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Chapter 1 COMMANDS FOR DHCP

1.1 Commands for DHCP Server Configuration

1.1.1 bootfile

- **Command: bootfile *<filename>***
  - **no bootfile**
- **Function:** Sets the file name for DHCP client to import on boot up; the "**no bootfile**" command deletes this setting.
- **Parameters: *<filename>*** is the name of the file to be imported, up to 255 characters are allowed.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** Specify the name of the file to be imported for the client. This is usually used for diskless workstations that need to download a configuration file from the server on boot up. This command is together with the "next sever".
- **Example:** The path and filename for the file to be imported is "c:\temp\nos.img"
- Switch(dhcp-1-config)#bootfile c:\temp\nos.img
- **Related Command: next-server**

1.1.2 clear ip dhcp binding

- **Command: clear ip dhcp binding {*<address>* | all}**
- **Function:** Deletes the specified IP address-hardware address binding record or all IP address-hardware address binding records.
- **Parameters: *<address>*** is the IP address that has a binding record in decimal format. **all** refers to all IP addresses that have a binding record.
- **Command mode:** Admin Mode.
- **Usage Guide:** "**show ip dhcp binding**" command can be used to view binding information for IP addresses and corresponding DHCP client hardware addresses. If the DHCP server is informed that a DHCP client is not using the assigned IP address for some reason before the lease period expires, the DHCP server would not remove the binding information automatically. The system administrator can use this command to delete that IP address-client hardware address binding manually, if "all" is specified, then all auto binding records will be deleted, thus all addresses in the DHCP address pool will be reallocated.
- **Example:** Removing all IP-hardware address binding records.
- Switch#clear ip dhcp binding all
- **Related Command: show ip dhcp binding**

1.1.3 clear ip dhcp conflict

- **Command: clear ip dhcp conflict {*<address>* | all }**

- **Function:** Deletes an address present in the address conflict log.
- **Parameters:** *<address>* is the IP address that has a conflict record; **all** stands for all addresses that have conflict records.
- **Command mode:** Admin Mode.
- **Usage Guide:** "**show ip dhcp conflict**" command can be used to check which IP addresses are conflicting for use. The **"clear ip dhcp conflict"** command can be used to delete the conflict record for an address. If "all" is specified, then all conflict records in the log will be removed. When records are removed from the log, the addresses are available for allocation by the DHCP server.
- **Example:** The network administrator finds 10.1.128.160 that has a conflict record in the log and is no longer used by anyone, so he deletes the record from the address conflict log.
- Switch#clear ip dhcp conflict 10.1.128.160
- **Related Command: ip dhcp conflict logging, show ip dhcp conflict**

1.1.4 clear ip dhcp server statistics

- **Command: clear ip dhcp server statistics**
- **Function:** Deletes the statistics for DHCP server, clears the DHCP server count.
- **Parameters:** None
- **Command mode:** Admin Mode.
- **Usage Guide:** DHCP count statistics can be viewed with "**show ip dhcp server statistics**" command, all information is accumulated. You can use the "**clear ip dhcp server statistics**" command to clear the count for easier statistics checking.
- **Example:** Clearing the count for DHCP server.
- Switch#clear ip dhcp server statistics
- **Related Command: show ip dhcp server statistics**

1.1.5 client-identifier

- **Command: client-identifier *<unique-identifier>***
    - **no client-identifier**
- **Function:** Specifies the unique ID of the user when binding an address manually; the "**no client-identifier**" command deletes the identifier.
- **Parameters:** *<unique-identifier>* is the user identifier, in dotted Hex format.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** This command is used with "host" when binding an address manually. If the requesting client identifier matches the specified identifier, DHCP server assigns the IP address defined in "host" command to the client.
- **Example:** Specifying the IP address 10.1.128.160 to be bound to user with the unique id of 00-10-5a-60-af-12 in manual address binding.
- Switch(dhcp-1-config)#client-identifier 00-10-5a-60-af-12
- Switch(dhcp-1-config)#host 10.1.128.160 24
- **Related Command: host**

1.1.6 debug ip dhcp client

- **Command: debug ip dhcp client {event | packet}**
  - **no debug ip dhcp server {event | packet}**
- **Function:** Enable the debugging of DHCP client, no command disables the debugging of DHCP client.
- **Command mode:** Admin Mode
- **Default:** Disable the debugging.

1.1.7 debug ip dhcp relay

- **Command: debug ip dhcp server packet**
  - **no debug ip dhcp server packet**
- **Function:** Enable the debugging of DHCP relay, no command disables the debugging of DHCP relay.
- **Command mode:** Admin Mode
- **Default:** Disable the debugging.

1.1.8 debug ip dhcp server

- **Command: debug ip dhcp server { events | linkage | packets }**
  - **no debug ip dhcp server { events | linkage | packets }**
- **Function:** Enables DHCP server debug information: the "**no debug ip dhcp server {events | linkage | packets}**" command disables the debug information for DHCP server**.**
- **Default:** Debug information is disabled by default.
- **Command mode:** Admin Mode.

1.1.9 default-router

- **Command: default-router *<address1>*[*<address2>*[…*<address8>*]]**
  - **no default-router**
- **Function:** Configures default gateway(s) for DHCP clients; the "**no default-router**" command deletes the default gateway.
- **Parameters: *<address1>…<address8>*** are IP addresses, in decimal format.
- **Default:** No default gateway is configured for DHCP clients by default.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** The IP address of default gateway(s) should be in the same subnet as the DHCP client IP, the switch supports up to 8 gateway addresses. The gateway address assigned first has the highest priority, and therefore address1 has the highest priority, and address2 has the second, and so on.
- **Example:** Configuring the default gateway for DHCP clients to be 10.1.128.2 and 10.1.128.100.

Switch(dhcp-1-config)#default-router 10.1.128.2 10.1.128.100

1.1.10 dns-server

- **Command: dns-server *<address1>*[*<address2>*[…*<address8>*]]**
  - **no dns-server**
- **Function:** Configure DNS servers for DHCP clients; the "**no dns-server**" command deletes the default gateway.
- **Parameters: *<address1>…<address8>*** are IP addresses, in decimal format.
- **Default:** No DNS server is configured for DHCP clients by default.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** Up to 8 DNS server addresses can be configured. The DNS server address assigned first has the highest priority, therefore address 1 has the highest priority, and address 2 has the second, and so on.
- **Example:** Set 10.1.128.3 as the DNS server address for DHCP clients.
- Switch(dhcp-1-config)#dns-server 10.1.128.3

1.1.11 domain-name

- **Command: domain-name *<domain>***
  - **no domain-name**
- **Function:** Configures the Domain name for DHCP clients; the "**no domain-name**" command deletes the domain name.
- **Parameters: *<domain>*** is the domain name, up to 255 characters are allowed.
- **Command Mode:** DHCP Address Pool Mode
- **Default:** None
- **Usage Guide:** Specifies a domain name for the client.
- **Example:** Specifying "qtech.ru" as the DHCP clients' domain name.
- Switch(dhcp-1-config)#domain-name qtech.ru

1.1.12 hardware-address

- **Command: hardware-address *<hardware-address>* [{Ethernet | IEEE802|*<type-number>*}]**
  - **no hardware-address**
- **Function:** Specifies the hardware address of the user when binding address manually; the "**no hardware-address**" command deletes the setting.
- **Parameters: *<hardware-address>*** is the hardware address in Hex; **Ethernet | IEEE802** is the Ethernet protocol type, *<type-number>* should be the RFC number defined for protocol types, from 1 to 255, e.g., 0 for Ethernet and 6 for IEEE 802.
- **Default:** The default protocol type is Ethernet,
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** This command is used with the "host" when binding address manually. If the requesting client hardware address matches the specified hardware address, the DHCP server assigns the IP address defined in "host" command to the client.

- **Example:** Specify IP address 10.1.128.160 to be bound to the user with hardware address 00-00-e2-3a-26-04 in manual address binding.
- Switch(dhcp-1-config)#hardware-address 00-00-e2-3a-26-04
- Switch(dhcp-1-config)#host 10.1.128.160 24
- **Related Command: host**

1.1.13 host

- **Command: host <*address*> [<*mask*> | <*prefix-length*>]**
    - **no host**
- **Function:** Specifies the IP address to be assigned to the user when binding addresses manually; the "**no host**" command deletes the IP address.
- **Parameters: <*address*>** is the IP address in decimal format; **<*mask*>** is the subnet mask in decimal format; **<*prefix-length*>** means mask is indicated by prefix. For example, mask 255.255.255.0 in prefix is "24", and mask 255.255.255.252 in prefix is "30".
- **Command Mode:** DHCP Address Pool Mode
- **Default:** None
- **Usage Guide:** If no mask or prefix is configured when configuring the IP address, and no information in the IP address pool indicates anything about the mask, the system will assign a mask automatically according to the IP address class.
- This command is used with "hardware address" command or "client identifier" command when binding addresses manually. If the identifier or hardware address of the requesting client matches the specified identifier or hardware address, the DHCP server assigns the IP address defined in "host" command to the client.
- **Example:** Specifying IP address 10.1.128.160 to be bound to user with hardware address 00-10-5a-60-af-12 in manual address binding.
- Switch(dhcp-1-config)#hardware-address 00-10-5a-60-af-12
- Switch(dhcp-1-config)#host 10.1.128.160 24
- **Related command: hardware-address, client-identifier**

1.1.14 ip dhcp conflict logging

- **Command: ip dhcp conflict logging**
    - **no ip dhcp conflict logging**
- **Function:** Enables logging for address conflicts detected by the DHCP server; the "**no ip dhcp conflict logging**" command disables the logging.
- **Default:** Logging for address conflict is enabled by default.
- **Command mode:** Global Mode
- **Usage Guide:** When logging is enabled, once the address conflict is detected by the DHCP server, the conflicting address will be logged. Addresses present in the log for conflicts will not be assigned dynamically by the DHCP server until the conflicting records are deleted.
- **Example:** Disable logging for DHCP server.
- Switch(config)#no ip dhcp conflict logging

- **Related Command: clear ip dhcp conflict**

1.1.15 ip dhcp disable

- This command is not supported by the switch.

1.1.16 ip dhcp excluded-address

- **Command: ip dhcp excluded-address *<low-address>* [*<high-address>*]**
- **no ip dhcp excluded-address *<low-address>* [*<high-address>*]**
- **Function:** Specifies addresses excluding from dynamic assignment; the "**no ip dhcp excluded-address *<low-address>* [*<high-address>*]**" command cancels the setting.
- **Parameters: *<low-address>*** is the starting IP address, **[*<high-address>*]** is the ending IP address.
- **Default:** Only individual address is excluded by default.
- **Command mode:** Global Mode
- **Usage Guide:** This command can be used to exclude one or several consecutive addresses in the pool from being assigned dynamically so that those addresses can be used by the administrator for other purposes.
- **Example:** Reserving addresses from 10.1.128.1 to 10.1.128.10 from dynamic assignment.
- Switch(config)#ip dhcp excluded-address 10.1.128.1 10.1.128.10

1.1.17 ip dhcp pool

- **Command: ip dhcp pool *<name>***
    - **no ip dhcp pool *<name>***
- **Function:** Configures a DHCP address pool and enter the pool mode; the "**no ip dhcp pool *<name>***" command deletes the specified address pool.
- **Parameters: *<name>*** is the address pool name, up to 32 characters are allowed.
- **Command mode:** Global Mode
- **Usage Guide:** This command is used to configure a DHCP address pool under Global Mode and enter the DHCP address configuration mode.
- **Example:** Defining an address pool named "1".
- Switch(config)#ip dhcp pool 1
- Switch(dhcp-1-config)#

1.1.18 ip dhcp conflict ping-detection enable

- **Command: ip dhcp conflict ping-detection enable**
- **no ip dhcp conflict ping-detection enable**
- **Function:** Enable Ping-detection of conflict on DHCP server; the no operation of this command will disable the function.
- **Parameters:** None.
- **Default Settings:** By default, Ping-detection of conflict is disabled.

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- **Command Mode:** Global Configuration Mode.
- **Usage Guide:** To enable Ping-detection of conflict, one should enable the log of conflict addresses, when which is disabled, so will the ping-detection of conflict. When a client is unable to receive Ping request messages (when blocked by firewall, for example), this function will check local ARP according to allocated IP: if a designated IP has a corresponding ARP, then an address conflict exists; otherwise, allocate it to the client.
- **Examples:** Enable Ping-detection of conflict.
- Switch(config)#ip dhcp conflict ping-detection enable
- **Related Command: ip dhcp conflict logging, ip dhcp ping packets, ip dhcp ping timeout**

1.1.19 ip dhcp ping packets

- **Command: ip dhcp ping packets *<request-num>***
- **no ip dhcp ping packets**
- **Function:** Set the max number of Ping request (Echo Request) message to be sent in Ping-detection of conflict on DHCP server, whose default value is 2; the no operation of this command will restore the default value.
- **Parameters: *<request-num>*** is the number of Ping request message to be sent in Ping-detection of conflict.
- **Default Settings:** No more than 2 Ping request messages will be sent by default.
- **Command Mode:** Global Configuration Mode.
- **Examples:** Set the max number of Ping request (Echo Request) message to be sent in Ping-detection of conflict on DHCP server as 3.
- Switch(config)#ip dhcp ping packets 3
- **Related Command: ip dhcp conflict ping-detection enable, ip dhcp ping timeout**

1.1.20 ip dhcp ping timeout

- **Command: ip dhcp ping timeout *<timeout-value>***
- **no ip dhcp ping timeout**
- **Function:** Set the timeout period (in ms) of waiting for a reply message (Echo Request) after each Ping request message (Echo Request) in Ping-detection of conflict on DHCP server, whose default value is 500ms. The no operation of this command will restore the default value.
- **Parameters: *<timeout-value>*** is the timeout period of waiting for a reply message after each Ping request message in Ping-detection of conflict.
- **Default Settings:** The timeout period is 500ms by default.
- **Command Mode:** Global Configuration Mode.
- **Examples:** Set the timeout period (in ms) of waiting for each reply message (Echo Request) in Ping-detection of conflict on DHCP server as 600ms.
- Switch(config)# ip dhcp ping time out 600
- **Related Command: ip dhcp conflict ping-detection enable, ip dhcp ping packets**

