3 IPv6 Configuration Commands

3.1 Configuration Related Commands

3.1.1 ipv6 address

Use this command to configure an IPv6 address for a network interface. Use the **no** form of this command to delete the configured address.

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	*ipv6-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 DES-7200 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.

Command mode

Interface configuration mode

Usage guidelines

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**.

	 **Caution** For the DES-7200 series, The length of the IPv6 address prefix is not limited, but there are 512 IPv6 routings of which prefix length supported by the switch is in the range of 65 to 127.

Examples	DES-7200(config-if)# **ipv6 address** *2001:1::1/64* DES-7200(config-if)# **no ipv6 address** *2001:1::1/64* DES-7200(config-if)# **ipv6 address** *2002:1::1/64 eui-64* DES-7200(config-if)# **no ipv6 address** *2002:1::1/64 eui-64*

3.1.2 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 delete the auto-configured address.

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.

Command mode	Interface configuration mode

Usage guidelines	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.

Examples	`DES-7200(config-if)# ipv6 address autoconfig default` `DES-7200(config-if)# no ipv6 address autoconfig`

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

3.1.3 ipv6 enable

Use this command to enable the IPv6 function on an interface. Use the **no** form of this command to disable this function.

ipv6 enable

no ipv6 enable

Default configuration	Disabled.
Command mode	Interface configuration mode.
Usage guidelines	The IPv6 function of an interface can be enabled by configuring **ipv6 enable** or by configuring IPv6 address for the interface.

Caution

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**.

Examples	`DES-7200(config-if)# ipv6 enable`

Related commands	**Command**	**Description**
	show ipv6 interface	Show the related information of an interface.

3.1.4 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.

Command mode

Global configuration mode.

Usage guidelines

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 is usually used for the Ipv6 address configuration on the interface.

Examples

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

```
DES-7200(config)# ipv6 general-prefix my-prefix
2001:1111:2222::/48
```

Related commands

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

3.1.5 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

Default configuration	The default is 64.
Command mode	Global configuration mode.
Usage guidelines	This command takes effect for the unicast messages only, not for multicast messages.
Examples	DES-7200(config)# **ipv6 hop-limit** *100*

3.1.6 ipv6 neighbor

Use this command to configure a static neighbor. Use the **no** form of this command to remove the setting.

ipv6 neighbor *ipv6-address interface-id hardware-address*

no ipv6 neighbor ipv6-address interface-id

Parameter description

Parameter	Description
ipv6-address	IPv6 address of the neighbor. It must follow the address format defined in RFC4291.
interface-id	Network interface of the neighbor (including routed Port, L3 AP interface, or SVI interface).
hardware-address	Hardware address of the neighbor. It shall be a 48-bit MAC address in the format of XXXX.XXXX.XXXX, where “X” is a hexadecimal number.

Default configuration	No static neighbor is configured.

Command mode	Global configuration mode.
Usage guidelines	Similar to the ARP command, the static neighbor can only be configured on an IPv6 protocol enabled interface. If the neighbor to be configured has been learned through NDP and has been stored in the neighbor list, the dynamically generated neighbor will be automatically switched to a static one. The configured static neighbor is always in the **Reachable** status. Use **clear ipv6 neighbors** to clear all the neighbors dynamically learned through NDP. Use **show ipv6 neighbors** to view the neighbor information.
Examples	`DES-7200(config)# ipv6 neighbor 2001::1 vlan 1 00d0.f811.1111`

Related commands

Command	Description
show ipv6 neighbors	Show the neighbor information.
clear ipv6 neighbors	Clear the neighbors learned dynamically.

3.1.7 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

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.

Default configuration	1.

Command mode	Interface configuration mode.
Usage guidelines	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.
Examples	`DES-7200(config-if)# ipv6 nd dad attempts 3`

Related commands

Command	Description
show ipv6 interface	Show the interface information.

3.1.8 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 remove the setting.

ipv6 nd managed-config-flag

no ipv6 nd managed-config-flag

Default configuration	None.
Command mode	Interface configuration mode.
Usage guidelines	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.

Examples

```
DES-7200(config-if)# ipv6 nd managed-config-flag
```

Related commands

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

3.1.9 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
-	-

Default configuration

The flag bit is not set by default.

Command mode

Interface configuration mode.

Usage guidelines

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.

Examples

```
DES-7200(config-if)# ipv6 nd other-config-flag
```

Related

Command	Description

	show ipv6 interface	Show the interface information**.**

3.1.10 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 it to 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

Default configuration	The default value in RA is 0 (unspecified); the interval for retransmitting NS is 1000ms(1s).
Command mode	Interface configuration mode.
Usage guidelines	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.
Examples	`DES-7200(conifig-if)# ipv6 nd ns-interval 2000`

Related commands	**Command**	**Description**
	show ipv6 interface	Show the interface information**.**

3.1.11 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 it to the default setting.

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

no ipv6 nd prefix {*ipv6-prefix/prefix-length* | **default** }[[**off-link**] [**no-autoconfig**] | [**no-advertise**]]

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*	Set the dead line for the valid lifetime and that of the preferred lifetime, in day, month, year, hour, minute.
infinite	Indicate that the prefix is always valid.
default	Set the default perfix.
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	Indicate that the RA prefix received by the host cannot be used for auto address configuration.

Default configuration

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

This command can be used to configure the parameters of

guidelines

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).

Examples

The following example adds a prefix for SVI 1.

```
DES-7200(config)# interface vlan 1
DES-7200(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):

```
DES-7200(config)# interface vlan 1
DES-7200(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	Show the RA information of an interface.

3.1.12 ipv6 nd ra-hoplimit

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

ipv6 nd ra-hoplimit *value*

no ipv6 nd ra-hoplimit

Parameter description

Parameter	Description
value	Hopcount

Default configuration

The default value is 64.

Command mode

Interface configuration mode.

Usage guidelines

It is used to set the hopcount of the RA message.

Examples

```
DES-7200(config -if)# ipv6 nd ra-hoplimit 110
```

Related commands

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

3.1.13 ipv6 nd ra-interval

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

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

no ipv6 nd ra-interval

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

Default configuration	200s. The actual interval of sending the RA message will be fluctuated 20% based on 200s.
Command mode	Interface configuration mode.
Usage guidelines	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.
Examples	`DES-7200(conifig-if)# ipv6 nd ra-interval 110` `DES-7200(config-if)# ipv6 nd ra-interval min-max 110 120`

Related commands

Command	Description
show ipv6 interface	Show the interface information.
ipv6 nd ra-lifetime	Set the lifetime of the device.
ipv6 nd ra-hoplimit	Set the hopfcount of the RA message.
ipv6 nd ra-mtu	Set the MTU of the RA message.

3.1.14 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 it to 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, 0-9000.

Default configuration 1800s.

Command mode Interface configuration mode.

Usage guidelines 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).

Examples

```
DES-7200(conifig-if)# ipv6 nd ra-lifetime 2000
```

Related commands

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

3.1.15 ipv6 nd ra-mtu

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

ipv6 nd ra-mtu *value*

no ipv6 nd ra-mtu

Parameter description

Parameter	Description
value	MTU value, 0-4294967295.

Default configuration IPv6 MTU value of the network interface.

Command mode	Interface configuration mode.
Usage guidelines	If it is specified as 0, the RA will not have the MTU option.
Examples	`DES-7200(config -if)# ipv6 nd ra-mtu 1400`

Related commands

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

3.1.16 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 it to 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 0 to 3600000 milliseconds.

Default configuration	The default value in RA is 0 (unspecified); the reachable time for the neighbor is 30000ms(30s) when the device discovers the neighbor.
Command mode	Interface configuration mode.
Usage guidelines	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.

Examples

```
DES-7200(config-if)# ipv6 nd reachable-time 1000000
```

Related commands

Command	Description
show ipv6 interface	Show the interface information.

3.1.17 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

Default configuration	The RA message is not sent on the IPv6 interface by default.
Command mode	Interface configuration mode.
Usage guidelines	This command suppresses the sending of the RA message on an interface.

Examples

```
DES-7200(config-if)# ipv6 nd suppress-ra
```

Related commands

Command	Description
show ipv6 interface	Show the interface information.

3.1.18 ipv6 ns-linklocal-src

Use this command to set the local address of the link as the source IP address to send neighbor requests. When **no ipv6 ns-linklocal-src** is executed, the global IP address will be taken as the source address to send neighbor requests.

ipv6 ns-linklocal-src

no ipv6 ns-linklocal-src

Default configuration	The local address of the link is always used as the source address to send neighbor requests.
Command mode	Global configuration mode.
Usage guidelines	None.
Examples	`DES-7200(config)# no ipv6 ns-linklocal-src`

3.1.19 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 disable the function.

ipv6 redirects

no ipv6 redirects

Default configuration	The ICMPv6 redirect message is permitted to be sent on the IPV6 interface.
Command mode	Interface configuration mode.
Usage guidelines	The transmission rate of any ICMPv6 error message is limited. By default, it is 10pps.
Examples	`DES-7200(config-if)# ipv6 redirects`

Related	**Command**	**Description**

	show ipv6 interface	Show the interface information.

3.1.20 ipv6 route

Use this command to configure an IPv6 static route. Use the **no** form of this command to remove the setting.

ipv6 route *ipv6-prefix*/*prefix-length* {*ipv6-address* | *interface-id* [*ipv6-address*] } [*distance*] [**weight** *number*]

	Parameter	Description
Parameter description	*ipv6-prefix*	IPV6 network number following the format specified in RFC4291. prefix-length: Length of the IPv6 prefix. "/" must be added in front of the prefix. Note: The prefix length range of the static routes of DES-7200 is 0 to 64 or 128 to 128.
	ipv6-address	Next-hop IP address to the destination address. It shall be in the format defined in RFC4291. The next-hop IP address and the next-hop outgoing interface can be specified at the same time. Note that if the next-hop IP address is a link-local address, the outgoing interface must be specified.
	vrf-name1	VRF in the nexthop, which must be the multi-protocol VRF with the IPv6 address family configured.
	interface-id	The outgoing interface toward the destination network. If the static route is configured with the outgoing interface but no next-hop address is specified, the destination address will be considered on the link connected with the outgoing interface; that is to say, the static route will be treated as a directly-connected route. Note that if the destination network or next-hop address is a link-local address, the outgoing interface must be specified.