1.1.21 lease

- **Command: lease { [*<days>*] [*<hours>*][*<minutes>*] | infinite }**
  - **no lease**
- **Function:** Sets the lease time for addresses in the address pool; the "**no lease**" command restores the default setting.
- **Parameters:** *<days>* is number of days from 0 to 365; *<hours>* is number of hours from 0 to 23; *<minutes>* is number of minutes from 0 to 59; **infinite** means perpetual use.
- **Default:** The default lease duration is 1 day.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** DHCP is the protocol to assign network addresses dynamically instead of permanently, hence the introduction of ease duration. Lease settings should be decided based on network conditions: too long lease duration offsets the flexibility of DHCP, while too short duration results in increased network traffic and overhead. The default lease duration of switch is 1 day.
- **Example:** Setting the lease of DHCP pool "1" to 3 days 12 hours and 30 minutes.
- Switch(dhcp-1-config)#lease 3 12 30

1.1.22 max-lease-time

- **Command: max-lease-time {[*<days>*] [*<hours>*] [*<minutes>*] | infinite}**
  - **no max-lease-time**
- **Function:** Set the maximum lease time for the addresses in the address pool; the no command restores the default setting.
- **Parameters:** *<days>* is number of days from 0 to 365; *<hours>* is number of hours from 0 to 23; *<minutes>* is number of minutes from 0 to 59; **infinite** means perpetual use.
- **Default:** The default lease time is 1 day.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** This command is used to DHCP request packets with option51. If the lease time (user requests the address) exceeds the maximum lease time configured, the lease that DHCP server assigns the address is the maximum lease time configured. If the lease time requested by the user is less than the maximum lease time configured, the lease that DHCP server assigns the address is the lease time requested by the user. The maximum lease time is able to be set by the administrator according to the actual network condition, and the maximum lease time is 1 day by default.
- **Example:** Set the maximum lease time of DHCP address pool1 to 3 days 12 hours and 30 minutes.
- Switch(dhcp-1-config)#max-lease-time 3 12 30

1.1.23 netbios-name-server

- **Command: netbios-name-server *<address1>*[*<address2>*[...*<address8>*]]**
  - **no netbios-name-server**

- **Function:** Configures WINS servers' address; the "**no netbios-name-server**" command deletes the WINS server.
- **Parameters:** *<address1>…<address8>* are IP addresses, in decimal format.
- **Default:** No WINS server is configured by default.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** This command is used to specify WINS server for the client, up to 8 WINS server addresses can be configured. The WINS server address assigned first has the highest priority. Therefore, address 1 has the highest priority, and address 2 the second, and so on.
- **Example:** Setting the server address of DHCP pool "1" to 192.168.1.1.
- Switch(dhcp-1-config)#netbios-name-server 192.168.1.1

1.1.24 netbios-node-type

- **Command: netbios-node-type {b-node | h-node | m-node | p-node | *<type-number>*}**
    - **no netbios-node-type**
- **Function:** Sets the node type for the specified port; the "**no netbios-node-type**" command cancels the setting.
- **Parameters: b-node** stands for broadcasting node, **h-node** for hybrid node that broadcasts after point-to-point communication; **m-node** for hybrid node to communicate in point-to-point after broadcast; **p-node** for point-to-point node; *<type-number>* is the node type in Hex from 0 to FF.
- **Default:** No client node type is specified by default.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** If client node type is to be specified, it is recommended to set the client node type to **h-node** that broadcasts after point-to-point communication.
- **Example:** Setting the node type for client of pool 1 to broadcasting node.
- Switch(dhcp-1-config)#netbios-node-type b-node

1.1.25 network-address

- **Command: network-address *<network-number>* [*<mask>* | *<prefix-length>*]**
    - **no network-address**
- **Function:** Sets the scope for assignment for addresses in the pool; the "**no network-address**" command cancels the setting.
- **Parameters:** *<network-number>* is the network number; *<mask>* is the subnet mask in the decimal format; *<prefix-length>* stands for mask in prefix form. For example, mask 255.255.255.0 in prefix is "24", and mask 255.255.255.252 in prefix is "30". Note: When using DHCP server, the pool mask should be longer or equal to that of layer 3 interface IP address in the corresponding segment.
- **Default:** If no mask is specified, default mask will be assigned according to the address class.
- **Command Mode:** DHCP Address Pool Mode

- **Usage Guide:** This command sets the scope of addresses that can be used for dynamic assignment by the DHCP server; one address pool can only have one corresponding segment. This command is exclusive with the manual address binding command "hardware address" and "host".
- **Example:** Configuring the assignable address in pool 1 to be 10.1.128.0/24.
- Switch(dhcp-1-config)#network-address 10.1.128.0 24

1.1.26 next-server

- **Command: next-server <address1>[<address2>[…<address8>]]**
    - **no next-server**
- **Function:** Sets the server address for storing the client import file; the "**no next-server**" command cancels the setting.
- **Parameters: *<address1>…<address8>*** are IP addresses, in the decimal format.
- **Command Mode:** DHCP Address Pool Mode
- **Usage Guide:** This command configures the address for the server hosting client import file. This is usually used for diskless workstations that need to download configuration files from the server on boot up. This command is used together with "bootfile".
- **Example:** Setting the hosting server address as 10.1.128.4.
- Switch(dhcp-1-config)#next-server 10.1.128.4

1.1.27 option

- **Command: option *<code>* {ascii *<string>* | hex *<hex>* | ipaddress *<ipaddress>*}**
    - **no option *<code>***
- **Function:** Sets the network parameter specified by the option code; the "**no option *<code>***" command cancels the setting for option.
- **Parameters: *<code>*** is the code for network parameters; *<string>* is the ASCII string up to 255 characters; *<hex>* is a value in Hex that is no greater than 510 and must be of even length; *<ipaddress>* is the IP address in decimal format, up to 63 IP addresses can be configured.
- **Command Mode:** DHCP Address Pool Mode
- **Default:** None
- **Usage Guide:** The switch provides common commands for network parameter configuration as well as various commands useful in network configuration to meet different user needs. The definition of option code is described in detail in RFC2123.
- **Example:** Setting the WWW server address as 10.1.128.240.
- Switch(dhcp-1-config)#option 72 ip 10.1.128.240

1.1.28 service dhcp

- **Command: service dhcp**
    - **no service dhcp**

- **Function:** Enables DHCP server; the "**no service dhcp**" command disables the DHCP service.
- **Parameters:** None
- **Default:** DHCP service is disabled by default.
- **Command mode:** Global Mode
- **Usage Guide:** Both DHCP server and DHCP relay are included in the DHCP service. When DHCP services are enabled, both DHCP server and DHCP relay are enabled. Switch can only assign IP address for the DHCP clients and enable DHCP relay when DHCP server function is enabled.
- **Example:** Enabling DHCP server.
- Switch(config)#service dhcp

1.1.29 show ip dhcp binding

- **Command: show ip dhcp binding [[<*ip-addr*>] [type {all | manual | dynamic}] [count]]**
- **Function:** Displays IP-MAC binding information.
- **Parameters:** <*ip-addr*> is a specified IP address in decimal format; **all** stands for all binding types (manual binding and dynamic assignment); **manual** for manual binding; **dynamic** for dynamic assignment; **count** displays statistics for DHCP address binding entries.
- **Command mode:** Admin and Configuration Mode.
- **Example:**
- Switch# show ip dhcp binding
- IP address   Hardware address   Lease expiration   Type
- 10.1.1.233   00-00-E2-3A-26-04   Infinite   Manual
- 10.1.1.254   00-00-E2-3A-5C-D3   60   Automatic

Displayed information	Explanation
IP address	IP address assigned to a DHCP client
Hardware address	MAC address of a DHCP client
Lease expiration	Valid time for the DHCP client to hold the IP address
Type	Type of assignment: manual binding or dynamic assignment.

1.1.30 show ip dhcp conflict

- **Command: show ip dhcp conflict**

- **Function:** Displays log information for addresses that have a conflict record.
- **Command mode:** Admin and Configuration Mode.
- **Example:**
- Switch# show ip dhcp conflict
- IP Address   Detection method   Detection Time
- 10.1.1.1   Ping   FRI JAN 02 00:07:01 2002

Displayed information	Explanation
IP Address	Conflicting IP address
Detection method	Method in which the conflict is detected.
Detection Time	Time when the conflict is detected.

1.1.31 show ip dhcp relay information option

- **Command: show ip dhcp relay information option**
- **Function:** Show the relative configuration for DHCP relay option82.
- **Parameters:** None.
- **Command mode:** Admin and configuration mode
- **Default:** None.
- **Usage guide:** None.
- **Example:** Set the admin mode timeout value to 6 minutes.
- Switch#show ip dhcp relay information option
- ip dhcp server relay information option(i.e. option 82) is enabled
- ip dhcp relay information option(i.e. option 82) is enabled

1.1.32 show ip dhcp server statistics

- **Command: show ip dhcp server statistics**
- **Function:** Displays statistics of all DHCP packets for a DHCP server.
- **Command mode:** Admin and Configuration Mode.
- **Example:**
- Switch# show ip dhcp server statistics
- Address pools   3
- Database agents   0
- Automatic bindings   2
- Manual bindings   0
- Conflict bindings   0
- Expired bindings   0
- Malformed message   0

- Message   Received
- BOOTREQUEST   3814
- DHCPDISCOVER   1899
- DHCPREQUEST   6
- DHCPDECLINE   0
- DHCPRELEASE   1
- DHCPINFORM   1

- Message   Send
- BOOTREPLY   1911
- DHCPOFFER   6
- DHCPACK   6
- DHCPNAK   0
- DHCPRELAY   1907
- DHCPFORWARD   0
- Switch#

Displayed information	Explanation
Address pools	Number of DHCP address pools configured.
Database agents	Number of database agents.
Automatic bindings	Number of addresses assigned automatically
Manual bindings	Number of addresses bound manually
Conflict bindings	Number of conflicting addresses
Expired bindings	Number of addresses whose leases are expired
Malformed message	Number of error messages.
Message Received	Statistics for DHCP packets received
BOOTREQUEST	Total packets received

DHCPDISCOVER	Number of DHCPDISCOVER packets
DHCPREQUEST	Number of DHCPREQUEST packets
DHCPDECLINE	Number of DHCPDECLINE packets
DHCPRELEASE	Number of DHCPRELEASE packets
DHCPINFORM	Number of DHCPINFORM packets
Message Send	Statistics for DHCP packets sent
BOOTREPLY	Total packets sent
DHCPOFFER	Number of DHCPOFFER packets
DHCPACK	Number of DHCPACK packets
DHCPNAK	Number of DHCPNAK packets
DHCPRELAY	Number of DHCPRELAY packets
DHCPFORWARD	Number of DHCPFORWARD packets

1.2 Commands for DHCP Relay Configuration

1.2.1 ip dhcp broadcast suppress

- **Command: ip dhcp broadcast suppress**
  - **no ip dhcp broadcast suppress**
- **Function:** Enable DHCP broadcast suppress function, the no command disables the function.
- **Parameter:** None.
- **Default:** Disable.
- **Command Mode:** Global mode
- **Usage Guide:** Suppress the forwarding about DHCP broadcast packets, namely, drop or copy DHCP broadcast packets to CPU.
- **Example:** Enable DHCP broadcast suppress function.
- Switch(config)#ip dhcp broadcast suppress

1.2.2 ip dhcp relay share-vlan <vlanid> sub-vlan <vlanlist>

- This command is not supported by the switch.

1.2.3 ip forward-protocol udp bootps

- **Command: ip forward-protocol udp bootps**
- **no ip forward-protocol udp bootps**
- **Function:** Sets DHCP relay to forward UPD broadcast packets on the port; the "**no ip forward-protocol udp bootps**"command cancels the service.
- **Parameter: bootps** forwarding UDP port as 67 DHCP broadcast packets.
- **Default:** Not forward UPD broadcast packets by default.
- **Command mode:** Global Mode
- **Usage Guide:** The forwarding destination address is set in the "**ip helper-address**" command and described later.
- **Example:** Setting DHCP packets to be forwarded to 192.168.1.5.
- Switch(config)#ip forward-protocol udp boots
- Switch(config)#interface vlan 1
- Switch(Config-if-Vlan1)#ip helper-address 192.168.1.5

1.2.4 ip helper-address

- **Command: ip helper-address *<ip-address>***
    - **no ip helper-address *<ip-address>***
- **Function:** Specifies the destination address for the DHCP relay to forward UDP packets. The "**no ip helper-address *<ip-address>***" command cancels the setting.
- **Default:** None.
- **Command mode:** Interface Configuration Mode
- **Usage Guide:** The DHCP relay forwarding server address corresponds to the port forwarding UDP, i.e. DHCP relay forwards corresponding UDP packets only to the corresponding server instead of all UDP packets to all servers. When this command is run after "**ip forward-protocol udp *<port>***" command, the forwarding address configured by this command receives the UDP packets from ***<port>***. The combination of "**ip forward-protocol udp *<port>***" command and this command should be used for configuration.

1.2.5 show ip forward-protocol

- **Command: show ip forward-protocol**
- **Function:** Show the configured port ID of the protocol which support the forwarding of broadcast packets, it means the port ID for forwarding DHCP packets.
- **Command mode:** Admin and configuration mode
- **Example:**
- Switch#show ip forward-protocol
- Forward protocol(UDP port): 67(active)

1.2.6 show ip helper-address

- **Command: show ip helper-address**
- **Function:** Show the configuration relation for the port ID of the protocol (It can forward broadcast packets), the interface (It supports forwarding function) and the forwarded destination IP.
- **Command mode:** Admin and configuration mode
- **Example:**
- Switch#show ip helper-address
- Forward protocol   Interface   Forward server
- 67(active)   Vlan1   192.168.1.1

Chapter 2 COMMANDS FOR DHCPV6

2.1 clear ipv6 dhcp binding

- **Command: clear ipv6 dhcp binding [*<ipv6-address>*] [pd *<ipv6-prefix | prefix-length>*]**
- **Function:** To clear one specified DHCPv6 assigned address binding record or all the IPv6 address binding records.
- **Parameter:** *<ipv6-address>* is the specified IPv6 address with binding record; *<ipv6-prefix| prefix-length>* is the specified IPv6 prefix with binding record; To clear all IPv6 address binding record if there is no specified record.
- **Command Mode:** Admin Configuration Mode.
- **Usage Guide:** DHCPv6 IPv6 address binding information can be displayed through the command **show ipv6 dhcp binding**. If DHCPv6 client does not use the DHCPv6 allocated IPv6 address but when the life time of the IPv6 address does not end, the DHCPv6 server will not remove its bind for this address. In this situation, the address binding information can be removed manually through this command; and if no parameter is appended, this command will remove all the address binding information, then all addresses and prefix will be assigned again in the DHCPv6 address pool.
- **Example:** To delete all binding record of IPv6 address and prefix.
- Switch#clear ipv6 dhcp binding
- **Relative Command: show ipv6 dhcp binding**

2.2 clear ipv6 dhcp conflict

- **Command: clear ipv6 dhcp conflict [*<address>*]**
- **Function:** Clear the address with the conflict record in address conflict log.
- **Parameter:** *<address>* is the specified address with the conflict record, no specified address will clear all conflict records.
- **Command mode:** Admin Mode
- **Usage Guide:** With **show ipv6 dhcp conflict** command, the user can check the conflict in which IP addresses. With this command, the user can clears the conflict record of an address. If no specified address will clear the conflict record of all addresses in log. After the conflict records are cleared in log, these addresses can be used by DHCPv6 server again.
- **Example:** When administrator checks the conflict logs, administrator discovers that address 2001::1 with the conflict record is not used, so its record will be cleared from address conflict files.
- Switch#clear ipv6 dhcp conflict 2001::1

2.3 clear ipv6 dhcp statistics

- **Command: clear ipv6 dhcp statistics**

- **Function:** Clear the statistic records of DHCPv6 packets, the statistic counter of DHCPv6 packets is cleared.
- **Parameter:** None.
- **Command mode:** Admin Mode
- **Usage Guide:** With **show ipv6 dhcp statistics** command, the user can check the statistic information of the counter for DHCPv6 packets, all statistic information is an accumulative value. With this command will clear the counter to check the debugging conveniently.
- **Example:** Clear the counter of DHCPv6 packets.
- Switch#clear ipv6 dhcp statistics
- **Relative Command: show ipv6 dhcp statistics**

2.4 debug ipv6 dhcp client packet

- **Command: debug ipv6 dhcp client {event | packet}**
- **no debug ipv6 dhcp client {event | packet}**
- **Function:** To enable the debugging messages for protocol packets of DHCPv6 prefix delegation client, the no form of this command will disable the debugging information.
- **Default:** Disabled.
- **Command Mode:** Admin Mode.
- **Example:**
- Switch# debug ipv6 dhcp client packet

2.5 debug ipv6 dhcp detail

- **Command: debug ipv6 dhcp detail**
- **no debug ipv6 dhcp detail**
- **Function:** To display the debug information of all kinds of packets received or sent by DHCPv6, the no form of this command disabled this function.
- **Default:** Disabled.
- **Command Mode:** Admin Mode.
- **Example:**
- Switch# debug ipv6 dhcp detail

2.6 debug ipv6 dhcp relay packet

- **Command: debug ipv6 dhcp relay packet**
- **no debug ipv6 dhcp relay packet**
- **Function:** To enable the debugging information for protocol packets of DHCPv6 relay, the no form of this command will disable the debugging.
- **Default:** Disabled.
- **Command Mode:** Admin Mode.

- **Example:**
- Switch**#** debug ipv6 dhcp relay packet

2.7 debug ipv6 dhcp server

- **Command: debug ipv6 dhcp server { event | packet }**
    - **no debug ipv6 dhcp server { event | packet }**
- **Function:** To enable the debugging information of DHCPv6 server, the no form of this command will disable the debugging.
- **Parameter:** event is to enable debugging messages for DHCPv6 server events, such as address allocation; packet is for debugging messages of protocol packets of DHCPv6 server.
- **Default:** Disabled.
- **Command Mode:** Admin Mode.
- **Example:**
- Switch**#**debug ipv6 dhcp server packet

2.8 dns-server

- **Command: dns-server *<ipv6-address>***
- **no dns-server *<ipv6-address>***
- **Function:** To configure the IPv6 address of the DNS server for DHCPv6 client; the no form of this command will remove the DNS configuration.
- **Parameter: *<ipv6-address>*** is the IPv6 address of DNS Server.
- **Default:** No configured address pool of DNS Server by default.
- **Command Mode:** DHCPv6 Address Pool Configuration Mode.
- **Usage Guide:** For each address pool, at most three DNS server can be configured, and the addresses of the DNS server must be valid IPv6 addresses.
- **Example:** To configure the DNS Server address of DHCPv6 client as 2001:da8::1.
- Switch(dhcp-1-config)#dns-server 2001:da8::1

2.9 domain-name

- **Command: domain-name *<domain-name>***
- **no domain-name *<domain-name>***
- **Function:** To configure domain name of DHCPv6 client; the no form of this command will delete the domain name.
- **Parameter: *<domain-name>*** is the domain name, less than 32 characters.
- **Command Mode:** DHCPv6 Address Pool Configuration Mode.
- **Default:** The domain name parameter of address pool is not configured by default.
- **Usage Guide:** At most 3 domain names can be configured for each address pool.
- **Example:** To set the domain name of DHCPv6 client as test.com.cn

- Switch(dhcp-1-config)#domain-name test.com.cn

2.10 excluded-address

- **Command: excluded-address** ***<ipv6-address>***
- **no excluded-address** ***<ipv6-address>***
- **Function:** To configure the specified IPv6 address to be excluded from the address pool, the excluded address will not be allocated to any hosts; the no form of this command will remove the configuration.
- **Parameter:** ***<ipv6-address>*** is the IPv6 address to be excluded from being allocated to hosts in the address pool.
- **Default:** Disabled
- **Command Mode:** DHCPv6 address pool configuration mode.
- **Usage Guide:** This command is used to preserve the specified address from DHCPv6 address allocation.
- **Example:** To configure to exclude 2001:da8:123::1 from DHCPv6 address allocation.
- Switch(config)#excluded-address 2001:da8:123::1

2.11 ipv6 address

- **Command: ipv6 address** ***<prefix-name> <ipv6-prefix/prefix-length>***
    - **no ipv6 address** ***<prefix-name> <ipv6-prefix/prefix-length>***
- **Function:** To configure the specified interface to use prefix delegation for address allocation. The no form of this command will disable the using of prefix delegation for address allocation.
- **Parameters:** ***<prefix-name>*** is a string with its length no more than 32, designating or manual configuring the name of the address prefix defined in the prefix pool. ***<ipv6-prefix/prefix-length>*** is latter part of the IPv6 address excluding the address prefix, as well as its length.
- **Command Mode:** Interface Configuration Mode.
- **Default:** No global address is configured for interfaces by default.
- **Usage Guide:** The IPv6 address of an interface falls into two parts: ***<prefix-name>*** and ***<ipv6-prefix>/<prefix-length>***. If routing advertisement has been enabled, the first 64 bits of the addresses will be advertised. The address generated by ***<prefix-name>*** and ***<ipv6-prefix/prefix-length>*** combination will be removed, and the advertising of the prefix will be disabled. Only one ***<ipv6-prefix/prefix-length>*** can be configured for one prefix name.
- **Example:** If the prefix name my-prefix designates 2001:da8:221::/48, then the following command will add the address 2001:da8:221:2008::2008 to interface VLAN1.
- Switch(Config-if-Vlan1)# ipv6 address my-prefix 0:0:0:2008::2008/64

2.12 ipv6 dhcp client pd

- **Command: ipv6 dhcp client pd *<prefix-name>* [rapid-commit]**
  - o   **no ipv6 dhcp client pd**
- **Function:** To configure DHCPv6 prefix delegation client for the specified interface. The no form of this command will disable the DHCPv6 prefix delegation client and remove the allocated address prefix.
- **Parameters: *<prefix-name>*** is the string with its length no more than 32, which designates the name of the address prefix. If **rapid-commit** optional is specified and the prefix delegation server enables the rapid-commit function, then the prefix delegation server will reply the prefix delegation client with the REPLY message directly. And the prefix delegation request will be accomplished by exchanging messages once.
- **Command Mode:** Interface Configuration Mode.
- **Default:** DHCPv6 prefix delegation client is not enabled by default.
- **Usage Guide:** This command is used to configure the prefix delegation client on the specified interface, an interface with prefix delegation client enabled will send SOLICIT packets to try to get address prefix from the server. If the prefix is retrieved correctly, the address prefix in the global address pool can be used by the **ipv6 address** command to generate a valid IPv6 address. This command is exclusive with **ipv6 dhcp server** and **ipv6 dhcp relay destination**. If the prefix delegation client is disabled for an interface, then the address prefix which is get from this interface through prefix delegation client, will be removed from the global address pool. Also the interface address which is generated by the prefix delegation client will be removed, and routing advertisement with the prefix will be disabled. If any general prefix has been configured by the **ipv6 general-prefix** command, the same prefix learnt from prefix delegation will be disagreed.
- **Example:**
- Switch(Config-if-Vlan1)#ipv6 dhcp client pd ClientA rapid-commit

2.13 ipv6 dhcp client pd hint

- **Command: ipv6 dhcp client pd hint *<prefix|prefix-length>***
  - ▪   **no ipv6 dhcp client pd hint *<prefix|prefix-length>***
- **Function:** Designate the prefix demanded by the client and its length. The no operation of this command will delete that prefix and its length from the specified interface.
- **Parameters: *<prefix|prefix-length>*** means the prefix demanded by the client and its length.
- **Command Mode:** Interface Configure Mode.
- **Default Settings:** There is no such configuration in the system by default.
- **Usage Guide:** The system designates a prefix and its length on the interface for a client. If client prefix-proxy demanding function is enabled on the interface and hint function is enabled on the switch, the user will have prior claim to the prefix it demands and the

prefix length when the server allocates them. Only one hint prefix is allowed in the system.

- **Examples:**
- Switch(vlan-1-config)#ipv6 dhcp client pd hint 2001::/48

2.14 ipv6 dhcp pool

- **Command: ipv6 dhcp pool *<poolname>***
- **no ipv6 dhcp pool *<poolname>***
- **Function:** To configure the address pool for DHCPv6, and enter the DHCPv6 address pool configuration mode. In this mode, information such as the address prefix to be allocated, the DNS server addresses, and domain names, can be configured for the DHCPv6 client. The no form of this command will remove the configuration of the address pool.
- **Parameter: *< poolname>*** is the address pool name of DHCPv6 with its length no more than 32.
- **Default:** Any DHCPv6 address pool are not configured by default.
- **Command Mode:** Global Mode.
- **Usage Guide:** This command should be launched in global configuration mode, and falls in DHCPv6 address pool configuration mode if launched successfully. To remove a configured address pool, interface bindings related to the address pool, as well as the related address bindings will be removed.
- **Example:** To define an address pool, named 1.
- Switch(config)#ipv6 dhcp pool 1

2.15 ipv6 dhcp relay destination

- **Command: ipv6 dhcp relay destination {[*<ipv6-address>*] [interface { *<interface-name>* | vlan *<1-4096>* }] }**
    - ○ **no ipv6 dhcp relay destination { [*<ipv6-address>*] [interface { *<interface-name>* | vlan *<1-4096>* }] }**
- **Function:** To configure the destination to which the DHCPv6 relay forwards the DHCPv6 requests from the clients, the destination should be the address of an external DHCPv6 relay or the DHCPv6 server. The no form of this command will remove the configuration.
- **Parameters: *<ipv6-address>*** is the address of the destination to which the DHCPv6 relay forwards; ***<interface-name>*** or VLAN is the interface name or VLAN id which is used for forwarding of DHCPv6 requests, ***<interface-name>*** should be a lay three VLAN name, and the VLAN id is limited between 1 and 4096. If ***<ipv6-addess>*** is a global unicast address, the **interface** parameter should not be configured; If ***<ipv6-address>*** is an local address, the **interface** parameter is required be configured; The destination

address for the DHCPv6 server will be the multicast address of **ALL_DHCP_Servers (FF05::1:3)**, if the interface parameter is configured only.