Command mode	Global configuration mode.
Usage guidelines	Note: If the destination IP address or next-hop IP address is a link-local IP address, the outgoing interface must be specified; if the destination address is a link-local IP address, the next-hop must be also a link-local IP address. When configuring a route, the destination IP address and the next-hop IP address shall not be a multicast address. If both the next hop IP address and the outgoing interface are specified, the outgoing interface of the direct route that matches the next hop shall be the same as the configured outgoing interface.
Examples	`DES-7200(config)# ipv6 route 2001::/64 vlan 1 2005::1`
Platform description	None

Related commands

Command	Description
show ipv6 route	Show the IPv6 route information.

3.1.21 ipv6 source-route

Use this command to forward the IPv6 packet with route header. The **no** form of this command disables the forwarding.

ipv6 source-route

no ipv6 source-route

Parameter description	None.
Default configuration	Disabled.
Command mode	Global configuration mode.
Usage	Because of the potential security of the header of type 0

guidelines	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.
Examples	`DES-7200(config)# no ipv6 source-route`
Related commands	None.

3.1.22 ping ipv6

Use this command to diagnose the connectivity of the IPv6 network.

ping ipv6 [*ipv6-address*]

Parameter description

Parameter	Description
ipv6-address	Destination IP address to be diagnosed.

Command mode

Privileged mode.

Usage guidelines

If no destination address is entered in the command, the user interaction mode is entered, and you can specify the parameters. The following table shows the meanings of symbols returned by the **ping** command:

Signs	Meaning
!	The response to each request sent is received.
.	The response to the request sent is not received within a regulated time.
U	The device has no route to the destination host.
R	Parameter error.
F	No system resource is available.
A	The source IP address of the packet is not selected.

D	The network interface is in the **Down** status, or the IPv6 function is disabled on the the interface (for example, IP address collision is detected).
?	Unknown error

Examples

```
DES-7200# ping ipv6 fec0::1
```

3.2 Showing Related Command

3.2.1 clear ipv6 neighbors

Use this command to clear the dynamically learned neighbors.

clrear ipv6 neighbors

Parameter description

Parameter	Description
vrf-name	VRF name

Command mode

Privileged mode.

Usage guidelines

This command can be used to clear all the neighbors dynamically learned by the neighbor discovering. Note that the static neighbors will not be cleared.

Examples

```
DES-7200# clear ipv6 neighbors
```

Related commands

Command	Description
ipv6 neighbor	Configure the neighbor.
show ipv6 neighbors	Show the neighbor information.

Platform description

N/A

3.2.2 show ipv6 address

Use this command to show the IPv6 addresses.

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

Parameter description

Parameter	Description
interface-name	Interface name

Command mode

Privileged mode.

Usage guidelines

N/A

Examples

N/A

Platform description

N/A

3.2.3 show ipv6 general-prefix

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

show ipv6 general-prefix

Command mode

Privileged mode.

Usage guidelines

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

Examples

The following example shows the information of the general prefix

```
DES-7200# 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

Command	Description

	ipv6 general-prefix	Configure the general prefix.

3.2.4 show ipv6 interface

Use this command to show the IPv6 interface information.

show ipv6 interface [*interface-id*] [**ra-info**]

	Parameter	Description
Parameter description	*interface-id*	Interface (including Ethernet interface, aggregateport, or SVI)
	ra-info	Show the RA information of the interface.

Command mode	Privileged mode.
Usage guidelines	Use this command to show the address configuration, ND configuration and other information of an IPv6 interface.

Examples

```
DES-7200# 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.

```
DES-7200# 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.

3.2.5 show ipv6 neighbors

Use this command to show the IPv6 neighbors.

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

show ipv6 neighbors static

Parameter description

Parameter	Description
verbose	Show the neighbor details.
static	Show the validity status of static neighbors.
interface-id	Show the neighbors of the specified interface.
ipv6-addres	Show the neighbors of the specified IPv6 address.

Command mode

Privileged mode.

Usage guidelines

Show the neighbors on the SVI 1 interface:

```
DES-7200# 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:

```
DES-7200# 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.

Examples

```
DES-7200# show ipv6 neighbors
```

Related commands

Command	Description
ipv6 neighbor	Configure a neighbor.

3.2.6 show ipv6 neighbors statistics

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

show ipv6 neighbors statistics

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

show ipv6 neighbors statistics all

Parameter description

Parameter	Description
-	-

Command mode

Privileged mode.

Examples

N/A

Related commands

Command	Description
-	-

Platform description

Supported on all platforms.

3.2.7 show ipv6 packet statistics

Use this command to show the statistics of IPv6 packets.

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

Parameter description

Parameter	Description
total	Show total statistics of all interfaces.
interface-name	Interface name

Command mode

Privileged mode.

Usage guidelines

N/A

Examples

N/A

Related commands

Command	Description
-	-

Platform description

Supported on all platforms.

3.2.8 show ipv6 route

Use this command to show the IPv6 route information.

show ipv6 route [**static** | **local** | **connected**]

Parameter description

Parameter	Description
static	Show the static routes.
local	Show the local routes.
connected	Show the directly-connected routes.

Command mode

Privileged mode.

Usage guidelines

Use this command to view the routing table.

Examples

```
DES-7200# show ipv6 route
Codes: C - Connected, L - Local, S - Static, R - RIP, B
```

```
- BGP
      I1 - ISIS L1, I2 - ISIS L2, IA - IIS interarea
L    ::1/128
     via ::1, loopback 0
C    fa::/64
     via ::, vlan 1
L    fa::1/128
     via ::, loopback 0
C    2001::/64
     via ::, vlan 2
L    2001::1/128
     via ::, loopback 0
L    fe80::/10
     via ::1, Null0
C    fe80::/64
     via ::, vlan 1
L    fe80::200:ff:fe00:1/128
     via ::, loopback 0
C    fe80::/64
     via ::, vlan 2
```

Related commands

Command	Description
ipv6 route	Configure a static route.

Platform description N/A

3.2.9 show ipv6 route summary

Use the following command to show the statistics of one IPv6 route table.

show ipv6 route summary

Use the following command to show the statistics of all IPv6 route tables.

show ipv6 route summary all

Parameter description

Parameter	Description
-	-

Command mode Privileged mode.

Usage N/A

guidelines	
Examples	N/A

Related commands	**Command**	**Description**
	ipv6 route	Configure a static route.

Platform description	N/A

3.2.10 show ipv6 routers

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

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

Parameter description	**Parameter**	**Description**
	interface-type interface-number	(Optional) Show the routing advertisement of the specified interface.

Command mode	Privileged mode.
Usage guidelines	Use this command to show the neighbor routers and the routing advertisement. If no interface is specified, all the routing advertisement of this device will be displayed.

Examples	The following example shows the IPv6 router
	`DES-7200# show ipv6 routers`
	`Router FE80::2D0:F8FF:FEC1:C6E1 on VLAN 2, last update 62 sec`
	`  Hops 64, Lifetime 1800 sec, ManagedFlag=0, OtherFlag=0, MTU=1500`
	`  Preference=MEDIUM`
	`  Reachable time 0 msec, Retransmit time 0 msec`
	`  Prefix 6001:3::/64 onlink autoconfig`
	`    Valid lifetime 2592000 sec, preferred lifetime 604800 sec`

```
  Prefix 6001:2::/64 onlink autoconfig
    Valid lifetime 2592000 sec, preferred lifetime 604800
sec
```

4 IPv6 Tunnel Configuration Commands

4.1 Configuration Related Commands

4.1.1 tunnel destination

Use this command to specify the destination address for the tunnel. Use the **no** form of this command to remove the setting.

tunnel destination {*ipv4-address* **}**

no tunnel destination

Parameter description

Parameter	Description
ipv4-address	Destination address of the tunnel, namely the IPv4 address in the other side of the tunnle..

Default configuration

The destination address encapsulated by the tunnel is not configured by default.

Command mode

Interface configuration mode.

Usage guidelines

A device shall not be configured multiple tunnels with the same encapsulation type, source address and destination address.

Note: For auto tunnel (isatap), the destination address shall not be configured.

Examples

The following example configures an IPv6 manual tunnel.

```
DES-7200(config)# interface tunnel 1
DES-7200(config-if)# tunnel mode ipv6ip
DES-7200(config-if)# tunnel source vlan 1
DES-7200(config-if)# tunnel destination 192.168.5.1
```

Related commands

Command	Description
tunnel source	Configure the source IP address of the tunnel.
tunnel mode	Configure the mode of a tunnel.

4.1.2 tunnel mode ipv6ip

Use this command to configure static IPv6 tunnel mode. Use the **no** form of this command to restore it to the default IPv6 tunnel mode.

tunnel mode ipv6ip [isatap]

no tunnel mode

Parameter description

Parameter	Description
isatap	Configure the tunnel as an auto ISATAP tunnel.

Default configuration

The type of the configured IPv6 tunnel is a tunnel configured manually.

Command mode

Interface configuration mode.

Usage guidelines

After a tunnel is created, it is considered to be manual tunnel by default. You can also use **tunnel mode ipv6ip** without any parameter to set a tunnel to manual tunnel. For an auto tunnel, no destination address is specified.

Examples

The following example configures an ISATAP tunnel.

```
DES-7200(config)# interface tunnel 1
DES-7200(config-if)# tunnel mode ipv6ip isatap
DES-7200(config-if)# tunnel source vlan 1
```

Related commands

Command	Description
tunnel source	Configure the source address of the tunnel.
tunnel destination	Configure the destination address of a tunnel.

4.1.3 tunnel source

Use this command to specify the source IP address for the tunnel. Use the **no** form of this command to remove the setting.

tunnel source {*ipv4-address* | *interface-type interface-number*}

no tunnel source

Parameter description

Parameter	Description
ipv4-address	Source IPv4 address of the tunnel used as the source IP address of the packets to be transmitted through the tunnel.
interface-type interface-number	Interface referenced by the tunnel, which will be used as the source IPv4 address of the packets to be transmitted through the tunnel.

Default configuration

No tunnel source address is configured by default.

Command mode

Interface configuration mode.

Usage guidelines

The source IP address of a tunnel can be a specified IPv4 address or an IPv4 address of an interface.

Examples

The following example configures an IPv6 manual tunnel.