- **Command Mode:** Interface Configuration Mode.
- **Default:** By default, destination address for DHCPv6 relay is not configured.
- **Usage Guide:** This command is used to configure the DHCPv6 relay for the specified interface, the address should be the address of another DHCPv6 relay or the address DHCPv6 server. At most three relay addresses can be configured for an interface. To be mentioned, the DHCPv6 relay stops working only if all the relay destination address configurations have been removed. This command is mutually exclusive to "**ipv6 dhcp server**" and "**ipv6 dhcp client pd**" commands.
- **Example:**
- Switch(Config-if-Vlan1)#ipv6 dhcp relay destination 2001:da8::1

2.16 ipv6 dhcp server

- **Command: ipv6 dhcp server *<poolname>* [preference *<value>*] [rapid-commit] [allow-hint]**
    - o **no ipv6 dhcp server *<poolname>***
- **Function:** This command configures the address pool which will be allocated by the DHCPv6 server through the specified interface. The no form of this command will remove the address pool configuration.
- **Parameters: *<poolname>*** is a string with its length less than 32, which designates the name of the address pool which is associated with the specified interface. If the **rapid-commit** option has been specified, the DHCPv6 server send a REPLY packet to the client immediately after receiving the SOLICIT packet. If the **preference** option has been specified, *<value>* will be the priority of the DHCPv6 server, with its value allowed between 0 and 255, and with 0 by default, the bigger the preference value is, the higher the priority of the DHCPv6 server. If the **allow-hint** option has been specified, the client expected value of parameters will be appended in its request packets.
- **Command Mode:** Interface Configuration Mode.
- **Default:** DHCPv6 address pool based on port is not configured by default.
- **Usage Guide:** This command configure the DHCPv6 address pool which is applied by the DHCPv6 server for the specified interface, as well as optional parameters. One VLAN can bind many DHCPv6 address pools and assign the address for DHCPv6 request packet from direct-link and relay delegation.
- **Example:**
- Switch(Config-if-Vlan1)#ipv6 dhcp server PoolA preference 80 rapid-commit allow-hint

2.17 ipv6 general-prefix

- **Command: ipv6 general-prefix *<prefix-name> <ipv6-prefix/prefix-length>***
    - ▪ **no ipv6 general-prefix *<prefix-name>***

- **Function:** To define an IPv6 general prefix. The no form of this command will delete the configuration.
- **Parameter:** *<prefix-name>* is a character string less than 32 characters, to use as IPv6 general prefix name. *<ipv6-prefix/prefix-length>* is defined as IPv6 general prefix.
- **Command Mode:** Global Mode.
- **Default:** IPv6 general prefix is not configured by default.
- **Usage Guide:** If IPv6 general prefix is configured, the interface will use the configured prefix for IPv6 address generating. Commonly, the general prefix is used for enterprise IPv6 prefix, and when entering an IPv6 address, users can simply add the address suffix of to the name of the general prefix. The configured address prefix will be reserved in the general address prefix pool. At most 8 general prefix can be configured at the same time. When trying to remove a configured general prefix name, the operation will fail if any interfaces used the configured prefix. Only one general prefix for a prefix name. The general prefix can not use the same prefix definition with prefixes learnt from prefix delegation.
- **Example:** To set the prefix of 2001:da8:221::/48 to general prefix my-prefix.
- Switch(config)# ipv6 general-prefix my-prefix 2001:da8:221::/48

2.18 ipv6 local pool

- **Command: ipv6 local pool** *<poolname> <prefix/prefix-length> <assigned-length>*
    - **no ipv6 local pool** *<poolname>*
- **Function:** To configure the address pool for prefix delegation. The no form of this command will remove the IPv6 prefix delegation configuration.
- **Parameters:** *<poolname>* is the name for the IPv6 address pool of the prefix delegation, the length name string should be less than 32. *<prefix/prefix-length>* is the address prefix and its length of the prefix delegation. *<assigned-length>* is the length of the prefix in the address pool which can be retrieved by the client, the assigned prefix length should be no less than the value of *<prefix-length>*
- **Command Mode:** Global Mode.
- **Default:** No IPv6 prefix delegation address pool is configured by default.
- **Usage Guide:** This command should be used with the "**prefix delegation pool**" command to allocate address prefixes to the clients. If IPv6 prefix delegation is removed, the associated "**prefix delegation**" command will be in-effective either.

2.19 lifetime

- **Command: lifetime {***<valid-time>* **| infinity} {***<preferred-time>* **| infinity}**
    - **no lifetime**
- **Function:** To configure the life time for the addresses or the address prefixes allocated by DHCPv6. The no form of this command will restore the default setting.

- **Parameters:** *<valid-time>* and *<preferred-time>* are the valid life time and preferred life time respectively for the allocated IPv6 addresses in the local address pool. Its value is allowed to be between 1 and 31536000 in seconds, and *<preferred-time>* should never be bigger than *<valid-time>*. The **infinity** parameter designates the maximum life time.
- **Command Mode:** DHCPv6 Address Pool Configuration Mode.
- **Default:** The default valid life time and preferred life time are 2592000 seconds (30 days) and 604800 seconds (7 days) respectively.
- **Example:** To configure the valid life time as 1000 seconds, and the preferred life time as 600 seconds.
- Switch(config)#lifetime 1000 600

2.20 network-address

- **Command:** network-address *<ipv6-pool-start-address>* {*<ipv6-pool-end-address>* | *<prefix-length>*} [eui-64]
   - **no network-address**
- **Function:** To configure the DHCPv6 address pool; the no form of this command will remove the address pool configuration.
- **Parameters:** *<ipv6-pool-start-adderss>* is the start of the address pool; *<ipv6-pool-end-address>* is the end of the address pool; *<prefix-length>* is the length of the address prefix, which is allowed to be between 3 and 128, and 64 by default, the size of the pool will be determined by *<prefix-length>* if it has been specified. *<ipv6-pool-end-address>* and *<prefix-length>* alternative options to determine the size of the IPv6 address pool. If *<prefix-length>* is 64 and the **eui-64** option has been configured, the DHCPv6 server will allocate IPv6 addresses according to the EUI-64 standard, or the DHCPv6 server will be allocating addresses sequentially.
- **Default:** No address pool is configured by default.
- **Command Mode:** DHCPv6 Address Pool Configuration Mode.
- **Usage Guide:** This command configures the address pool for the DHCPv6 server to allocate addresses, only one address range can be configured for each address pool. To be noticed, if the DHCPv6 server has been enabled, and the length of the IPv6 address prefix has been configured, the length of the prefix in the address pool should be no less than the length of the prefix of the IPv6 address of the respective layer three interfaces in the switch. If *<ipv6-pool-end-address>* is bigger than *<ipv6-pool-start-address>*, this command returns at once.
- **Example:** To configure the address range for address pool as 2001:da8:123::100-2001:da8:123::200.
- Switch(dhcp-1-config)#network-address 2001:da8:123::100 2001:da8:123::200
- **Relative Command: excluded-address**

2.21 prefix-delegation

- o **Command: prefix-delegation** *<ipv6-prefix/prefix-length> <client-DUID>* **[iaid** *<iaid>*] **[lifetime {***<valid-time>* **| infinity} {***<preferred-time>* **| infinity}]**
- o **no prefix-delegation** *<ipv6-prefix/prefix-length> <client-DUID>* **[iaid** *<iaid>*]
- **Function:** To configure dedicated prefix delegation for the specified user. The no form of this command will remove the dedicated prefix delegation.
- **Parameters:** *<ipv6-prefix/prefix-length>* is the length of the prefix to be allocated to the client. *<client-DUID>* is the DUID of the client. DUID with the type of DUID-LLT and DUID-LL are supported, the DUID of DUID-LLT type should be of 14 characters. *<iaid>* is the value to be appended in the IA_PD field of the clients' requests. *<valid-time>* and *<preferred-time>* are the valid life time and the preferred life time of the IPv6 address allocated to the clients respectively, in seconds, and its value is allowed between 1 and 31536000. However, *<preferred-time>* should never be bigger than *<valid-time>*. If not configured, the default *<valid-time>* will be 2592000, while *<preferred-time>* will be 604800. The **infinity** parameter means the life time is infinity.
- **Command Mode:** DHCPv6 Address Pool Configuration Mode.
- **Default:** Disabled.
- **Usage Guide:** This command configures the specified IPv6 address prefix to bind with the specified client. If no IAID is configured, any IA of any clients will be able get this address prefix. At most eight static binding address prefix can be configured for each address pool. For prefix delegation, static binding is of higher priority than the prefix address pool.
- **Example:** The following command will allocate 2001:da8::/48 to the client with DUID as 0001000600000005000BBFAA2408, and IAID as 12.
- Switch(dhcp-1-config)#prefix-delegation   2001:da8::/48 0001000600000005000BBFAA2408 iaid 12

2.22 prefix-delegation pool

- **Command: prefix-delegation pool** *<poolname>* **[lifetime {***<valid-time>* **| infinity} {***<preferred-time>* **| infinity}]**
  - ▪ **no prefix-delegation pool** *<poolname>*
- **Function:** To configure prefix delegation name used by DHCPv6 address pool. The no form of this command deletes the configuration.
- **Parameters:** *<poolname>* is the name of the address prefix pool, the length name string should be less than 32. *<valid-time>* and *<preferred-time>* are the valid life time and the preferred life time of the IPv6 address allocated to the clients respectively, in seconds, and its value is allowed between 1 and 31536000.However, *<preferred-time>* should never be bigger than *<valid-time>*. If not configured, the default *<valid-time>* will be 2592000, while *<preferred-time>* will be 604800. The **infinity** parameter means the life time is infinity.
- **Command Mode:** DHCPv6 address pool configuration mode.

- **Default:** The prefix delegation name used by DHCPv6 address pool is not configured.
- **Usage Guide:** This command configures the name of the address prefix pool for address allocation. If configured, the addresses in the prefix address pool will be allocated to the clients. This command can be used in association with the **ipv6 local pool** command. For one address pool, only one prefix delegation pool can be bound. When trying to remove the prefix name configuration, the prefix delegation service of the server will be unavailable, if both the address pool is not associated with the prefix delegation pool and no static prefix delegation binding is enabled.
- **Example:**
- Switch(dhcp-1-config)#prefix-delegation pool abc

2.23 service dhcpv6

- **Command: service dhcpv6**
    - **no service dhcpv6**
- **Function:** To enable DHCPv6 server function; the no form of this command disables the configuration.
- **Parameter:** None.
- **Default:** Disabled.
- **Command Mode:** Global Mode.
- **Usage Guide:** The DHCPv6 services include DHCPv6 server function, DHCPv6 relay function, DHCPv6 prefix delegation function. All of the above services are configured on ports. Only when DHCPv6 server function is enabled, the IP address assignment of DHCPv6 client, DHCPv6 relay and DHCPv6 prefix delegation functions enabled can be configured on ports.
- **Example:** To enable DHCPv6 server.
- Switch(config)#service dhcpv6

2.24 show ipv6 dhcp

- **Command: show ipv6 dhcp**
- **Function:** To show the enable switch and DUID of DHCPv6 service.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To show the enable switch and DUID of DHCPv6 service, server identifier options only use DUID of DUID-LLT type.
- **Example:**
- Switch#show ipv6 dhcp
- DHCPv6 is enabled
- LLT DUID is <00:01:00:01:43:b7:1b:81:00:03:0f:01:5f:9d>
- LL DUID is <00:03:00:01:00:03:0f:01:5f:9d>

2.25 show ipv6 dhcp binding

- **Command: show ipv6 dhcp binding [<*ipv6-address*>| pd <*ipv6-prefix|prefix-length*>|count]**
- **Function:** To show all the address and prefix binding information of DHCPv6.
- **Parameter:** <*ipv6-address*> is the specified IPv6 address; **count** show the number of DHCPv6 address bindings.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To show all the address and prefix binding information of DHCPv6, include type, DUID, IAID, prefix, valid time and so on.
- **Example:**
- Switch#show ipv6 dhcp binding
- Client: iatype IANA, iaid 0x0e001d92
- DUID: 00:01:00:01:0f:55:82:4f:00:19:e0:3f:d1:83
- IANA leased address: 2001:da8::10
- Preferred lifetime 604800 seconds, valid lifetime 2592000 seconds
- Lease obtained at %Jan 01 01:34:44 1970
- Lease expires at %Jan 31 01:34:44 1970 (2592000 seconds left)

- The number of DHCPv6 bindings is 1

2.26 show ipv6 dhcp conflict

- **Command: show ipv6 dhcp conflict**
- **Function:** Show the log for the address that have a conflict record.
- **Command mode:** Admin and Configuration Mode.
- **Example:**
- Switch# show ipv6 dhcp conflict

2.27 show ipv6 dhcp interface

- **Command: show ipv6 dhcp interface [<*interface-name*>]**
- **Function:** To show the information for DHCPv6 interface.
- **Parameter:** <*interface-name*> is the name and number of interface, if the<*interface-name*> parameter is not provided, then all the DHCPv6 interface information will be shown.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To show the information for DHCPv6 interface, include Port Mode (Prefix delegation client、DHCPv6 server、DHCPv6 relay), and the relative conformation information under all kinds of mode.
- **Example:**

- Switch#show ipv6 dhcp interface vlan10
- Vlan10 is in server mode
- Using pool: poolv6
- Preference value: 20
- Rapid-Commit is disabled

2.28 show ipv6 dhcp pool

- **Command: show ipv6 dhcp pool [*<poolname>*]**
- **Function:** To show the DHCPv6 address pool information.
- **Parameter:** *<poolname>* is the DHCPv6 address pool name which configured already, and the length less than 32 characters. If the *<poolname>* parameter is not provided, then all the DHCPv6 address pool information will be shown.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To display the configuration and dynamic assignment information for DHCPv6 address pool, include the name of DHCPv6 address pool, the prefix of DHCPv6 address pool, excluded address, DNS server configuration, relative prefix information and so on. To display assigned address binding number of address pool that is used as address assignment server. To display assigned prefix number of address pool that is used as prefix delegation server.
- **Example:**
- Switch#show ipv6 dhcp pool poolv6

2.29 show ipv6 dhcp statistics

- **Command: show ipv6 dhcp statistics**
- **Function:** To show the statistic of all kinds of DHCPv6 packets by DHCPv6 server.
- **Command Mode:** Admin and Configuration Mode.
- **Example:**
- Switch#show ipv6 dhcp server statistics
- Address pools   1
- Active bindings   0
- Expiried bindings   0
- Malformed message   0

- Message   Recieved
- DHCP6SOLICIT   0
- DHCP6ADVERTISE   0
- DHCP6REQUEST   0
- DHCP6REPLY   0
- DHCP6RENEW   0

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- DHCP6REBIND   0
- DHCP6RELEASE   0
- DHCP6DECLINE   0
- DHCP6CONFIRM   0
- DHCP6RECONFIGURE   0
- DHCP6INFORMREQ   0
- DHCP6RELAYFORW   0
- DHCP6RELAYREPLY   0

- Message   Send
- DHCP6SOLICIT   0
- DHCP6ADVERTISE   0
- DHCP6REQUEST   0
- DHCP6REPLY   0
- DHCP6RENEW   0
- DHCP6REBIND   0
- DHCP6RELEASE   0
- DHCP6DECLINE   0
- DHCP6CONFIRM   0
- DHCP6RECONFIGURE   0
- DHCP6INFORMREQ   0
- DHCP6RELAYFORW   0
- DHCP6RELAYREPLY   0

Show information	Explanation
Address pools	To configure the number of DHCPv6 address pools;
Active bindings	The number of auto assign addresses;
Expiried bindings	The number of expiried bindings;
Malformed message	The number of malformed messages;
Message Recieved	The statistic of received DHCPv6 packets.
DHCP6SOLICIT	The number of DHCPv6 SOLICIT packets.

DHCP6ADVERTISE	The number of DHCPv6 ADVERTISE packets.
DHCPv6REQUEST	The number of DHCPv6 REQUEST packets.
DHCP6REPLY	The number of DHCPv6 REPLY packets.
DHCP6RENEW	The number of DHCPv6 RENEW packets.
DHCP6REBIND	The number of DHCPv6 REBIND packets.
DHCP6RELEASE	The number of DHCPv6 RELEASE packets.
DHCP6DECLINE	The number of DHCPv6 DECLINE packets.
DHCP6CONFIRM	The number of DHCPv6 CONFIRM packets.
DHCP6RECONFIGURE	The number of DHCPv6 RECONFIGURE packets.
DHCP6INFORMREQ	The number of DHCPv6 INFORMREQ packets.
DHCP6RELAYFORW	The number of DHCPv6 RELAYFORW packets.
DHCP6RELAYREPLY	The number of DHCPv6 RELAYREPLY packets.
Message Send	The statistic of sending DHCPv6 packets
DHCP6SOLICIT	The number of DHCPv6 SOLICIT packets.
DHCP6ADVERTISE	The number of DHCPv6 ADVERTISE packets.
DHCPv6REQUEST	The number of DHCPv6 REQUEST packets.
DHCP6REPLY	The number of DHCPv6 REPLY packets.
DHCP6RENEW	The number of DHCPv6 RENEW packets.
DHCP6REBIND	The number of DHCPv6 REBIND packets.
DHCP6RELEASE	The number of DHCPv6 RELEASE packets.

DHCP6DECLINE	The number of DHCPv6 DECLINE packets.
DHCP6CONFIRM	The number of DHCPv6 CONFIRM packets.
DHCP6RECONFIGURE	The number of DHCPv6 RECONFIGURE packets.
DHCP6INFORMREQ	The number of DHCPv6 INFORMREQ packets.
DHCP6RELAYFORW	The number of DHCPv6 RELAYFORW packets.

2.30 show ipv6 general-prefix

- **Command: show ipv6 general-prefix**
- **Function:** To show the IPv6 general prefix pool information.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To show the IPv6 general prefix pool information, include the prefix number in general prefix pool, the name of every prefix, the interface of prefix obtained, and the prefix value.
- **Example:**
- Switch#show ipv6 general-prefix

2.31 show ipv6 local pool

- **Command: show ipv6 local pool**
- **Function:** To show the statistic information of DHCPv6 prefix pool.
- **Command Mode:** Admin and Configuration Mode.
- **Usage Guide:** To show the statistic information of DHCPv6 prefix pool, include the name of prefix pool, the prefix and prefix length as well as assigned prefix length, the number of assigned prefix and information in DHCPv6 address pool.
- **Example:**
- Switch#show ipv6 local pool
- Pool   Prefix   Free   In use
- a   2010::1/48   65536   0

Chapter 3 COMMANDS FOR DHCP OPTION 82

3.1 debug ip dhcp relay packet

- **Command: debug ip dhcp relay packet**
- **Function:** This command is used to display the information of data packets processing in DHCP Relay Agent, including the "add" and "peel" action of option 82.
- **Parameters:** None
- **Command Mode:** Admin Mode.
- **User Guide:** Use this command during the operation to display the procedure of data packets processing of the server and to display the corresponding option82 operation information. Identified option 82 information of the request message and the option 82 information returned by the reply message.
- **Example:** Display the information of data packets processing in DHCP Relay Agent.
- Switch(config)# debug ip dhcp relay packet

3.2 ip dhcp relay information option

- **Command: ip dhcp relay information option**
- **no ip dhcp relay information option**
- **Function:** Set this command to enable the option82 function of the switch Relay Agent. The "**no ip dhcp relay information option**" command is used to disable the option82 function of the switch Relay Agent.
- **Parameters:** None.
- **Default Settings:** The system disables the option82 function by default.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Only the DHCP Relay Agents configuring with this command can add option82 to the DHCP request message, and let the server to process it. Before enabling this function, users should make sure that the DHCP service is enabled and the Relay Agent will transmit the udp broadcast messages whose destination port is 67.
- **Example:** Enable the option82 function of the Relay Agent.
- Switch(config)#service dhcp
- Switch(config)# ip forward-protocol udp bootps
- Switch(config)# ip dhcp relay information option

3.3 ip dhcp relay information option delimiter

- **Command: ip dhcp relay information option delimiter [colon | dot | slash | space]**
- **no ip dhcp relay information option delimiter**
- **Function:** Set the delimiter of each parameter for suboption of option82 in global mode, no command restores the delimiter as slash.

- **Parameters:** None.
- **Default Settings:** slash ("/").
- **Command Mode:** Global mode
- **Usage Guide:** Divide the parameters with the configured delimiters after users have defined them which are used to create suboption (remot-de, circuit-id) of option82 in global mode.
- **Example:** Set the parameter delimiters as dot (".") for suboption of option82.
- Switch(config)#ip dhcp relay information option delimiter dot

3.4 ip dhcp relay information option remote-id

- **Command: ip dhcp relay information option remote-id {standard | *<remote-id>*}**
    - **no ip dhcp relay information option remote-id**
- **Function:** Set the suboption2 (remote ID option) content of option 82 added by DHCP request packets (They are received by the interface). The no command sets the additive suboption2 (remote ID option) format of option 82 as standard.
- **Parameters: standard** means the default VLAN MAC format. *<remote-id>* means the remote-id content of option 82 specified by users, its length can not exceed 64 characters.
- **Command Mode:** Global Mode
- **Default:** Use standard format to set remote-id of option 82.
- **Usage Guide:** The additive option 82 information needs to associate with third-party DHCP server, it is used to specify the remote-id content by users when the standard remote-id format can not satisfy server's request.
- **Example:** Set the suboption remote-id of DHCP option82 as street-1-1.
- Switch(config)#ip dhcp relay information option remote-id street-1-1

3.5 ip dhcp relay information option remote-id format

- **Command: ip dhcp relay information option remote-id format {default | vs-hp}**
- **Function:** Set remote-id format of Relay Agent option82.
- **Parameters:** default means that remote-id is the VLAN MAC address with hexadecimal format; vs-hp means that remote-id is compatible with the remote-id format of HP manufacturer.
- **Default:** default.
- **Command Mode:** Global mode
- **Usage Guide:** The default remote-id format defined as below:

Remote option
type   Length

2	6	MAC

1 byte   1 byte   6 byte
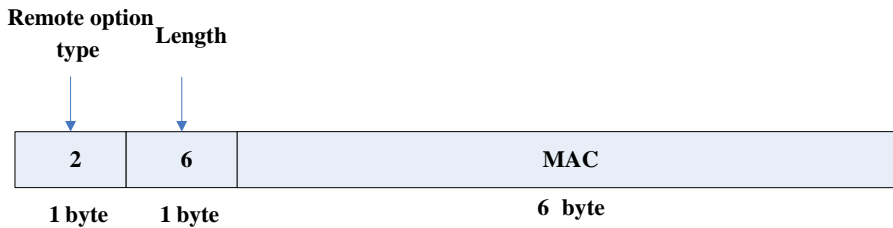
- MAC means VLAN MAC address.
- The compatible remote-id format with HP manufacturer defined as below:

Remote option
type   Length

2	4	IP

1 byte   1 byte   4 byte
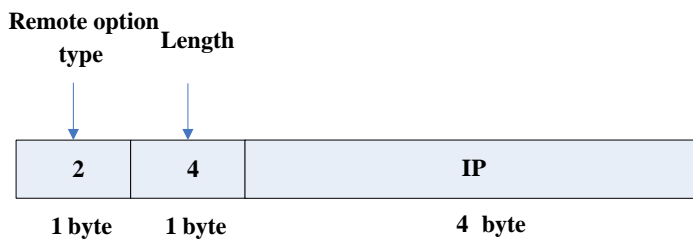
- IP means the primary IP address of layer 3 interface where DHCP packets from.
- **Example:** Set remote-id of Relay Agent option82 as the compatible format with HP manufacturer.
- Switch(config)#ip dhcp relay information option remote-id format vs-hp

3.6 ip dhcp relay information option self-defined remote-id

- **Command: ip dhcp relay information option self-defined remote-id {hostname | mac | string WORD}**
  - o **no ip dhcp relay information option self-defined remote-id**
- **Function:** Set creation method for option82, users can define the parameters of remote-id suboption by themselves.
- **Parameters: WORD** the defined character string of remote-id by themselves, the maximum length is 64.
- **Command Mode:** Global Mode
- **Default:** Using standard method.
- **Usage Guide:** After configure this command, if users do not configure remote-id on interface, it will create remote-id suboption for option82 according to self-defined method. For mac, use the format such as 00-02-d1-2e-3a-0d if it is filled to packets with ascii format, but hex format occupies 6 bytes. Each option will be filled to packets according to the configured order of the commands and divide them with delimiter (delimiter is **ip dhcp relay information option delimiter** configuration).
- **Example:** Set self-defined method and character string of remote-id suboption are hostname and abc respectively for option82.
- Switch(config)#ip dhcp relay information option self-defined remote-id hostname string abc

3.7 ip dhcp relay information option self-defined remote-id format

- **Command: ip dhcp relay information option self-defined remote-id format [ascii | hex]**
- **Function:** Set self-defined format of remote-id for relay option82.
- **Parameters:** None.
- **Command Mode:** Global Mode
- **Default:** ascii.
- **Usage Guide:** self-defined format use ip dhcp relay information option type self-defined remote-id to create remote-id format.
- **Example:** Set self-defined method of remote-id as hex for relay option82.
- Switch(config)# ip dhcp relay information option self-defined remote-id format hex

3.8 ip dhcp relay information option self-defined subscriber-id

- **Command: ip dhcp relay information option self-defined subscriber-id {vlan | port | id (switch-id (mac | hostname)| remote-mac)| string WORD }**
  - **no ip dhcp relay information option self-defined subscriber-id**
- **Function:** Set creation method for option82, users can define the parameters of circute-id suboption by themselves.
- **Parameters: WORD** the defined character string of circuit-id by themselves, the maximum length is 64.
- **Command Mode:** Global Mode
- **Default:** Using standard method.
- **Usage Guide:** After configure this command, if users do not configure circuit-id on interface, it will create circuit-id suboption for option82 according to self-defined method. Self-defined format of circuit-id: if self-defined format is ascii, the filled format of vlan such as "Vlan2", the format of port such as "Ethernet1/0/1", the format of mac and remote-mac such as "00-02-d1-2e-3a-0d". If self-defined format is hex, the filled format of vlan occupies 2 bytes, port occupies 4 bytes, a byte means slot (for chassis switch, it means slot ID, for box switch, it is 1), a byte means Module (the default is 0), two bytes means port ID beginning from 1, mac and remote-mac occupy 6 bytes. Each option will be filled to packets according to the configured order of the commands and divide them with delimiter (delimiter is **ip dhcp relay information option delimiter** configuration).
- **Example:** Set self-defined method of circuit-id suboption as port, mac for option82.
- Switch(config)# ip dhcp relay information option self-defined subscriber-id port id switch-id mac

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3.9 ip dhcp relay information option self-defined subscriber-id format

- **Command: ip dhcp relay information option self-defined subscriber-id format [ascii | hex]**
- **Function:** Set self-defined format of circuit-id for relay option82.
- **Parameters:** None.
- **Command Mode:** Global Mode
- **Default:** ascii.
- **Usage Guide:** self-defined format use ip dhcp relay information option type self-defined subscriber-id to create circuit-id format.
- **Example:** Set self-defined format of circuit-id as hex for relay option82.
- Switch(config)# ip dhcp relay information option self-defined subscriber-id format hex

3.10 ip dhcp relay information option subscriber-id

- **Command: ip dhcp relay information option subscriber-id {standard | *<circuit-id>*}**
- **no ip dhcp relay information option subscriber-id**
- **Function:** This command is used to set the format of option82 sub-option1(Circuit ID option) added to the DHCP request messages from interface, **standard** means the standard vlan name and physical port name format, like "Vlan2+Ethernet1/0/12", *<circuit-id>* is the circuit-id contents of option82 specified by users, which is a string no longer than 64 characters. The "**no ip dhcp relay information option subscriber-id**" command will set the format of added option82 sub-option1 (Circuit ID option) as standard format.
- **Parameters:** None
- **Command Mode:** Interface configuration mode.
- **Default Settings:** The system uses the standard format to set the circuit-id of option 82 by default.
- **User Guide:** Because the option 82 information added for the switch should cooperate with the third party DHCP server, if the standard circuit-id format of the switch cannot satisfy the server's request, this method will be provided for users to specify the contents of circuit-id according to the situation of the server.
- **Example:** Set the sub-option circuit-id of DHCP option82 as foobar.
- Switch(config-if-vlan1)#ip dhcp relay information option subscriber-id foobar

3.11 ip dhcp relay information option subscriber-id format

- **Command: ip dhcp relay information option subscriber-id format {hex | acsii | vs-hp}**
- **Function:** Set subscriber-id format of Relay Agent option82.
- **Parameters:** hex means that subscriber-id is VLAN and port information with hexadecimal format, acsii means that subscriber-id is VLAN and port information with

ACSII format. vs-hp means that subscriber-id is compatible with the format of HP manufacturer.