```
DES-7200(config)# interface tunnel 1
DES-7200(config-if)# tunnel mode ipv6ip
DES-7200(config-if)# tunnel source vlan 1
DES-7200(config-if)# tunnel destination 192.168.5.1
```

Related commands

Command	Description
tunnel mode	Configure the mode of a tunnel.
tunnel destination	Configure the destination address of a tunnel.

5 DHCP Configuration Commands

5.1 DHCP Configuration Related Command

5.1.1 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.The **no** form of this command can be used to remove the network segment range.

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 adress in the network segment range.

Default

By default, the associated CLASS is not configured the network segment range. It is defaulted to the address pool range.

Command mode

Address pool CLASS configuration mode.

Usage guidelines

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 CLASSs. 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.

Examples

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

```
DES-7200(config)# ip dhcp pool mypool0
DES-7200(dhcp-config)# class class1
DES-7200 (config-dhcp-pool-class)# address range 172.16.1.1 172.16.1.8
```

Related commands

Command	Description
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.
class	Configure the CLASS associated with the DHCP address pool and enter into the address pool CLASS configuration mode.

5.1.2 bootfile

Use this command to define the startup mapping file name of the DHCP client in the DHCP address pool configuration mode.The **no** form of this command can be used to remove the definition.

bootfile file-name

no bootfile

Parameter description

Parameter	Description
file-name	Startup file name.

Default

No startup file name is defined, by default.

Command mode

DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below defines the device.conf as the startup file name.

```
bootfile device.conf
```

Related commands

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

5.1.3 class

Use this command to configure the associted CLASS in the DHCP address pool.The **no** form of this command is used to delete the associated CLASS.

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.

Default

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

Command mode

DHCP address pool configuration mode.

Usage guidelines	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, this CLASS's default network segment range is same as the range of address pool where the CLASS is.

Examples	The configuration example below configures the address *mypool0* to associate with class1.
	`DES-7200(config)# ip dhcp pool mypool0`
	`DES-7200(dhcp-config)# class class1`

Related commands

Command	Description
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.4 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. The **no** form of this command can be used to delete the client ID.

client-identifier *unique-identifier*

no client-identifier

Parameter description

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

Default N/A.

Command mode DHCP address pool configuration mode.

Usage guidelines

When some DHCP clients request the DHCP server to assign IP addresses, they use their client IDs rather then their hardware addresses. The client ID consists of media type, MAC address 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.

Examples

The configuration example below 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	Define the hardware address of DHCP client.
host	Define the IP address and network mask, which is used to configure the DHCP manual binding.

	ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.5 client-name

Use this command to define the name of the DHCP client in the DHPC address pool configuration mode.The **no** form of this command is used to delete the name of the DHCP client.

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.

Default	No client name is defined.
Command mode	DHCP address pool configuration mode.
Usage guidelines	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.
Examples	The configuration example below defines a string river as the name of the client. `client-name river`

Related commands	**Command**	**Description**
	host	Define the IP address and network mask, which is used to configure the DHCP manual binding.

	ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.6 default-router

Use this command to define the default gateway of the DHCP client in the DHPC address pool configuration mode.The **no** form of this command can be used to delete the definition of the default gateway.

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

no default-router

Parameter description

Parameter	Description
ip-address	Define 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.

Default No gateway is defined by default.

Command mode DHCP address pool configuration mode.

Usage guidelines 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.

Examples The configuration example below defines 192.168.12.1 as the default gateway.

```
default-router 192.168.12.1
```

Related commands

Command	Description
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.7 dns-server

Use this command to define the DNS server of the DHCP client in the DHPC address pool configuration mode. The **no** form of this command can be used to delete the definition of the DNS server.

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

no dns-server

Parameter description

Parameter	Description
ip-address	Define 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*	Use the DNS server learned by the DHCP client of the DES-7200 as the DNS server of the DHCP client.

Default

No DNS server is defined by default.

Command mode

DHCP address pool configuration mode.

Usage guidelines

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 DES-7200 also acts as the DHCP client, the DNS server information obtained by the client can be transmitted to the DHCP client.

Examples

The configuration example below specifies the DNS server 192.168.12.3 for the DHCP client.

```
dns-server 192.168.12.3
```

Related commands

Command	Description
domain-name	Define the suffix domain name of the DHCP client.

ip address dhcp	Enable the DHCP client on the interface to obtain the IP address information.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.8 domain-name

Use this command to define the suffix domain name of the DHCP client in the DHPC address pool configuration mode. The **no** form of this command can be used to delete the suffix domain name.

domain-name *domain-name*

no domain-name

Parameter description

Parameter	Description
domain-name	Define the suffix domain name string of the DHCP client.

Default No suffix domain name by default.

Command mode DHCP address pool configuration mode.

Usage guidelines 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.

Examples The configuration example below defines the suffix domain name i-net.com.cn for the DHCP client.

```
domain-name i-net.com.cn
```

Related commands

Command	Description
dns-server	Define the DNS server of the DHCP client.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.9 hardware-address

Use this command to define the hardware address of the DHCP client in the DHPC address pool configuration mode.The **no** form of this command can be used to delete the definition of the hardware address.

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)

Default

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 guidelines

This command can be used only when the DHCP is defined by manual binding.

Examples

The configuration example below defines the MAC address 00d0.f838.bf3d with the type ethernet.

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

Related commands

Command	Description
client-identifier	Define the unique ID of the DHCP client (Indicated by the hexadecimal numeral, separated by dot).

host	Define the IP address and network mask, which is used to configure the DHCP manual binding.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.10 host

Use this command to define the IP address and network mask of the DHCP client host in the DHCP address pool configuration mode. The **no** form of this command can be used to delete the definition of the IP address and network mask for the DHCP client.

host *ip-address* [*netmask*]

no host

Parameter description

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

Default No IP address or network mask of the host is defined.

Command mode DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below 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	Define the unique ID of the DHCP client (Indicated in hex, separated by dot).
	hardware-address	Define the hardware address of DHCP client.
	ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.11 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. The **no** form of this command can be used to cancel this configuration.

ip address dhcp

no ip address dhcp

Default	The interface cannot obtain the ID address by the DHCP by default.
Command mode	Interface configuration mode.
Usage guidelines	When requesting the IP address, the DHCP client of the DES-7200 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. The client of the DES-7200 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.
Examples	The configuration example below makes the FastEthernet 0 port obtain the IP address automatically.

```
interface fastEthernet 0
ip address dhcp
```

Related commands

Command	Description
dns-server	Define the DNS server of DHCP client.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.12 ip dhcp class

Use this command to define a CLASS and enter the global CLASS configuration mode. The **no** form of this command can be used to delete the global CLASS.

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.

Default By default, the class is not configured.

Command mode Global configuration mode.

Usage guidelines After executing this command, it enters the global CLASS configuration mode which is shown as "`DES-7200(config-dhcp-class)#`". In this configuration mode, user can configure the Option82 information that matches the CLASS and the CLASS identification information.

Examples The configuration example below configures a global CLASS.

`DES-7200(config)#` **`ip dhcp class`** *`myclass`*

Related commands

Command	Description
-	-

5.1.13 ip dhcp database write-delay

Use this command to configure the function of writing the DHCP lease data-binding information into the FLASH timely in the global configuration mode. The **no** form of this command can be used to disable the function of writing timely.

ip dhcp database write-delay *time*

no ip dhcp database write-delay

Parameter description

Parameter	Description
time	The interval at which the system writes the DHCP lease binding database information into the flash.

Default Disabled

Command mode Global configuration mode.

Usage guidelines By configuring this command, you can write the information of DHCP lease binding database into the FLASH files to prevent the loss of user information after restarting the device.

Examples The configuration example below sets the interval at which the switch writes the information into FLASH as 3600s.

```
DES-7200(config)# ip dhcp database write-delay 3600
```

Related commands

Command	Description
-	-

5.1.14 ip dhcp database write-to-flash

Use this command to write the information of DHCP lease binding data into FLASH files in the real-time..

ip dhcp database write-to-flash

Parameter description

Parameter	Description
-	-

Default	N/A
Command mode	Global configuration mode.
Usage guidelines	By configuring this command, you can write the information of DHCP lease binding database into the FLASH files in real-time.
Examples	The configuration example below writes the binding database information into FLASH manually. `DES-7200(config)# ip dhcp database write-to-flash`

Related commands

Command	Description
-	-

5.1.15 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. The **no** form of this command can be used to cancel this definition.

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	Exclude the IP address, or exclude the start IP address within the range of the IP address.
high-ip-address	Exclude the end IP address within the range of the IP address.

Default	The DHCP server assigns the IP addresses of the whole address pool by default.
Command mode	Global configuration mode.

Usage guidelines	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.
Examples	In the configuration example below, 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	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.
network (DHCP)	Define the network number and network mask of the DHCP address pool.

5.1.16 ip dhcp ping packet

Use this command to configure the times of pinging the IP address when the DHCP server detects address conflict in the global configuration mode. The **no** form of this command is used to restore it to the default configuration.

ip dhcp ping packet [*number*]

no ip dhcp ping packet

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.

Default	The Ping operation sends two packets by default.
Command mode	Global configuration mode.

Usage guidelines	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.
Examples	The configuration example below 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	Clear the DHCP history conflict record.
ip dhcp ping packet	Configure 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	Show the DHCP server detects address conflict when it assigns an IP address.

5.1.17 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. The **no** form of this command can be used to restore it to the default configuration.

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.

Default	The default timeout is 500 seconds.

Command mode	Global configuration mode.
Usage guidelines	This command defines the time that the DHCP server waits for a ping response packet.
Examples	In the configuration example below, the waiting time of the ping response packet is 600ms. `ip dhcp ping timeout 600`

Related commands

Command	Description
clear ip dhcp conflict	Clear the DHCP history conflict record.
ip dhcp ping packets	Define 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	Show the address conflict the DHCP server detects when it assigns an IP address.

5.1.18 ip dhcp pool

Use this command to define a name of the DHCP address pool and enter into the DHCP address pool configuration mode in the global configuration mode.The **no** form of this command can be used to delete the DHCP address pool.

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.

Default	No DHCP address pool is defined by default.
Command mode	Global configuration mode.

Usage guidelines	Execute the command to enter into the DHCP address pool configuration mode: `DES-7200(dhcp-config)#` In this configuration mode, configure the IP address range, the DNS server and the default gateway.
Examples	The configuration example below defines a DHCP address pool with the name mypool0. `ip dhcp pool mypool0`

Related commands

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

5.1.19 ip dhcp use class

Use this command to enable the CLASS to allocate addresses in the global configuration mode.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
-	-

Default	Enabled
Command mode	Global configuration mode.
Usage guidelines	N/A

Examples

The configuration example below enables the CLASS to allocate addresses.