- **Command Mode:** Global mode
- **Default:** ascii.
- **User Guide:** VLAN and port information with ASCII format, such as "Vlan1+Ethernet1/0/11", VLAN and port information with hexadecimal format defined as below:

Suboption type	Length	Circuit ID type	Length	VLAN	Slot	Module	Port
1	8	0	6	VLAN	Slot	Module	Port
1 byte	1 byte	1 byte	1 byte	2 byte	1 byte	1 byte	2 byte

- VLAN field fills in VLAN ID. For chassis switch, Slot means slot number, for box switch, Slot is 1; default Module is 0; Port means port number which begins from 1.
- The compatible subscriber-id format with HP manufacturer defined as below:

Suboption type	Length	Port
1	2	Port
1 byte	1 byte	2 byte
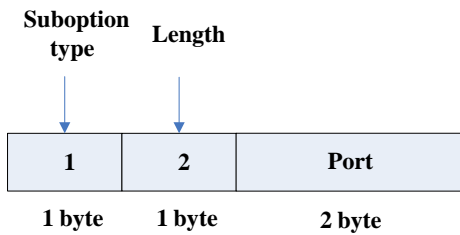
- Port means port number which begins from 1.
- **Example:** Set subscriber-id format of Relay Agent option82 as hexadecimal format.
- Switch(config)#ip dhcp relay information option subscriber-id format hex
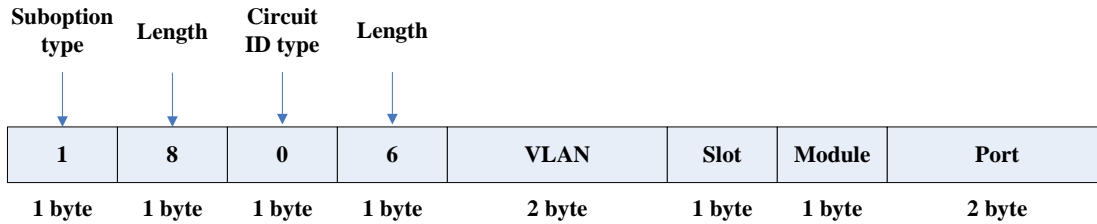
3.12 ip dhcp relay information policy

- **Command: ip dhcp relay information policy {drop | keep | replace}**
- **no ip dhcp relay information policy**
- **Function:** This command is used to set the retransmitting policy of the system for the received DHCP request message which contains option82. The drop mode means that if the message has option82, then the system will drop it without processing; keep mode means that the system will keep the original option82 segment in the message, and forward it to the server to process; replace mode means that the system will replace the option 82 segment in the existing message with its own option 82, and forward the message to the server to process. The "no ip dhcp relay information policy" will set the retransmitting policy of the option 82 DCHP message as "replace".
- **Parameters:** None
- **Command Mode:** Interface configuration mode.

- **Default Settings:** The system uses replace mode to replace the option 82 segment in the existing message with its own option 82.
- **User Guide:** Since the DHCP client messages might go through several DHCP Relay Agents when passed to the DHCP server, the latter Relay Agents on the path should set policies to decide how to process the option82 added by Relay Agents before them. The selection of option 82 retransmitting policies should take the configuration policy of the DHCP server into account.
- **Example:** Set the retransmitting policy of DHCP messages option 82 as keep.
- Switch(Config-if-Vlan1)# ip dhcp relay information policy keep

3.13 ip dhcp server relay information enable

- **Command: ip dhcp server relay information enable**
- **no ip dhcp server relay information enable**
- **Function:** This command is used to enable the switch DHCP server to identify option82. The "no ip dhcp server relay information enable" command will make the server ignore the option 82.
- **Parameters:** None
- **Command Mode:** Global configuration mode
- **Default Setting:** The system disable the option82 identifying function by default.
- **User Guide:** If the users want the switch DHCP server to identify option82 and return option 82 information in the reply message, this command needs to be set, or, the switch DHCP server will ignore the option82.
- **Example:** Set the DHCP server to support option82
- Switch(Config-if-Vlan1)# ip dhcp server relay information enable

3.14 show ip dhcp relay information option

- **Command: show ip dhcp relay information option**
- **Function:** This command will display the state information of the DHCP option 82 in the system, including option82 enabling switch, the interface retransmitting policy, the circuit ID mode and the switch DHCP server option82 enabling switch.
- **Parameters:** None.
- **Command Mode:** Admin and Global Configuration Mode.
- **User Guide:** Use this command to check the state information of Relay Agent option82 during operation.
- **Example:**
- Switch#show ip dhcp relay information option
- ip dhcp server relay information option(i.e. option 82) is disabled
- ip dhcp relay information option(i.e. option 82) is enabled
- Vlan2:
- ip dhcp relay information policy keep

- ip dhcp relay information option subscriber-id standard
- Vlan3:
- ip dhcp relay information policy replace
- ip dhcp relay information option subscriber-id foobar

Chapter 4 COMMANDS FOR DHCPV6 OPTION37, 38

4.1 Commands for DHCPv6 option37, 38

4.1.1 address range

- **Command: address range** *<start-ip> <end-ip>*
    - **no address range** *<start-ip> <end-ip>*
- **Function:** This command is used to set address range for a DHCPv6 class in DHCPv6 address pool configuration mode, the no command is used to remove the address range. The prefix/plen form is not supported.
- **Parameters: start-ip**, defines the start address of the address pool
    - **end-ip**, defines the end address of the address pool
- **Default:** None.
- **Command Mode:** DHCPv6 address pool class configuration mode
- **Usage Guide:** It is necessary to check the address range assigned to class in order to make sure that it doesn't exceed the address range of relevant address pool. A class is assigned a single address range and the address range assigned to different class in the same address pool can overlap. If you do not use this command to assign address range for a DHCPv6 class, then the range for it will be the whole subnet of the address pool by default.
- **Example:** Associate a DHCPv6 class named CLASS1 to dhcpv6 pool 1 and assign the address range from 2001:da8:100:1::2 to 2001:da8:100:1::30 for CLASS1.
- Switch(Config)#ipv6 dhcp pool 1
- Switch(dhcp-1-config)#class CLASS1
- Switch(dhcp-1-class-CLASS1-config)#address   range   2001:da8:100:1::2 2001:da8:100:1::30

4.1.2 class

- **Command: class** *<class-name>*
    - **no class** *<class-name>*
- **Function:** This command associates class to address pool in DHCPv6 address pool configuration mode and enters class configuration mode in address pool. Use the no command to remove the link.
- **Parameters:** class-name, the name of DHCPv6 class.
- **Default:** None.
- **Command Mode:** DHCPv6 address pool configuration mode
- **Usage Guide:** It is recommended to define this class first using global command of IPv6 DHCP class. No class will be created if you input a class name which doesn't exist.
- **Example:** Associate the DHCPv6 class named CLASS1 to dhcpv6 pool 1.
- Switch(Config)#ipv6 dhcp pool 1
- Switch(dhcp-1-config)#class CLASS1

4.1.3 ipv6 dhcp class

- **Command: ipv6 dhcp class *<class-name>***
  - **no ipv6 dhcp class *<class-name>***
- **Function:** This command defines a DHCPv6 class and enters DHCPv6 class configuration mode, the no operation of this command removes this DHCPv6 class.
- **Parameters: class-name**, the name of DHCPv6 class which is a string with a length of less than 32
- **Default:** None.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Configure a group of option 37 or option 38, or configure option 37 and option 38 simultaneously in a DHCPv6 class. This command can be used when the server supports DHCPv6 class only.
- **Example:** Define a DHCPv6 class named CLASS1.
- Switch(Config)# ipv6 dhcp class CLASS1

4.1.4 ipv6 dhcp relay remote-id

- **Command: ipv6 dhcp relay remote-id *<remote-id>***
  - **no ipv6 dhcp relay remote-id**
- **Function:** This command is used to set the form of adding option 37 in received DHCPv6 request packets, of which <remote-id> is the remote-id in user-defined option 37 and it is a string with a length of less than 128. The no operation of this command restores remote-id in option 37 to enterprise-number together with vlan MAC address.
- **Parameters: remote-id**, user-defined content of option 37.
- **Default:** Using vlan MAC address as remote-id content by default such as "00-01-ac-12-23" with '-' hyphen.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Because the option 37 information added by switch may associate with third-party DHCPv6 servers, users can specify the remote-id content based on server condition when default remote-id of the switch cannot satisfy the demand of server. The enterprise-number together with vlan MAC address is used as the remote-id by default.
- **Example:** Enable abc as the remote-id of DHCPv6 option 37.
- Switch(Config-if-vlan1)# ipv6 dhcp relay remote-id abc

4.1.5 ipv6 dhcp relay remote-id option

- **Command: ipv6 dhcp relay remote-id option**
  - **no ipv6 dhcp relay remote-id option**
- **Function:** This command enables switch relay to support the option 37, the no form of this command disables it.
- **Parameters:** None.
- **Default:** Disable the relay option 37.

- **Command Mode:** Global configuration mode
- **Usage Guide:** Only after this command is configured, DHCPv6 relay agent can add option 37 in DHCPv6 request packets before sending it to server or next relay agent. Make sure that DHCPv6 service has been enabled before execute this command.
- **Example:** Enable the switch relay to support option 37.
- Switch(Config)#service dhcpv6
- Switch(Config)#ipv6 dhcp relay remote-id option

4.1.6 ipv6 dhcp relay subscriber-id

- **Command: ipv6 dhcp relay subscriber-id <subscriber-id>**
    - **no ipv6 dhcp relay subscriber-id**
- **Function:** This command is used to set the form of adding option 38 in received DHCPv6 request packets, of which <subscriber-id> is the subscriber-id in user-defined option 38 and it is a string with a length of less than 128. The no operation of this command restores subscriber-id in option 38 to vlan name together with port name such as "Vlan2+Ethernet1/0/2".
- **Parameters: subscriber-id**, user-defined content of option 38
- **Default:** Set subscriber-id in option 38 to vlan name together with port name.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Because the option 38 information added by switch may associate with third-party DHCPv6 servers, users can specify the subscriber-id content based on server condition when standard subscriber-id of the switch cannot satisfy the demand of server. The vlan name together with physical port name is used as the subscriber-id in option 38 by default.
- **Example:** Enable abc as the subscriber-id of DHCPv6 option 38.
- Switch(Config-if-vlan1)# ipv6 dhcp relay subscriber-id abc

4.1.7 ipv6 dhcp relay subscriber-id option

- **Command: ipv6 dhcp relay subscriber-id option**
    - **no ipv6 dhcp relay subscriber-id option**
- **Function:** This command enables switch relay to support the option 38, the no form of this command disables it.
- **Parameters:** None.
- **Default:** Disable the relay option 38.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Only after this command is configured, DHCPv6 relay agent can add option 38 in DHCPv6 request packets before sending it to server or next relay agent. Make sure that DHCPv6 service has been enabled before execute this command. The option 38 of switch relay is disabled by default.
- **Example:** Enable the switch relay to support option 38.
- Switch(Config)#service dhcpv6
- Switch(Config)#ipv6 dhcp relay subscriber-id option

4.1.8 ipv6 dhcp relay subscriber-id select delimiter

- **Command: ipv6 dhcp relay subscriber-id select (sp | sv | pv | spv) delimiter WORD (delimiter WORD |)**
    - **no ipv6 dhcp relay subscriber-id select delimiter**
- **Function:** Configures user configuration options to generate subscriber-id. The no form of this command restores to its original default configuration, i.e. vlan name together with port name.
- **Parameters:** (**sp | sv | pv | spv**): a selection in combinations of slot, port and vlan, among which **sp** represents slot and port, **sv** represents slot and vlan, **pv** represents port and vlan, and **spv** represents slot, port and vlan.
    - **WORD**: the delimiter between slot, port and vlan which ranges among (#|.|,|;|:|/|space). Note that there're two **delimiter WORDs** here, of which the former is the delimiter between slot and port and the latter is the one between port and vlan.
- **Default:** Null.
- **Command Mode:** Global configuration mode
- **Usage Guide:** The command has no effect on ports with self-defined subscriber-id. If user redefines the subscriber-id of the port after using the command, the user-defined one prevails. This configuration is null by default.
- **Example:**
- Switch(config)# ipv6 dhcp relay subscriber-id select sp delimiter #

4.1.9 ipv6 dhcp server remote-id option

- **Command: ipv6 dhcp server remote-id option**
    - **no ipv6 dhcp server remote-id option**
- **Function:** This command enables DHCPv6 server to support the identification of option 37, the no form of this command disables it.
- **Parameters:** None.
- **Default:** Do not support option 37.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Configure this command if option 37 options is expected to be identified and processed by DHCPv6 server, otherwise they will be ignored. Option 37 is not supported by default.
- **Example:** Enable the DHCPv6 server to support option 37.
- Switch(Config)# ipv6 dhcp server remote-id option

4.1.10 ipv6 dhcp server select relay-forw

- **Command: ipv6 dhcp server select relay-forw**
    - **no ipv6 dhcp server select relay-forw**
- **Function:** This command enables the DHCPv6 server to support selections when multiple option 37 or option 38 options exist and the option 37 and option 38 of relay-forw in the innermost layer are

selected. The no operation of it restores the default configuration, i.e. selecting option 37 and option 38 of the original packets.

- **Parameters:** None.
- **Default:** Selecting option 37 and option 38 of the original packets.
- **Command Mode:** Interface configuration mode
- **Usage Guide:** Make sure that the server has been enabled to support option 37 and option 38 before use this command. The system selects option 37 and option 38 of the original packets by default.
- **Example:** Configure that the vlan1 interface of DHCPv6 server selects option 37 and option 38 of relay-forw in the innermost layer.
- Switch(Config-if-vlan1)# ipv6 dhcp server select relay-forw

4.1.11 ipv6 dhcp server subscriber-id option

- **Command: ipv6 dhcp server subscriber-id option**
    - **no ipv6 dhcp server subscriber-id option**
- **Function:** This command enables DHCPv6 server to support the identification of option 38, the no operation of this command disables it.
- **Parameters:** None.
- **Default:** Do not support option 38.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Configure this command if option 38 is expected to be identified and processed by DHCPv6 server, otherwise they will be ignored. option 38 is not supported by default.
- **Example:** Enable DHCPv6 server to support option 38.
- Switch(Config)# ipv6 dhcp server subscriber-id option

4.1.12 ipv6 dhcp snooping remote-id

- **Command: ipv6 dhcp snooping remote-id *<remote-id>***
    - **no ipv6 dhcp snooping remote-id**
- **Function:** This command is used to set the form of adding option 37 in received DHCPv6 request packets, of which <remote-id> is the content of remote-id in user-defined option 37 and it is a string with a length of less than 128. The no form of this command restores remote-id in option 37 to enterprise-number together with vlan MAC address.
- **Parameters: remote-id,** user-defined content of option 37.
- **Default:** Using vlan MAC address as remote-id content by default such as "00-01-ac-12-23" with '-' hyphen.
- **Command Mode:** Port mode
- **Usage Guide:** Because option 37 information added by switch may associate with third-party DHCPv6 servers, users can specify remote-id content based on server condition when standard remote-id of the switch cannot satisfy the demand of server. The enterprise-number together with vlan MAC address is used as the remote-id by default.
- **Example:** Enable abc as remote-id of DHCPv6 option 37.