```
DES-7200(config)# ip dhcp use class
```

Related commands

Command	Description
-	-

5.1.20 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. The **no** form of this command can be used to restore it to the default configuration.

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.

Default

The lease is 1 days, by default.

Command mode

DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below sets the DHCP lease to 1 hour.

```
lease 0 1
```

The configuration example below sets the DHCP lease to 1 minute.

```
lease 0 0 1
```

Related commands

Command	Description
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.21 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 delete the WINS server.

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.

Default No WINS server is defined, by default.

Command mode DHCP address pool configuration mode.

Usage guidelines 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.

Examples The configuration example below specifies the WINS server 192.168.12.3 for the DHCP client.

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

Related

Command	Description

ip address dhcp	Enable the DHCP client on the interface to obtain the IP address.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.22 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. The **no** form of this command can be used to delete the configuration of the NetBIOS node type.

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

Default No type of the NetBIOS node is defined, by default.

Command mode DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below sets the NetBIOS node of Microsoft DHCP client as Hybrid.

```
netbios-node-type h-node
```

Related commands

Command	Description
ip dhcp pool	Define the name of DHCP address pool and enter into the DHCP address pool configuration mode.
netbios-name-server	Configure the WINS name server of the Microsoft DHCP client NETBIOS.

5.1.23 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. The **no** form of this command can be used to delete the definition.

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.

Default No network number or network mask is defined, by default.

Command mode DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below 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	Define the IP addresses that the DHCP server cannot assign to the clients.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.24 next-server

Use this command to define the startup sever list that the DHCP client accesses during startup in the DHCP address configuration mode. The **no** form of this command can be used to delete the definition of the startup server list.

next-server *ip-address* [*ip-address2…ip-address8*]

no next-server

Parameter description

Parameter	Description
ip-address	Define 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.

Default

N/A.

Command mode

DHCP address pool configuration mode.

Usage guidelines

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.

Examples

The configuration example below specifies the startup server 192.168.12.4 for the DHCP client.

```
next-server 192.168.12.4
```

Related commands

Command	Description
bootfile	Define the default startup mapping file name of the DHCP client.
ip dhcp pool	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.
ip help-address	Define the Helper address on the interface.
option	Configure the option of the DES-7200 DHCP server.

5.1.25 option

Use this command to configure the option of the DHCP server in the DHCP address pool configuration mode. The **no** form of this command can be used to delete the definition of option.

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

no option

Parameter description

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

Default N/A.

Command mode Global configuration mode.

Usage guidelines

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.

Examples

The configuration example below 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.

```
DES-7200(dhcp-config)# option 19 hex 1
```

The configuration example below 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	Define the name of the DHCP address pool and enter into the DHCP address pool configuration mode.

5.1.26 relay agent information

Use this command to enter the Option82 matching information configuration mode in the global CLASS configuration mode. The **no** form of this command can be used to delete the Option82 matching information of the CLASS.

relay agent information

no relay agent information

Parameter description

Parameter	Description
-	-

Default N/A.

Command mode Global CLASS configuration mode.

Usage guidelines

After executing this command, it enters the Option82 matching information configuration mode which is shown as "`DES-7200 (config-dhcp-class-relayinfo)#`".

In this configuration mode, user can configure the class matching multiple Option82 information.

Examples

The configuration example below configures a global CLASS and enter the Option82 matching information configuration mode.

```
DES-7200(config)# ip dhcp class myclass
DES-7200(config-dhcp-class)# relay agent information
DES-7200(config-dhcp-class-relayinfo)#
```

Related

Command	Description

	ip dhcp class	Define a CLASS and enter the global CLASS configuration mode.

5.1.27 relay-information hex

Use this command to enter the Option82 matching information configuraiton mode. The **no** form of this command can be used 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.

Default N/A.

Command mode Global CLASS configuration mode.

Usage guidelines N/A

Examples

The configuration example below configures a global CLASS which can match multiple Option82 infomration.

```
DES-7200(config)# ip dhcp class myclass
DES-7200(config-dhcp-class)# relay agent information
DES-7200(config-dhcp-class-relayinfo)#
relay-information
 hex 0102256535
DES-7200(config-dhcp-class-relayinfo)#
relay-information
 hex 010225654565
DES-7200(config-dhcp-class-relayinfo)#
relay-information
 hex 060225654565
DES-7200(config-dhcp-class-relayinfo)#
```

```
relay-information
 hex 060223*
```

Related commands

Command	Description
ip dhcp class	Define a CLASS and enter the global CLASS configuraiton mode.
relay agent information	Enter the Option82 matching information configuratin mode.

5.1.28 remark

Use this command to configure the identification which is used to describe the CLASS in this global CLASS configuraiton mode. The **no** form of this command can be used to delete the identification.

remark *class-remark*

no remark

Parameter description

Parameter	Description
class-remark	Information used to indentify the CLASS, it can be the character strings with space in them.

Default N/A.

Command mode Global CLASS configuration mode.

Usage guidelines N/A

Examples The configuration example below configures the identification information for a global CLASS.

```
DES-7200(config)# ip dhcp class myclass
DES-7200(config-dhcp-class)# remark used in #1 build
```

Related commands

Command	Description
ip dhcp class	Define a CLASS and enter the global CLASS configuration mode.

5.1.29 service dhcp

Use this command to enable the DHCP server and the DHCP relay on the device in the global configuration mode. The **no** form of this command can be used to disable the DHCP server and the DHCP relay.

service dhcp

no service dhcp

Parameter description	N/A.
Default	Disabled.
Command mode	Global configuration mode.
Usage guidelines	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.
Examples	In the following configuration example, the device has enabled the DHCP server and the DHCP relay feature. `service dhcp`

Related commands

Command	Description
show ip dhcp server statistics	Show various statistics information of the DHCP server.

5.2 Showing and Monitoring Commands

5.2.1 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
*	Delete all DHCP bindings.

	ip-address	Delete the binding of the specified IP addresses.

Default N/A.

Command mode Privileged mode.

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

Examples The example below 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	Show the address binding of the DHCP server.

5.2.2 clear ip dhcp conflict

Use this command to clear the DHCP address conflict record in the privileged user mode:

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

Parameter description

Parameter	Description
*	Delete all DHCP address conflict records.
ip-address	Delete the conflict record of the specified IP addresses.

Default N/A.

Command mode Privileged mode.

Usage guidelines	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** can be used to delete the history conflict record.
Examples	The example below clears all address conflict records. `clear ip dhcp conflict *`

Related commands

Command	Description
ip dhcp ping packets	Define 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	Show the address conflict that the DHCP server detects when it assigns an IP address.

5.2.3 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

Default	N/A.
Command mode	Privileged mode.
Usage guidelines	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.
Examples	The example below clears the statistics record of the DHCP server. `clear ip dhcp server statistics`

Related commands

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

5.2.4 debug ip dhcp client

Use this command to carry out the DHCP client debugging in the privileged user mode:

debug ip dhcp client

no debug ip dhcp client

Parameter description N/A.

Default Disabled.

Command mode Privileged mode.

Usage guidelines This command is used to show the main message content of the DHCP client during the interaction of the servers and the processing status.

Examples The example below turns on the debugging switch of the DHCP client in the equipment.

```
debug ip dhcp client
```

5.2.5 debug ip dhcp server

Use this command to carry out the DHCP Server debugging in the privileged user mode:

debug ip dhcp server { **event** | **packet** }

no debug ip dhcp server { **event** | **packet** }

Parameter description

Parameter	Description
event	Show the DHCP message.
packet	Show the DHCP packet.

Default Disabled.

Command mode	Privileged mode.
Usage guidelines	This command is used to show the main message content of the dhcp server during the interaction of the clients and the processing status.
Examples	The example below turns on the debugging switch of the DHCP server in the equipment. `DES-7200# debug ip dhcp server packet`

5.2.6 show dhcp lease

Use this command to show the lease information of the IP address obtained by the DHCP client.

show dhcp lease

Parameter description	N/A.
Default	N/A.
Command mode	Privileged mode.
Usage guidelines	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.

Examples	The following is the result of the **show dhcp lease**.
	`DES-7200# 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

5.2.7 show ip dhcp binding

Use this command to show the binding condition of the DHCP address.

show ip dhcp binding [*ip-address*]

Parameter description

Parameter	Description
ip-address	(Optional) Only show the binding condition of the specified IP addresses.

Default

N/A.

Command mode

Privileged mode.

Usage guidelines

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.

Examples

The following is the result of the **show ip dhcp binding**.

```
DES-7200# show ip dhcp binding
IP address    Client-Identifier/  Lease expiration  Type
              Hardware address
192.168.1.2         00d0.f866.4777                  IDLE
Manual
```

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	Clear the DHCP address binding table.

5.2.8 show ip dhcp conflict

Use this command to show the conflict history record of the DHCP sever.

show ip dhcp conflict

Parameter description N/A.

Default N/A.

Command mode Privileged mode.

Usage guidelines This command can show the conflict address list and excluded address list detected by the DHCP server.

Examples The following is the output result of the **show ip dhcp conflict** command.

```
DES-7200# show ip dhcp conflict
IP address    Detection Method
```

```
192.168.12.1    Ping

dhcpd excluded ipaddress
 192.168.12.100
```

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.**
dhcpd excluded ipaddress	**The range of excluded addresses.**

Related commands

Command	Description
clear ip dhcp confict	Clear the DHCP conflict record.

5.2.9 show ip dhcp server statistics

Use this command to show the statistics of the DHCP server.

show ip dhcp server statistics

Parameter description N/A.

Default N/A.

Command mode Privileged mode.

Usage guidelines This command shows the statistics of the DHCP server.

Examples

The following is the output result of the **show ip dhcp server statistics** command.