- Switch(Config-if-Ethernet1/0/1)# ipv6 dhcp snooping remote-id abc

4.1.13 ipv6 dhcp snooping remote-id option

- **Command: ipv6 dhcp snooping remote-id option**
    - **no ipv6 dhcp snooping remote-id option**
- **Function:** This command enables DHCPv6 SNOOPING to support option 37, the no form of this command disables it.
- **Parameters:** None.
- **Default:** Disable.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Only after this command is configured, DHCPv6 SNOOPING can add option 37 in DHCPv6 packets before sending it to server or relay agent. Make sure that DHCPv6 SNOOPING has been enabled before execute this command. The system disables option 37 of DHCPv6 SNOOPING by default.
- **Example:** Enable option 37 in DHCPv6 SNOOPING.
- Switch(Config)#ipv6 dhcp snooping enable
- Switch(Config)#ipv6 dhcp snooping remote-id option

4.1.14 ipv6 dhcp snooping remote-id policy

- **Command: ipv6 dhcp snooping remote-id policy {drop | keep | replace}**
    - **no ipv6 dhcp snooping remote-id policy**
- **Function:** This command is used to configure the reforward policy of the system when receiving DHCPv6 packets with option 37, among which the **drop** mode means that the system simply discards it with option 37, **keep** mode means that the system keeps option 37 unchanged and forwards the packets to the server and **replace** mode means that the system replaces option 37 of current packets with its own before forwarding it to the server. The no operation of this command sets reforward policy of DHCPv6 packets with option 37 as replace.
- **Parameters:** None.
- **Default:** Using replace mode to replace option 37 of current packets with system's own.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Since DHCPv6 client packets may already include option 37 information, corresponding processing policy of DHCPv6 SNOOPING is required to develop. If the forwarding policy is set as **replace**, option 37 has to be enabled in advance. Use replace mode to replace option 37 of current packets with system's own by default.
- **Example:** Configure the reforward policy of DHCPv6 packets with option 37 as keep for DHCPv6 SNOOPING.
- Switch(Config)# ipv6 dhcp snooping remote-id policy keep

4.1.15 ipv6 dhcp snooping subscriber-id

- **Command: ipv6 dhcp snooping subscriber-id <subscriber-id>**

- ▪ **no ipv6 dhcp snooping subscriber-id**
- **Function:** This command is used to set the form of adding option 38 in received DHCPv6 request packets, of which <subscriber-id> is the content of subscriber-id in user-defined option 38 and it is a string with a length of less than 128. The no operation of this command restores subscriber-id in option 38 to vlan name together with port name such as "Vlan2+Ethernet1/0/2".
- **Parameters: subscriber-id,** user-defined content of option 38
- **Default:** Set subscriber-id in option 38 to vlan name together with port name.
- **Command Mode:** Port mode
- **Usage Guide:** Because option 38 information added by switch may associate with third-party DHCPv6 servers, users can specify subscriber-id content based on server condition when standard subscriber-id of the switch cannot satisfy the demand of server. The vlan name together with physical port name is used as subscriber-id in option 38 by default.
- **Example:** Enable abc as subscriber-id of DHCPv6 option 38.
- Switch(Config-if-Ethernet1/0/1)#ipv6 dhcp snooping subscriber-id abc

4.1.16 ipv6 dhcp snooping subscriber-id option

- **Command: ipv6 dhcp snooping subscriber-id option**
  - ▪ **no ipv6 dhcp snooping subscriber-id option**
- **Function:** This command enables DHCPv6 SNOOPING to support option 38, the no form of this command disables it.
- **Parameters:** None.
- **Default:** Disable option 38 of DHCPv6 SNOOPING.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Only after this command is configured, DHCPv6 SNOOPING can add option 38 in DHCPv6 packets before sending it to server or relay agent. Make sure that DHCPv6 SNOOPING has been enabled before executing this command. The system disables option 38 of DHCPv6 SNOOPING by default.
- **Example:** Enable option 38 in DHCPv6 SNOOPING.
- Switch(Config)#ipv6 dhcp snooping enable
- Switch(Config)#ipv6 dhcp snooping subscriber-id option

4.1.17 ipv6 dhcp snooping subscriber-id policy

- **Command: ipv6 dhcp snooping subscriber-id policy {drop | keep | replace}**
  - ▪ **no ipv6 dhcp snooping subscriber-id policy**
- **Function:** This command is used to set the reforward policy of the system when receiving DHCPv6 packets with option 38, among which the **drop** mode means that the system simply discards it with option 38, **keep** mode means that the system keeps option 38 unchanged and forwards the packets to the server and **replace** mode means that the system replaces option 38 of current packets with its own before forwarding it

to the server. The no operation of this command sets the reforward policy of DHCPv6 packets with option 38 as replace.

- **Parameters:** None.
- **Default:** Using replace mode to replace option 38 of current packets with system's own.
- **Command Mode:** Global configuration mode
- **Usage Guide:** Since DHCPv6 client packets may already include option 38 information, corresponding processing policy of DHCPv6 SNOOPING is requested to develop. If the reforward policy is set as **replace**, option 38 has to be enabled in advance. The system disables option 38 of DHCPv6 SNOOPING by default.
- **Example:** Set the reforward policy of DHCPv6 packets with option 38 as keep for DHCPv6 SNOOPING.
- Switch(Config)# ipv6 dhcp snooping subscriber-id policy keep

4.1.18 ipv6 dhcp snooping subscriber-id select delimiter

- **Command: ipv6 dhcp snooping subscriber-id select (sp | sv | pv | spv) delimiter WORD (delimiter WORD |)**
    - **no ipv6 dhcp snooping subscriber-id select delimiter**
- **Function:** Configure user configuration options to generate subscriber-id. The no form of this command restores to its original default configuration, i.e. vlan name together with port name.
- **Parameters:** (**sp | sv | pv | spv**), a selection from combinations of slot, port and vlan, among which **sp** represents slot and port, **sv** represents slot and vlan, **pv** represents port and vlan, and **spv** represents slot, port and vlan.
    - **WORD**, the delimiter between slot, port and vlan which ranges among (#|.|,|;|:|/|space). Note that there're two delimiter WORDs here, of which the former is the delimiter between slot and port while the latter is that between port and vlan.
- **Default:** Null.
- **Command Mode:** Global configuration mode
- **Usage Guide:** This command has no effect on ports with self-defined subscriber-id. If a user redefines subscriber-id of the port after configuring the command, the user-defined one prevails. This configuration is null by default.
- **Example:**
- Swithc(config)# ipv6 dhcp snooping subscriber-id select sv delimiter #

4.1.19 ipv6 dhcp use class

- **Command: ipv6 dhcp use class**
    - **no ipv6 dhcp use class**
- **Function:** This command enables DHCPv6 server to support DHCPv6 class during address assignment, the no operation of this command disables it without removing the relative DHCPv6 class information that has been configured.
- **Parameters:** None.

- **Default:** DHCPv6 server supports DHCPv6 class during address assignment.
- **Command Mode:** Global configuration mode
- **Usage Guide:** By default, DHCPv6 servers support DHCPv6 class during address assignment and the no form of this command doesn't remove DHCPv6 class information that has been configured. Make sure that DHCPv6 service has been enabled before using this command. DHCPv6 server supports DHCPv6 class during address assignment by default.
- **Example:** Configure DHCPv6 server to support DHCPv6 class during address assignment.
- Switch(Config)# ipv6 dhcp use class

4.1.20 remote-id subscriber-id

- **Command: {remote-id [*] <remote-id> [*] | subscriber-id [*] <subscriber-id> [*]}**
  - **no {remote-id [*] <remote-id> [*] | subscriber-id [*] < subscriber-id> [*]}**
- **Function:** This command configures option 37 and option 38 that match the class in IPv6 DHCP class configuration mode.
- **Parameters:** <remote-id>, a string with a length ranging from 1 to 128 bytes is used to match remote-id in option 37.
  - <subscriber-id>, a string with a length ranging from 1 to 128 bytes is used to match subscriber-id in option 38.
  - [*], match zero or more characters.
- **Default:** None.
- **Command Mode:** IPv6 DHCP Class configuration mode
- **Usage Guide:** This command configures a mode which matches with the already-defined DHCPv6 class, and a DHCPv6 class may configure multiple commands. If this command is ignored and no mode configured in IPv6 DHCP Class mode, any remote-id or subscriber-id is considered to match with the DHCPv6 class, however, remote-id or subscriber-id must exist in DHCPv6 packet.
- **Example:** Configure some remote-id or subscriber-id belonging to DHCPv6 class named CLASS1.
- Switch(Config)# ipv6 dhcp class CLASS1
- Switch(Dhcpv6-class)#remote-id abc* subscriber-id bcd*
- Switch(Dhcpv6-class)#remote-id edf*
- Switch(Dhcpv6-class)#subscriber *mmn

4.2 Commands for Monitoring and Debugging

4.2.1 debug ipv6 dhcp detail

- **Command: debug ipv6 dhcp detail**

- **Function:** Display the debug about detailed content of various packets sent and received by DHCPv6. If packets with option 37 and option 38, they will also be displayed. This command is applied in the server side as well as the relay side.
- **Parameters:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** Enable/disable the display of detailed debug about packets sent and received by DHCPv6.
- **Example:**
- Switch# debug ipv6 dhcp detail
- %Jan 01 01:38:45 2006 DHCPv6 DETAILS: contents of SOLICIT packet
- %Jan 01 01:38:45 2006   transaction-ID: 0x00b2d47c
- %Jan 01 01:38:45 2006   elapsed time option(8), option-len 2
- %Jan 01 01:38:45 2006   elapsed time: 0
- %Jan 01 01:38:45 2006   client ID option(1), option-len 14
- %Jan 01 01:38:45 2006   DUID: 00:01:00:01:0f:55:82:4f:00:19:e0:3f:d1:83
- %Jan 01 01:38:45 2006   identity association option(3), option-len 12
- %Jan 01 01:38:45 2006   IANA: 0x0e001d92, T1 0, T2 0
- %Jan 01 01:38:45 2006   vendor class option(16), option-len 14
- %Jan 01 01:38:45 2006   enterprise number : 311
- %Jan 01 01:38:45 2006   option request option(6), option-len 6
- %Jan 01 01:38:45 2006   requested-option: domain search list
- %Jan 01 01:38:45 2006   requested-option: DNS server list
- %Jan 01 01:38:45 2006   requested-option: vendor specific info
- %Jan 01 01:38:45 2006   remote-id option(37), option-len 14
- %Jan 01 01:38:45 2006   remote-id : 0x0a0b0c
- %Jan 01 01:38:45 2006   subscriber-id option(38), option-len 16
- %Jan 01 01:38:45 2006   subscriber-id : 0x0a0b0c0d

4.2.2 debug ipv6 dhcp relay packet

- **Command: debug ip dhcp relay packet**
- **Function:** Display the information of relay packet processing.
- **Parameters:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** This command is used to display the process of relay packet processed by relay agent together with the action information of option 37 and option 38.
- **Example:**
- Switch# debug ip dhcpv6 relay packet
- %May 19 16:45:34 2010 DHCPv6 RELAY PACKET: received msg0 from <fe80::211:22ff:fe33:4455> on <Vlan8>
- %May 19 16:45:34 2010 DHCPv6 RELAY PACKET: add subscriber-id option "Vlan8+Ethernet1/0/12"

4.2.3 debug ipv6 dhcp snooping packet

- **Command: debug ipv6 dhcp snooping packet**
- **Function:** Debug the packets of DHCPv6 SNOOPING. Corresponding information will also be displayed when adding or deleting option 37 and option 38.
- **Parameters:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** Enable/disable the information of DHCPv6 packets processed by DHCPv6 Snooping, including the type of received packet, source MAC and destination MAC, client DUID, i.e. the client identification, IA address, preferred lifetime, valid lifetime, and packet discard and so on.
- **Example:**
- switch#debug ipv6 dhcp snooping packet
- dhcpv6 snooping packet debug is on
- switch#%Jan 05 00:26:40 2006 DHCP6SNP EVENT: Parse packet SOLICIT from fe80::200:ff:fe00:1
- src MAC 00-00-00-00-00-01 interface Ethernet1/0/23 vlan 24
- %Jan 05 00:26:40 2006 DHCP6SNP PACKET: Receive DHCPv6 packet SOLICIT from fe80::200:ff:fe00:1
- src MAC 00-00-00-00-00-01, dst MAC 33-33-00-01-00-02,
- interface Ethernet1/0/23 vlan 24,
- transaction-ID 6137412, smac host flag 0, dmac host flag 0
- %Jan 05 00:26:40 2006 DHCP6SNP PACKET: Forward packet SOLICIT (protocol 0x37)
- %Jan 05 00:26:40 2006 DHCP6SNP PACKET: to vlan 24 except port Ethernet1/0/23 (designPort flag 0)
- %Jan 05 00:26:40 2006 DHCP6SNP PACKET: and return packet to network stack
- switch#

4.2.4 show ipv6 dhcp relay option

- **Command: show ipv6 dhcp relay option**
- **Function:** Display the configuration of system relay agent, including the enable switch for option 37 and option 38.
- **Parameters:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** Use this command to check relay agents' configuration status for option 37 and option 38.
- **Example:**
- Switch#show ipv6 dhcp relay option
- remote-id option enable
- subscriber-id option enable
- Interface Vlan 1: remote-id option configure "abc"

4.2.5 show ipv6 dhcp snooping option

- **Command: show ipv6 dhcp snooping option**
- **Function:** Display the configuration information of system snooping, including the enable switch for option 37 and option 38.
- **Parameters:** None.
- **Command Mode:** Admin mode
- **Usage Guide:** Use this command to check snooping configuration status for option 37 and option 38.
- **Example:**
- Switch#show ipv6 dhcp snooping option
- remote-id option enable
- subscriber-id option enable
- The slot port vlan select option is : port and vlan
- The delimiter is : #

Chapter 5 COMMANDS FOR DHCP SNOOPING

5.1 debug ip dhcp snooping binding

- **Command: debug ip dhcp snooping binding**
- **no debug ip dhcp snooping binding**
- **Function:** This command is use to enable the DHCP SNOOPING debug switch to debug the state of binding data of DHCP SNOOPING.
- **Command Mode:** Admin mode
- **Usage Guide:** This command is mainly used to debug the state of DHCP SNOOPING task when it adds ARP list entries, dot1x users and trusted user list entries according to binding data.