```
DES-7200# show ip dhcp server statistics
Lease count             7
Address pools           4
Automatic bindings      4
Manual bindings         0
```

```
Expired bindings         0
Malformed messages 2
Message                 Received
BOOTREQUEST              216
DHCPDISCOVER             33
DHCPREQUEST              25
DHCPDECLINE              0
DHCPRELEASE              1
DHCPINFORM               150
Message                 Sent
BOOTREPLY                16
DHCPOFFER                9
DHCPACK                  7
DHCPNAK                  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	Delete the DHCP server statistics.

6 DHCP Relay Configuration Commands

6.1 DHCP Relay Configuration Commands

6.1.1 ip dhcp relay check server-id

Use this command to enable the **ip dhcp relay check** *server-id* function. The **no** form of this command is used to disable the **ip dhcp relay check** *server-id* function.

[**no**] **ip dhcp relay check server-id**

Default	Disabled.
Command mode	Global configuration mode.
Usage guidelines	Switch will select the server to be sent according to server-id option when forwarding DHCP REQUEST via this command. Wihout this comand configured, the switch forwards the DHCP REQUEST to all configured DHCP servers.

Examples	The following example enables the ip dhcp relay check server-id function.
	`DES-7200# configure terminal`
	`DES-7200(config)# ip dhcp relay check server-id`

Related commands

Command	Description
service dhcp	Enable the DHCP Relay.

Platform description	This command is only supported by the switches.

6.1.2 ip dhcp relay information option dot1x

Use this command to enable the **dhcp option dot1x** function.. The **no** form of the command is used to disable the **dhcp option dot1x** function.

[**no**] **ip dhcp relay information option dot1x**

Default	Disabled.
Command mode	Global configuration mode.
Usage guidelines	It is necessary to enable the DHCP Relay, and combine with the 802.1x related configuration to configure this command.

Examples	The following example enables the DHCP option dot1x function on the device.
	`DES-7200# configure terminal`
	`DES-7200(config)# ip dhcp relay information option dot1x`

Related commands

Command	Description
service dhcp	Enable the DHCP Relay.
ip dhcp relay information option dot1x access-group	Configure the option dot1x acl.

Platform description	This command is only supported by switches.

6.1.3 ip dhcp relay information option dot1x access-group

Use this command to configure the **dhcp option dot1x acl**. The **no** form of this command is used to disable the **dhcp option dot1x acl**.

[**no**] **ip dhcp relay information option dot1x access-group** *acl-name*

Default	No ACL is associated with.

Command mode

Global configuration mode.

Usage guidelines

Be sure that the ACL does not conflict with the existing ACE of the configured ACL on the interface.

Examples

The following example enables the dhcp option dot1x acl function.

```
DES-7200# configure terminal
DES-7200(config)# ip access-list extended DenyAccessEachOtherOfUnauthrize
DES-7200(config-ext-nacl)# permit ip any host 192.168.3.1
```

//Permit sending the packets to the gateway.

```
DES-7200(config-ext-nacl)# permit ip any host 192.168.4.1
DES-7200(config-ext-nacl)# permit ip any host 192.168.5.1
DES-7200(config-ext-nacl)# permit ip host 192.168.3.1 any
```

// Permit the communication between the packets whose source IP address is that of the gateway.

```
DES-7200(config-ext-nacl)# permit ip host 192.168.4.1 any
DES-7200(config-ext-nacl)# permit ip host 192.168.5.1 any
DES-7200(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.3.0 0.0.0.255
```

//Deny the exchange between the unauthenticated users.

```
DES-7200(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.4.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.3.0 0.0.0.255 192.168.5.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.4.0 0.0.0.255 192.168.4.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.4.0 0.0.0.255 192.168.5.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.5.0 0.0.0.255 192.168.5.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.5.0 0.0.0.255 192.168.3.0 0.0.0.255
DES-7200(config-ext-nacl)# deny ip 192.168.5.0 0.0.0.255 192.168.4.0 0.0.0.255
DES-7200(config-ext-nacl)# exit
DES-7200(config)# ip dhcp relay information option dot1x access-group DenyAccessEachOtherOfUnauthrize
```

Related commands

Command	Description
service dhcp	Enable the DHCP Relay.
ip dhcp relay information option dot1x	Enable the DHCP option dot1x function.

Platform description

This command is only supported by switches.

6.1.4 ip dhcp relay information option82

Use this command to configure to enable the **ip dhcp relay information option82** function. The **no** form of this command is used to disable the **ip dhcp relay information option82** function.

[**no**] **ip dhcp relay information option82**

Default

Disabled.

Command mode

Global configuration mode.

Usage guidelines

This command is exclusive with the **option dot1x** command.

Examples

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

```
DES-7200# configure terminal
DES-7200(config)# Ip dhcp relay information option82
```

Related commands

Command	Description
service dhcp	Enable the DHCP Relay.
ip dhcp relay information option dot1x	Enable the DHCP option dot1x function.

Platform description

This command is only supported by switches.

6.1.5 ip dhcp relay information option vpn

Use this command to configure to enable the DHCP Relay Aware VRF function on the DHCP Relay device. The **no** form of this command is used to disable this function.

Default	Disabled.
Command mode	Global configuration mode.
Usage guidelines	This command is exclusive with the **option dot1x** and **option82** command.

Examples	The following example enables the DHCP Relay Aware VRF function on the DHCP Relay device.
	`DES-7200# configure terminal`
	`DES-7200(config)#Ip dhcp relay information option vpn`

Related commands

Command	Description
ip dhcp relay information option82	Enable the DHCP option82 function.
ip dhcp relay information option dot1x	Enable the DHCP option dot1x function.

Platform description	This command is only supported by switches.

6.1.6 ip dhcp relay suppression

Use this command to enable the DHCP binding globally. The **no** form of this command disables the DHCP binding globally and enables the **DHCP relay** suppression on the port.

[**no**] **ip dhcp relay suppression**

Default configuration	Disabled.

Command mode	Interface configuration mode.
Usage guidelines	After executing this command, the system will not relay the DHCP request message on the interface.

Examples	The following example enables the relay suppression function on the interface 1.
	`DES-7200# configure terminal`
	`DES-7200(config)# interface fastEthernet 0/1`
	`DES-7200(config-if)# ip dhcp relay suppression`
	`DES-7200(config-if)# exit`
	`DES-7200(config)#`

Related commands

Command	Description
service dhcp	Enable the DHCP Relay.

Platform description	This command is only supported by switches.

6.1.7 ip helper-address

Use this command to add an IP address of the DHCP server. The **no** form of this command deletes 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.

[**no**] **ip helper-address** [**vrf** *vrf-name*]*A.B.C.*

Default	N/A.
Command mode	Global configuration mode, interface configuration mode.

Usage guidelines	Up to 20 DHCP server 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. The global configuration and port-based configuration of the vrf are slightly different. In the global configuration mode, if the vrf is not specified, the default address of the current server does not belong to any vrf. In the port-based configuration, if the vrf is not specified, the current default server and port configurations belong to the same vrf.

Examples	The following example configures the addresses for two servers.
	1. Set the IP address for the global server to 192.168.1.1
	2. Set the IP address for the vrf instance-based server delp1 to 192.168.2.1
	`DES-7200# configure terminal`
	`DES-7200(config)# ip helper-address 192.168.1.1`
	`DES-7200(config)# ip helper-address vrf dep1 192.168.2.1`

Related commands

Command	Description
service dhcp	Enable the DHCP relay.

6.1.8 service dhcp

Use this command to enable the DHCP relay in the global configuration mode. The **no** form of this command can disable the DHCP relay.

service dhcp

no service dhcp

Default	Disabled.
Command mode	Global configuration mode.
Usage guidelines	The DHCP relay can forward the DHCP requests to other servers, and the returned DHCP response packets to the DHCP client, serving as the relay for DHCP packets.
Examples	In the following configuration example, the device has

enabled the DHCP server and the DHCP relay.

```
DES-7200# configure terminal
DES-7200(config)# service dhcp
```

Related commands

Command	Description
ip helper-address	Add an IP address of the DHCP server.

7 UDP-Helper Module Configuration Commands

7.1 Configuration Related Commands

7.1.1 ip forward-protocol

Use this command to configure the UDP port to enable forwarding. Use the **no** form of this command to disable forwarding on the UDP port.

ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs]**

no ip forward-protocol udp [*port* | **tftp | domain | time | netbios-ns | netbios-dgm | tacacs]**

Parameter description

Parameter	Description
port	Port to enable forwarding. If this parameter is not specified, the broadcast message from the ports 69,53,37,137,138,49 will be forwarded by default.
tftp	Trivial File Transfer Protocol(69) Forward the broadcast message from port 69.
domain	Domain Name System(53) Forward the broadcast message from port 53.
time	Time service(37) Forward the broadcast message from port 37.
netbios-ns	NetBIOS Name Service(137) Forward the broadcast message from port 137.
netbios-dgm	NetBIOS Datagram Service(138) Forward the broadcast message from port 138.
tacacs	TAC Access Control System(49)

		Forward the broadcast message from port 49.

Default configuration	N/A.
Command mode	Global configuration mode.
Usage guidelines	Enabling the UDP-Helper function will forward the broadcast message of the UDP ports 69,53,37,137,138,49 without any additional configuration, by default.
Examples	`DES-7200(config)# ip forward-protocol udp 134`

Related commands

Command	Description
udp-helper enable	Enable the forwarding of the UDP broadcast message.
ip forward-protocol	Configure the UDP port to enalbe forwarding.

7.1.2 ip helper-address

Use this command to configure the destination server which the UDP broadcast message will be forwarded to. Use the **no** form of this command to delete the destination server.

ip helper-address *address*

no ip helper-address *[address]*

Parameter description

Parameter	Description
address	IP address of the destination server in the dotted decimal format. Each interface can support up to 20 server addresses.

Default configuration	N/A.

Command mode	Interface configuration mode.
Usage guidelines	Up to 20 destination servers can be configured on an interface. Once the forwarding destination server is configured someone an interface and UDP-Helper is enabled, the broadcast message of the specified port received from this interface will be sent to the destination server configured on this interface in unicast form. Use the **no ip helper-address** to remove the forwarding destination server.
Examples	The following is an example of configuring the destination server where the UDP broadcast message will be forwarded to. `DES-7200(config-if)# ip helper-address 192.168.100.1`

Related commands

Command	Description
ip forward-protocol	Configure the specified UDP port to enable forwarding.

7.1.3 udp-helper enable

Use this command to enable the forwarding function of the UDP broadcast message. The **no udp-helper enable** command is used to disable the forward function of the UDP broadcast message.

By default, the forwarding of the UDP broadcast message is disabled.

udp-helper enable

no udp-helper enable

Parameter description	N/A.
Default configuration	Disabled.
Command mode	Global configuration mode.

Usage guidelines

Enable the forwarding function of UDP-Helper. The UDP broadcast messages from the port 69,53,37,137,138,49 are forwarded by default.

Examples

The following is an example of enabling the UDP forwarding function.

```
DES-7200(config)# udp-helper enable
```

Related commands

Command	Description
Ip forward-protocol	Configure the UDP port to enable the forwarding funciton.

8 DHCPv6 Server Configuration Commands

8.1 Configuration Related Commands

8.1.1 clear ipv6 dhcp binding

Use this command to clear the DHCPv6 binding information.

clear ipv6 dhcp binding [*ipv6-address*]

Parameter description

Parameter	Description
ipv6-address	Set the IPv6 address or the prefix.

Default Settings

N/A

Command mode

Privileged EXEC mode.

Usage guidelines

If the *ipv6-address* is not specified, all DHCPv6 binding information are cleared. If the *ipv6-address* is specified, the binding information for the specified address is cleared.

Examples

The following example shows how to clear the DHCPv6 binding information:

```
DES-7200(config)# clear ipv6 dhcp binding
```

Platform description

N/A

8.1.2 clear ipv6 dhcp server statistics

Use this command to clear the DHCPv6 server statistics.

clear ipv6 dhcp server statistics

Parameter description

Parameter	Description
-	-

Default Settings

N/A

Command mode

Privileged EXEC mode.

Usage guidelines

This command is used to clear the DHCPv6 server statistics.

Examples

The following example shows how to clear the DHCPv6 server statistics:

```
DES-7200(config)# clear ipv6 dhcp server statistics
```

Platform description

N/A

8.1.3 dns-server

Use this command to set the DNS Server list information for the DHCPv6 Server. Use the **no** form of this command to remove the configuration.

dns-server *ipv6-address*

no dns-server *ipv6-address*

Parameter description

Parameter	Description
ipv6-address	Set the IPv6 address or the DNS server.

Default Settings

By default, no DNS server list is configured.

Command mode	DHCPv6 pool configuration mode.
Usage guidelines	To configure several DNS Server addresses, use the **dns-server** command for several times. The newly-configured DNS Server address will not overwrite the former ones.
Examples	`DES-7200(config-dhcp)# dns-server 2008:1::1`

Related commands

Command	Description
domain-name	Set the DHCPv6 domain name information.
ipv6 dhcp pool	Set a DHCPv6 pool.

Platform description	N/A

8.1.4 domain-name

Use this command to set the domain name for the DHCPv6 server. Use the **no** form of this command to remove the domain name.

domain-name *domain*

no domain-name *domain*

Parameter description

Parameter	Description
domain	Set the domain name.

Default Settings	By default, no domain name is configured.
Command mode	DHCPv6 pool configuration mode.
Usage	To configure several domain names, use the

guidelines	**domain-name** command for several times. The newly-configured domain name will not overwrite the former ones.

Examples

```
DES-7200(config-dhcp)# domain-name example.com
```

Related commands

Command	Description
dns-server	Set the DHCPv6 DNS server list.
ipv6 dhcp pool	Set the DHCPv6 pool.

Platform description	N/A

8.1.5 iana-address prefix

Use this command to set the IA_NA address prefix for the DHCPv6 Server. Use the **no** form of this command to remove the IA_NA address prefix.

iana-address prefix *ipv6-prefix/prefix-length* [**lifetime** {*valid-lifetime* | *preferred-lifetime*}]

no iana-address prefix

Parameter description

Parameter	Description
ipv6-prefix/prefix-length	Set the IPv6 prefix and prefix length.
lifetime	Set the lifetime of the address allocated to the client. With the keyword **lifetime** configured, both parameters *valid-lifetime* amd *preferred-lifetime* shall be configured.
valid-lifetime	Set the valid lifetime of using the allocated address for the client.
preferred-lifetime	Set the preferred lifetime of the address allocated to the client.

Default Settings	By default, no IA_NA address prefix is configured; The default *valid-lifetime* is 3600s(1 hour). The default *preferred-lifetime is* 3600s(1 hour).
Command mode	DHCPv6 pool configuration mode.
Usage guidelines	This command is used to set the IA_NA address prefix for the DHCPv6 Server, and allocate the IA_NA address to the client. The Server attempts to allocate a usable address within the IA_NA address prefix range to the client upon receiving the IA_NA address request from the client. That address will be allocated to other clients if the client no longer uses that address again.
Examples	`DES-7200(config-dhcp)# iana-address prefix 2008:50::/64 lifetime 2000 1000DES-7200(config-if)# ip verify urpf drop-rate notify`

Related commands

Command	Description
ipv6 dhcp pool	Set the DHCPv6 pool.
show ipv6 dhcp pool	Show the DHCPv6 pool information.

Platform description	N/A

8.1.6 ipv6 dhcp server

Use this command to enable the DHCPv6 server on the interface. Use the **no** form of this command to disable this function.

ipv6 dhcp server *poolname* [**rapid-commit**] [**preference** *value*]

no ipv6 dhcp server

Parameter description

Parameter	Description
poolname	Define the DHCPv6 pool name.

rapid-commit	Allow to use the two-message interaction process.
preference *value*	Set the preference level for the advertise message. The valid range is 1-100 and the default value is 0.

Default Settings

Disabled

Command mode

Interface configuration mode.

Usage guidelines

Use the **ipv6 dhcp server** command to enable the DHCPv6 service.

Configuring the keyword **rapid-commit** allows the two-message interaction for the server and the client when allocating the address prefix and setting other configurations. With this keyword configured, if the client solicit message includes the **rapid-commit** item, the DHCPv6 Server will send the Reply message immediately.

DHCPv6 Server carries with the **preference** value when sending the advertise message if the **preference** level is not 0.

If the **preference** level is 0, the advertise message will not include this field. If the **preference** value is 255, the client sends the request message to the server to obtain the configurations.

DHCPv6 Client, Server and Relay functions are exclusive, and only one of the functions can be configured on the interface.

Examples

```
DES-7200(config)# interface fastethernet 0/1
DES-7200(config-if)# ipv6 dhcp server pool1
```

Related commands

Command	Description
ipv6 dhcp pool	Set the DHCPv6 pool.
show ipv6 dhcp pool	Show the DHCPv6 pool information.

Platform description	N/A

8.1.7 ipv6 dhcp pool

Use this command to set the DHCPv6 server pool. Use the **no** form of this command to remove the information pool.

ipv6 dhcp pool *poolname*

no ipv6 dhcp pool *poolname*

Parameter description

Parameter	Description
poolname	Define the DHCPv6 pool name.

Default Settings	By default, the DHCPv6 server information pool is not configured.
Command mode	Global configuration mode.

Usage guidelines

This command is used to create a DHCPv6 Server configuration pool. After configuring this command, it enters the DHCPv6 pool configuration mode, in which the administrator can set the pool parameters, such as the prefix and the DNS Server information, ect.

After creating the DHCPv6 Server configuration pool, use the **ipv6 dhcp server** command to associate the pool and the DHCPv6 Server on one interface.

Examples

```
DES-7200# configure terminal
DES-7200(config)# ipv6 dhcp pool pool1
DES-7200(config-dhcp)#
```

Related commands

Command	Description
ipv6 dhcp server	Enable the DHCPv6 server function on the interface.
show ipv6 dhcp pool	Show the DHCPv6 pool information.

Platform description	N/A

8.1.8 prefix-delegation

Use this command to set the static binding address prefix information for the DHCPv6 server. Use the **no** form of this command to delete the address prefix information.

prefix-delegation *ipv6-prefix/prefix-length client-DUID* [*lifetime*]

no prefix-delegation *ipv6-prefix/prefix-length client-DUID* [*lifetime*]

Parameter description

Parameter	Description
ipv6-prefix/prefix-length	Set the IPv6 address prefix and the prefix length.
client-DUID	Set the client DUID.
lifetime	Set the interval of using the prefix by the client.

Default Settings

By default, no address prefix information is configured.

Command mode

DHCPv6 pool configuration mode.

Usage guidelines

The administrator uses this command to manually set the address prefix information list for the client IA_PD and set the valid lifetime for those prefixes.

The parameter *client-DUID* allocates the address prefix to the first IA_PD in the specified client.

Before receiving the request message for the address prefix from the client, DHCPv6 Server searches for the corresponding static binding first. If it succeeds, the server returns to the static binding; otherwise, the server will attempt to allocate the address prefix from other prefix information sources.

Examples

```
DES-7200(config-dhcp)# prefix-delegation 2008:2::/64
0003000100d0f82233ac
```

Related commands

Command	Description
ipv6 dhcp pool	Set a DHCPv6 pool.
ipv6 local pool	Set a local prefix pool.
prefix-delegation pool	Specify the DHCPv6 local prefix pool.
show ipv6 dhcp pool	Show the DHCPv6 pool information.

Platform description

N/A

8.1.9 prefix-delegation pool

Use this command to specify the local prefix pool for the DHCPv6 server. Use the **no** form of this command to remove the local prefix pool.

prefix-delegation pool *poolname* [**lifetime** {*valid-lifetime* | *preferred-lifetime*}]

no prefix-delegation pool *poolname*

Parameter description

Parameter	Description
poolname	Set the local prefix pool name.
lifetime	Set the lifetime of the address prefix allocated to the client. With the keyword **lifetime** configured, both parameters *valid-lifetime* amd *preferred-lifetime* shall be configured.
valid-lifetime	Set the valid lifetime of using the allocated address prefix for the client.
preferred-lifetime	Set the preferred lifetime of the address prefix allocated to the client.

Default Settings

By default, no address prefix pool is specified.

The default *valid-lifetime* is 3600s(1 hour).

The default *preferred-lifetime is* 3600s(1 hour).

Command mode	DHCPv6 pool configuration mode.
Usage guidelines	Use the **prefix-delegation pool** command to set the prefix pool for the DHCPv6 Server and allocate the prefix to the client. Use the **ipv6 local pool** command to set the prefix pool. The Server attempts to allocate a usable prefix from the prefix pool to the client upon receiving the prefix request from the client. That prefix will be allocated to other clients if the client no longer uses that prefix again.
Examples	`DES-7200(config-dhcp)# prefix-delegation pool client-prefix-pool lifetime 2000 1000`

Related commands

Command	Description
ipv6 dhcp pool	Set a DHCPv6 pool.
ipv6 local pool	Set a local prefix pool.
prefix-delegation	Staticlly bind the client with the address prefix.
show ipv6 dhcp pool	Show the DHCPv6 pool information.

Platform description	N/A

8.2 Showing Related Commands

8.2.1 show ipv6 dhcp

Use this command to show the device DUID.

show ipv6 dhcp

Parameter description

Parameter	Description
-	-

Default Settings	N/A
Command mode	Privileged EXEC mode.
Usage guidelines	The server, client and relay on the same device share a DUID.
Examples	`DES-7200# show ipv6 dhcp` `This device's DHCPv6 unique identifier(DUID): 00:03:00:01:00:d0:f8:22:33:b0`
Platform description	N/A

8.2.2 show ipv6 dhcp binding

Use this command to show the address binding information for the DHCPv6 server.

show ipv6 dhcp binding [*ipv6-address*]

Parameter description

Parameter	Description
ipv6-address	Set the IPv6 address or the prefix.

Default Settings	N/A
Command mode	Privileged EXEC mode.
Usage guidelines	If the *ipv6-address* is not specified, all prefixes dynamically assigned to the client and IANA address binidng information are shown. If the *ipv6-address* is specified, the binding information for the specified address is shown.
Examples	`DES-7200# show ipv6 dhcp binding` `Client DUID: 00:03:00:01:00:d0:f8:22:33:ac`

```
IAPD: iaid 0, T1 1800, T2 2880
  Prefix: 2001:20::/72
         preferred lifetime 3600, valid lifetime 3600
      expires at Jan 1 2008 2:23 (3600 seconds)
```

Platform description N/A

8.2.3 show ipv6 dhcp interface

Use this command to show the DHCPv6 interface information.

show ipv6 dhcp interface *[interface-name]*

Parameter description

Parameter	Description
interface-name	Set the interface name.

Default Settings N/A

Command mode Privileged EXEC mode.

Usage guidelines If the *interface-name* is not specified, all DHCPv6 interface information are shown. If the *interface-name* is specified, the specified interface information is shown.

Examples

```
DES-7200# show ipv6 dhcp interface
VLAN 1 is in server mode
  Server pool dhcp-pool
  Rapid-Commit: disable
```

Platform description N/A

8.2.4 show ipv6 dhcp pool

Use this command to show the DHCPv6 pool information

show ipv6 dhcp pool *[poolname]*

Parameter description

Parameter	Description
poolname	Define the DHCPv6 pool name.

Default Settings	N/A
Command mode	Privileged EXEC mode.
Usage guidelines	If the *poolname* is not specified, all DHCPv6 interface information are shown. If the *poolname* is specified, the specified interface information is shown.
Examples	DES-7200# **show ipv6 dhcp pool** DHCPv6 pool: dhcp-pool DNS server: 2011:1::1 DNS server: 2011:1::2 Domain name: example.com
Platform description	N/A

8.2.5 show ipv6 dhcp server statistics

Use this command to show the DHCPv6 server statistics.

show ipv6 dhcp server statistics

Parameter description	Parameter	Description
	-	-

Default Settings	N/A
Command mode	Privileged EXEC mode.
Usage guidelines	This command is used to show the DHCPv6 server statistics.
Examples	DES-7200# **show ipv6 dhcp server statistics** DHCPv6 server statistics:

```
Packet statistics:

DHCPv6 packets received:          7

Solicit received:                 7

Request received:                 0

Confirm received:                 0

Renew received:                   0

Rebind received:                  0

Release received:                 0

Decline received:                 0

Relay-forward received:           0

Information-request received:     0

Unknown message type received:    0

Error message received:           0


DHCPv6 packet sent:               0

Advertise sent:                   0

Reply sent:                       0

Relay-reply sent:                 0

Send reply error:                 0

Send packet error:                0


Binding statistics:

Bindings generated:               0

IAPD assigned:                    0

IANA assigned:                    0


Configuration statistics:

DHCPv6 server interface:          1
```

```
DHCPv6 pool:                    0

DHCPv6 iapd binding:             0
```

Related commands

Command	Description
ipv6 dhcp pool	Set a DHCPv6 pool.

Platform description

N/A

9 DHCPv6 Client Configuration Commands

9.1 Configuration Related Command

9.1.1 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 disable the prefix address request.

ipv6 dhcp client pd ***prefix-name*** [rapid-commit]

no ipv6 dhcp client pd

Parameter description

Parameter	Description
prefix-name	Define the IPv6 prefix name.
rapid-commit	Allow the simplified interaction process.

Default Disabled

Command mode Interface configuration mode.

Usage guidelines

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.

Examples The following example shows how to enable the prefix information request on the interface:

	DES-7200(config)# **interface fastethernet** *0/1* DES-7200(config-if)# **ipv6 dhcp client pd** *pd_name*

Related commands

Command	Description
clear ipv6 dhcp client	Reset the DHCPv6 client function on the interface.
show ipv6 dhcp interface	Show the DHCPv6 interface configuration.

9.2 Showing Related Commands

9.2.1 show ipv6 dhcp

Use this command to show the device DUID information.

show ipv6 dhcp

Parameter description

Parameter	Description
-	-

Default N/A.

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

Usage guidelines One DUID is shared by the server, client and relay on the same device.

Examples

```
DES-7200# show ipv6 dhcp
This device's DHCPv6 unique identifier(DUID):
00:03:00:01:00:d0:f8:22:33:b0
```

9.2.2 show ipv6 dhcp interface

Use this command to show the DHCPv6 interface information.

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

Parameter description

Parameter	Description
interface-type interface-number	Set the interface type and the interface number.

Default	N/A.
Command mode	Privileged EXEC mode / Global / Interface configuration mode.
Usage guidelines	If the *interface-type interface-number* is not defined, show the information of all DHCPv6 interfaces. If the *interface-type interface-number* is defined, show the information of this interface.

Examples	`DES-7200# show ipv6 dhcp interface`
	`VLAN 1 is in server mode`
	`  Server pool dhcp-pool`
	`  Rapid-Commit: disable`

9.2.3 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	Set the interface type and the interface number.

Default	N/A.
Command mode	Privileged EXEC mode.
Usage guidelines	This command is used to reset the DHCPv6 client, which may lead the client to request for the configurations from the server again.
Examples	`DES-7200# clear ipv6 dhcp client vlan 1`

10 DHCPv6 Relay Agent Configuration Commands

10.1 Configuration Related Command

10.1.1 ipv6 dhcp relay destination

Use this command to enable the DHCPv6 Relay Agent function and specify the destination address and the destination interface. Use the **no** form of this command to disable this function or remove the destination address.

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	Specify the Relay Agent destination address.
interface-type	(Optional) Specify the destination interface type.
interface-number	(Optional) Specify the destination interface number.

Default N/A.

Command mode Interface configuration mode.

Usage guidelines	With the DHCPv6 Relay function enabled on the interface, all DHCPv6 client messages will be encapsulated and forwarded to the specified interface and the configured destination addresses. **Caution** ✧ The **dhcpv6 relay destination** command can only be enabled on the layer-3 interface. ✧ There can be up to 20 Relay Agent Destinations on one device. ✧ The interface number must be defined if the destination address is the multicast address.

Examples	The following example shows how to enable DHCPv6 Relay service on the interface VLAN1 and specify the destination address 3001::2:
	`DES-7200#configure terminal`
	`Enter configuration commands, one per line. End with CNTL/Z.`
	`DES-7200(config)#interface vlan 1`
	`DES-7200(config-if)#ipv6 dhcp relay destination 3001::2`
	`DES-7200(config-if)#end`

Related commands	**Command**: **show ipv6 dhcp relay destination** { **all** | **interface** *interface-type interface-number* } **Description**: Show the current Relay destination address list.
Platform description	N/A

10.2 Showing Related Commands

10.2.1 show ipv6 dhcp relay destination

Use this command to show the DHCPv6 Relay Agent destination address and interface information.

show ipv6 dhcp relay destination

Parameter description

Parameter	Description
all	Show all destination address and interface information.
interface *interface-type interface-number*	Show the specified destination address and interface information.

Default N/A.

Command mode Privileged EXEC mode

Usage guidelines N/A

Examples The following example shows all current Relay destination address configurations:

```
DES-7200# show ipv6 dhcp relay destination all
Interface: Vlan1
Destination address(es)      Output Interface
3001::2
FF02::1:2                              Vlan2
```

Platform description N/A

10.2.2 show ipv6 dhcp relay statistics

Use this command to show the packet sending and receiving condition with the DHCPv6 Relay function enabled.

show ipv6 dhcp relay statistics

Parameter description

Parameter	Description
-	-

Default N/A.

Command mode	Privileged EXEC mode.
Usage guidelines	N/A

Examples

```
DES-7200# 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	Clear the statistical information.

Platform description	N/A

10.2.3 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
-	-

Default N/A.

Command mode Privileged EXEC mode.

Usage guidelines N/A

Examples

```
DES-7200# clear ipv6 dhcp relay statistics
```

Related commands

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

Platform description N/A

11 DNS Module Configuration Commands

11.1 Configuring Related Commands

11.1.1 ip domain-lookup

Use this command to enable the DNS to carry out the 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

Default configuration	Enabled.
Command mode	Global configuration mode.
Usage guidelines	This command enables the domain name resolution function.
Examples	The following example enables the DNS domain name resolution function. `DES-7200(config)# ip domain-lookup`

Related commands

Command	Description
show hosts	Show the DNS related configuration information.

11.1.2 ip host

Use this command to configure the mapping of the host name and the IP address by manual. 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

Command mode

Global configuration mode.

Usage guidelines

To delete the host list, use the **no ip host** *host-name ip-address* command.

Examples

```
DES-7200(config)# ip host switch 192.168.5.243
```

Related commands

Command	Description
show hosts	Show the DNS related configuration information.

11.1.3 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.

Default configuration

N/A.

Command mode	Global configuration mode.
Usage guidelines	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.

Examples	`DES-7200(config)# ip name-server 192.168.5.134`
	`DES-7200(config)# ip name-server`
	`2001:0DB8::250:8bff:fee8:f800 2001:0DB8:0:f004::1`

Related commands

Command	Description
show hosts	Show the DNS related configuration information.

11.1.4 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

Command mode	Global configuration mode.
Usage guidelines	To delete the host list, use the **no ipv6 host** *host-name ipv6-address* command.
Examples	`DES-7200(config)# ipv6 host switch` `2001:0DB8:700:20:1::12`

Related commands

Command	Description
show hosts	Show the DNS related configuration information.

11.2 Show Related Commands

11.2.1 clear host

Use this command to clear the dynamically learned host name in the privileged user mode.

clear host [*host-name*]

Parameter description

Parameter	Description
host-name	Delete the dynamically learned host. "*" denotes to clear all the dynamically learned host names.

Command mode

Privileged mode.

Usage guidelines

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.

Examples

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

```
clear host *
```

Related commands

Command	Description
show hosts	Show the host name buffer table.

11.2.2 show hosts

Use this command to display DNS configuration.

show hosts [*hostname*]

Command mode

Privileged mode.

Usage guidelines

Show the DNS related configuration information.

Examples

```
DES-7200# show hosts
Name servers are:
192.168.5.134 static

Host                          type               Address
TTL(sec)
switch           static      192.168.5.243          ---
www.DES-7200.com      dynamic            192.168.5.123
126
```

Related commands

Command	Description
ip host	Configure the host name and IP address mapping by manual.
ipv6 host	Configure teh host name and IPv6 address mapping by manual.
ip name-server	Configure the DNS server.

12 FTP Server Configuration Commands

12.1 Configuration Related Commands

12.1.1 debug ftp server

Use this command to enable outputting the debugging messages in the FTP server. Use the **no** form of this command to disable this function.

debug ftpserver

no debug ftpserver

Parameter description

Parameter	Description
-	-

Default Settings

Disabled

Command mode

Privileged user mode.

Usage guidelines

Use this command to display the detailed debugging information during FTP server operation.

Examples

The following example shows how to enable outputting the debugging messages in the FTP Server:

```
DES-7200# debug ftpserver
FTPSRV_DEBUG:(RECV)   SYST
FTPSRV_DEBUG:(REPLY)  215 DNOS Type: L8
FTPSRV_DEBUG:(RECV)   PORT 192,167,201,82,7,120
FTPSRV_DEBUG:(REPLY)  200 PORT Command okay.
```

The following example shows how to disable outputting the debugging messages in the FTP Server:

```
DES-7200# no debug ftpserver
```

Platform description N/A

12.1.2 ftp-server enable

Use this command to enable the FTP server. Use the **no** form of this command to disable the FTP server.

ftp-server enable

no ftp-server enable

Parameter description

Parameter	Description
-	-

Default Settings Disabled

Command mode Global configuration mode.

Usage guidelines

This command is used to enable the FTP server to connect the FTP client to upload/download the files.

Caution

To enable the FTP client to access to the FTP server files, this command shall be co-used with the **ftp-server topdir** command.

Examples

The following example shows how to enable the FTP Server and make the FTP client access to the syslog content only:

```
DES-7200(config)# ftp-server topdir /syslog
DES-7200(config)# ftp-server enable
```

The following example shows how to disable the FTP Server:

```
DES-7200(config)# no ftp-server enable
```

12.1.3 ftp-server password

Use this command to set the login password for the FTP server. Use the **no** form of this command to cancel the password configuration.

ftp-server password [*type*] *password*

no ftp-server password

Parameter description

Parameter	Description
type	Define the encryption type of the password: 0 or 7. The default type is 0. 0 indicates the password is not encrypted. 7 indicates the password is encrypted.
password	The login password for the FTP server.

Default Settings

By default, there is no password.

Command mode

Global configuration mode.

Usage guidelines

For the FTP server, the login username and the login password must be configured to verify the client connection. One password can be set at most.

The password must include the letter or number. The space in front of / behind the password is allowed, but it is ignored. While the space in the middle of the password is a part of password.

The minimum and maximum lengths of the plain-text password are 1 character and 25 characters.

The minimum and maximum lengths of the encrypted password are 4 characters and 52 characters respectively.

The encrypted password is generated by plain-text password encryption and its format must comply with the encryption specification. If the encrypted password is used for the setting, the client must use the corresponding plain-text password for the purpose of successful login.

Caution

Null password is not supported by the FTP server. Without the password configuration, the client fails to pass the identity verification of the server.

Examples

The following example shows how to set the plain-text password as *pass*:

```
DES-7200(config)# ftp-server password pass
OR:
DES-7200(config)# ftp-server password 0 pass
```

The following example shows how to set the cipher-text password as *8001*:

```
DES-7200(config)# ftp-server password 7 8001
```

The following example shows how to delete the password configuration:

```
DES-7200(config)# no ftp-server password
```

Platform description N/A

12.1.4 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 prevent the FTP client from accessing to the FTP server files.

ftp-server topdir *directory*

no ftp-server topdir

Parameter description

Parameter	Description
directory	Set the top-directory.

Default Settings By default, no top-directory is configured.

Command mode Global configuration mode.

Usage The FTP server top directory specifies the directory range

guidelines	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.

Examples	The following example shows how to enable the FTP Server and make the FTP client access to the syslog content only:
	`DES-7200(config)# ftp-server topdir /syslog`
	`DES-7200(config)# ftp-server enable`
	
	The following example shows how to remove the top-directory configuration:
	`DES-7200(config)# no ftp-server topdir`

Platform description	N/A

12.1.5 ftp-server timeout

Use this command to set the FTP session idle timeout. Use the **no** form of this command to restore the idle timeout to the default value（30 minutes）.

ftp-server timeout *time*

no ftp-server timeout

Parameter description

Parameter	Description
time	Set the session idle timeout, in minutes. The valid range is 1-3600.

Default Settings	Default time is 30 minutes.
Command mode	Global configuration mode.
Usage guidelines	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. **Caution**

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

Examples	The following example shows how to set the session idle timeout as 5m:
	`DES-7200(config)# ftp-server timeout 5`
	The following example shows how to restore the session idle timeout to the default value(30m):
	`DES-7200(config)# no ftp-server timeout`

Platform description	N/A

12.1.6 ftp-server username

Use this command to set the login username for the FTP server. Use the **no** form of this command to cancel the username configuration.

ftp-server username *username*

no ftp-server username

Parameter description

Parameter	Description
username	Set the login username.

Default Settings	By default, no username is set.
Command mode	Global configuration mode.
Usage guidelines	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. **Caution** The anonymous user login is not supported on the FTP

server. The client fails to pass the identity verification if the username is removed.

Examples

The following example shows how to set the username as *user*:

```
DES-7200(config)# ftp-server username user
```

The following example shows how to remove the username configuration:

```
DES-7200(config)# no ftp-server username
```

Platform description N/A

12.2 Showing Related Commands

12.2.1 show ftp-server

Use this command to show the status information of the FTP server.

show ftp-server

Parameter description

Parameter	Description
-	-

Default Settings N/A.

Command mode Privileged EXEC mode.

Usage guidelines

The FTP server status information includes:

- Enabled/Disabled server
- The control connection is set up or not (the related IP, Port are shown)
- The data connection is set up or not (the related IP, Port and the working mode are shown)
- The current file transmission type
- The login username and password
- The FTP server top directory
- The session idle timeout setting

Examples

The following example shows the related status information of the FTP server:

```
DES-7200# show ftp-server
ftp-server information
=====================================
enable : Y
topdir : /
timeout: 20min
username config : Y
password config : Y
type: BINARY
control connect : Y
ftp-server: ip=192.167.201.245  port=21
ftp-client: ip=192.167.201.82  port=4978
port data connect : Y
ftp-server: ip=192.167.201.245  port=22
ftp-client: ip=192.167.201.82  port=4982
passive data connect : N
```

Platform description N/A

13 TCP Configuration Commands

13.1 Configuration Related Commands

13.1.1 ip tcp path-mtu-discovery

Use this command to enable PMTU(Path Maximum Transmission Unit) discovery function for TCP in the global configuration mode. Use the **no** form of this command to disable this function.

ip tcp path-mtu-discovery [**age-timer** {*minutes* **| infinite**}]
no ip tcp path-mtu-discovery [**age-timer** {*minutes* **| infinite**}]

Parameter description

Parameter	Description
age-timer *minutes*	(Optional) Set the interval for the re-detection after the TCP discovers PMTU, in minutes. The default time is 10m. The valid range is 10-30m.
age-timer infinite	(Optional) No re-detection after the TCP discovers the PTMU.

Default Settings

Disabled

Command mode

Global configuration mode.

Usage guidelines

Based on the 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 the existent TCP connection and is only effective for the TCP

connection to be created. This command is valid for both the IPv4 and IPv6 TCP.

According to the RFC1191, after discovering the PMTU, the TCP uses greater MSS to detect the new PMTU at some interval, which is specified by the parameter **age-timer**. If the PMTU discovered is smaller than the MSS negotiated between both 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 using this timer. Use the parameter **age-timer infinite** to stop this timer.

Examples

The following example shows how to enable the TCP PMTU discovery function:

```
DES-7200(config)# ip tcp path-mtu-discovery
```

Related commands

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

13.2 Showing Related Commands

13.2.1 show tcp pmtu

Use this command to view the TCP PMTU information.

Parameter description

Parameter	Description
-	-

Default Settings

N/A.

Command mode

Privileged EXEC mode.

Usage guidelines

Use this command to view the PMTU value for the TCP connection.

Examples

```
DES-7200# show tcp pmtu
```

```
No.     Local Address          Foreign Address       PMTU
[1]    2002::1.18946          2002::2.23            1440
[2]  192.168.195.212.23    192.168.195.112.13560  1440
```

The following table is the field description :

Field	Description
No.	Sequence number.
Local Address	The local address and the port number. The number after the last “.” is the port number. For example, “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, “2002::2.23” and “192.168.195.212.23” , “23” is the port number.
PMTU	The PMTU value.

Related commands

Command	Description
ip tcp path-mtu-discovery	Enable the TCP PMTU discovery function.