5.2 debug ip dhcp snooping event

- **Command: debug ip dhcp snooping event**
- **no debug ip dhcp snooping event**
- **Function:** This command is use to enable the DHCP SNOOPING debug switch to debug the state of DHCP SNOOPING task.
- **Command Mode:** Admin mode.
- **Usage Guide:** This command is mainly used to debug the state of DHCP SNOOPING task and available of outputting the state of checking binding data and executing port action and so on.

5.3 debug ip dhcp snooping packet

- **Command: debug ip dhcp snooping packet**
- **no debug ip dhcp snooping packet**
- **Function:** This command is used to enable the DHCP SNOOPING debug switch to debug the message-processing procedure of DHCP SNOOPING.
- **Command Mode:** Admin Mode.
- **Usage Guide:** The debug information that the DHCP SNOOPING is processing messages, including every step in the message-processing procedure: adding alarm information, adding binding information, transmitting DHCP messages, adding/peeling option 82 and etc.

5.4 debug ip dhcp snooping packet interface

- **Command: debug ip dhcp snooping packet interface {[ethernet] *<InterfaceName>*}**

- **no debug ip dhcp snooping packet {[ethernet]** *<InterfaceName>***} Function:** This command is used to enable the DHCP SNOOPING debug switch to debug the information that DHCP SNOOPING is receiving a packet.
- **Parameters:** *<InterfaceName>:* Interface name.
- **Command Mode:** Admin Mode.
- **Usage Guide:** The information that DHCP Snooping is receiving messages from a specific port.

5.5 debug ip dhcp snooping update

- **Command: debug ip dhcp snooping update**
- **no debug ip dhcp snooping update**
- **Function:** This command is use to enable the DHCP snooping debug switch to debug the communication information between DHCP snooping and helper server.
- **Command Mode:** Admin Mode.
- **Usage Guide:** Debug the information of communication messages received and sent by DHCP snooping and helper server.

5.6 enable trustview key

- **Command: enable trustview key {0 | 7}** *<password>*
- **no enable trustview key**
- **Function:** To configure DES encrypted key for private packets, this command is also the switch for the private packets encrypt and hash function enabled or not.
- **Parameter:** *<password>* is character string length less than 16, which use as encrypted key. 0 for un-encrypted text for the password, while 7 for encrypted.
- **Command Mode:** Global Mode.
- **Default:** Disabled.
- **Usage Guide:** The switch communicates with the TrustView management system through private protocols. By default these packets are not encrypted. In order to prevent spoofing, it can be configured to encrypt these packets. And at the same time, the same password should be configured on TrustView server.
- **Example:** Enable encrypt or hash function of private message.
- Switch(config)# enable trustview key 0 qtech

5.7 ip dhcp snooping

- **Command: ip dhcp snooping enable**
  - **no ip dhcp snooping enable**
- **Function:** Enable the DHCP Snooping function.
- **Parameters:** None.

- **Command Mode:** Globe mode.
- **Default Settings:** DHCP Snooping is disabled by default.
- **Usage Guide:** When this function is enabled, it will monitor all the DHCP Server packets of non-trusted ports.
- **Example:** Enable the DHCP Snooping function.
- switch(config)#ip dhcp snooping enable

5.8 ip dhcp snooping action

- **Command: ip dhcp snooping action {shutdown | blackhole} [recovery <*second*>]**
  - **no ip dhcp snooping action**
- **Function:** Set or delete the automatic defense action of a port.
- **Parameters:**
  - **shutdown:** When the port detects a fake DHCP Server, it will be shutdown.
  - **blackhole:** When the port detects a fake DHCP Server, the vid and source MAC of the fake packet will be used to block the traffic from this MAC.
  - **recovery:** Users can set to recover after the automatic defense action being executed.(no shut ports or delete correponding blackhole）.
  - **second:** Users can set how long after the execution of defense action to recover. The unit is second, and valid range is 10-3600.
- **Command Mode:** Port mode
- **Default Settings:** No default defense action.
- **Usage Guide:** Only when DHCP Snooping is globally enabled, can this command be set. Trusted port will not detect fake DHCP Server, so, will never trigger the corresponding defense action. When a port turns into a trusted port from a non-trusted port, the original defense action of the port will be automatically deleted.
- **Example:** Set the DHCP Snooping defense action of port ethernet1/0/1 as setting blackhole, and the recovery time is 30 seconds.
- switch(config)#interface ethernet 1/0/1
- switch(Config-Ethernet1/0/1)#ip dhcp snooping action blackhole recovery 30

5.9 ip dhcp snooping action MaxNum

- **Command: ip dhcp snooping action {<maxNum>|default}**
- **Function:** Set the number of defense action that can be simultaneously took effect.
- **Parameters:** <*maxNum*>: the number of defense action on each port, the range of which is 1-200, and the value of which is 10 by default.
  - **default:** recover to the default value.
- **Command Mode:** Globe mode
- **Default Settings:** The default value is 10.

- **Usage Guide:** Set the max number of defense actions to avoid the resource exhaustion of the switch caused by attacks. If the number of alarm information is larger than the set value, then the earliest defense action will be recovered forcibly in order to send new defense actions.
- **Example:** Set the number of port defense actions as 100.
- switch(config)#ip dhcp snooping action 100

5.10 ip dhcp snooping binding

- **Command: ip dhcp snooping binding enable**
    - **no ip dhcp snooping binding enable**
- **Function:** Enable the DHCP Snooping binding funciton
- **Parameters:** None.
- **Command Mode:** Globe mode
- **Default Settings:** DHCP Snooping binding is disabled by default.
- **Usage Guide:** When the function is enabled, it will record the binding information allocated by DHCP Server of all trusted ports. Only after the DHCP SNOOPING function is enabled, the binding function can be enabled.
- **Example:** Enable the DHCP Snooping binding funciton.
- switch(config)#ip dhcp snooping binding enable
- **Relative Command: ip dhcp snooping enable**

5.11 ip dhcp snooping binding arp

- **Command: ip dhcp snooping binding arp**
- **no ip dhcp snooping binding arp**
- **Function:** Enable the DHCP Snooping binding ARP funciton.
- **Parameters:** None
- **Command Mode:** Globe mode
- **Default Settings:** DHCP Snooping binding ARP funciton is disabled by default.
- **Usage Guide:** When this function is enbaled, DHCP SNOOPING will add binding ARP list entries according to binding information. Only after the binding function is enabled, can the binding ARP function be enabled. Binding ARP list entries are static entries without configuration of reservation, and will be added to the NEIGHBOUR list directly. The priority of binding ARP list entries is lower than the static ARP list entries set by administrator, so can be overwritten by static ARP list entries; but, when static ARP list entries are deleted, the binding ARP list entries can not be recovered untill the DHCP SNOOPING recapture the biding inforamtion. Adding binding ARP list entries is used to prevent these list entried from being attacked by ARP cheating. At the same time, these static list entries need no reauthenticaiton, which can prenvent the switch from the failing to reauthenticate ARP when it is being attacked by ARP scanning.

- Only after the DHCP SNOOPING binding function is enabled, the binding ARP function can be set.
- **Example:** Enable the DHCP Snooping binding ARP funciton.
- switch(config)#ip dhcp snooping binding arp
- **Relative Command: ip dhcp snooping binding enable**

5.12 ip dhcp snooping binding dot1x

- **Command: ip dhcp snooping binding dot1x**
    - **no ip dhcp snooping binding dot1x**
- **Function:** Enable the DHCP Snooping binding DOT1X funciton.
- **Parameters:** None
- **Command Mode:** Port mode
- **Default Settings:** By default, the binding DOT1X funciton is disabled on all ports.
- **Usage Guide:** When this function is enabled, DHCP SNOOPING will notify the DOT1X module about the captured bindng information as a DOT1X controlled user. This command is mutually exclusive to"ip dhcp snooping binding user-contro"command.
- Only after the DHCP SNOOPING binding function is enabled, the binding dot1x function can be set.
- **Example:** Enable the binding DOT1X funciton on port ethernet1/0/1.
- switch(config)#interface ethernet 1/0/1
- switch(Config-Ethernet 1/0/1)# ip dhcp snooping binding dot1x
- **Relative Command: ip dhcp snooping binding enable**
    - **ip dhcp snooping binding user-control**

5.13 ip dhcp snooping binding user

- **Command: ip dhcp snooping binding user *<mac>* address *<ipaddress>* vlan *<vid>* interface [Ethernet] *<ifname>***
    - **no ip dhcp snooping binding user *<mac>* interface [Ethernet] *<ifname>***
- **Function:** Configure the information of static binding users.
- **Parameters:**
    - ***<mac>*:** The MAC address of the static binding user, whic is the only index of the binding user.
    - ***<ipaddress>*:** The IP address of the static binding user.
    - <vid**>:** The VLAN ID which the static binding user belongs to.
    - ***<ifname>*:** The access interface of static binding user.
- **Command Mode:** Globe mode
- **Default Settings:** DHCP Snooping has no static binding list entry by default.
- **Usage Guide:** The static binding users is deal in the same way as the dynamic binding users captured by DHCP SNOOPING; the follwoing actions are all allowed: notifying DOT1X to be a controlled user of DOT1X, adding a trusted user list entry directly, adding

a bingding ARP list entry. The static binding uses will never be aged, and have a priority higher than dynamic binding users. Only after the DHCP SNOOPING binding function is enabled, the static binding users can be enabled.

- **Example:** Configure static binding users.
- switch(config)#ip dhcp snooping binding user 00-03-0f-12-34-56 address 192.168.1.16 interface Ethernet 1/0/16
- **Relative Command: ip dhcp snooping binding enable**

5.14 ip dhcp snooping binding user-control

- **Command: ip dhcp snooping binding user-control**
    - **no ip dhcp snooping binding user-control**
- **Function:** Enable the binding user funtion.
- **Parameters:** None.
- **Command Mode:** Port Mode.
- **Default Settings:** By default, the binding user funciton is disabled on all ports.
- **Usage Guide:** When this function is enabled, DHCP SNOOPING will treat the captured binding information as trusted users allowed to access all resources. This command is mutually exclusive to "ip dhcp snooping binding dot1x" command.
- Only after DHCP SNOOPING binding function is enabled, the binding user function can be set. This command is not limited by "ip dhcp snooping" based on VLAN, but it is only limited by the global "ip dhcp snooping enable" command.
- **Example:** Enable the binding USER funciton on port ethernet1/0/1.
- switch(config)#interface ethernet 1/0/1
- switch(Config-Ethernet 1/0/1)# ip dhcp snooping binding user-control
- **Relative Command: ip dhcp snooping binding enable**
    - **ip dhcp snooping binding dot1x**

5.15 ip dhcp snooping binding user-control max-user

- **Command: ip dhcp snooping binding user-control max-user** *<number>*
    - **no ip dhcp snooping binding user-control max-user**
- **Function:** Set the max number of users allowed to access the port when enabling DHCP Snooping binding user funciton; the no operation of this command will restore default value.
- **Parameters:** *<number>* the max number of users allowed to access the port, from 0 to 1024.
- **Command Mode:** Port Configuration Mode.
- **Default Settings:** The max number of users allowed by each port to access is 1024.
- **Usage Guide:** This command defines the max number of trust users distributed according to binding information, with **ip dhcp snooping binding user-contrl** enabled on the port. By default, the number is 1024. Considering the limited hardware

resources of the switch, the actual number of trust users distributed depends on the resource amount. If a bigger max number of users is set using this command, DHCP Snooping will distribute the binding informaiton of untrust users to hardware to be trust users as long as there is enough available resources. Otherwise, DHCP Snooping will change the distributed binging informaiton accordint to the new smaller max user number. When the number of distributed bingding informaiton entries reaches the max limit, no new DHCP will be able to become trust user or to access other network resouces via the switch.

- **Examples:** Enable DHCP Snooping binding user funtion on Port ethernet1/0/1, setting the max number of user allowed to access by Port Ethernet1/0/1 as 5.
- Switch(Config-If-Ethernet1/0/1)# ip dhcp snooping binding user-control max-user 5
- **Related Command: ip dhcp snooping binding user-control**

5.16 ip dhcp snooping information enable

- **Command: ip dhcp snooping information enable**
- **no ip dhcp snooping information enable**
- **Function:** This command will enable option 82 function of DHCP Snooping on the switch, the no operation of this command will disable that function.
- **Parameters:** None.
- **Default Settings:** Option 82 function is disabled in DHCP Snooping by default.
- **Command Mode:** Global Configuration Mode.
- **Usage Guide:** Only by implementing this command, can DHCP Snooping add standard option 82 to DHCP request messages and forward the message. The format of option1 in option 82 (Circuit ID option) is standard vlan name plus physical port name, like vlan1+ethernet1/0/12. That of option2 in option 82 (remote ID option) is CPU MAC of the switch, like 00030f023301. If a DHCP request message with option 82 options is received, DHCP Snooping will replace those options in the message with its own. If a DHCP reply message with option 82 options is received, DHCP Snooping will dump those options in the message and forward it.
- **Examples:** Enable option 82 function of DHCP Snooping on the switch.
- Switch(config)#ip dhcp snooping enable
- Switch(config)# ip dhcp snooping binding enable
- Switch(config)# ip dhcp snooping information enable

5.17 ip dhcp snooping information option allow-untrusted

- **Command: ip dhcp snooping information option allow-untrusted**
    - **no ip dhcp snooping information option allow-untrusted**
- **Function:** This command is used to set that allow untrusted ports of DHCP snooping to receive DHCP packets with option82 option. When disabling this command, all untrusted ports will drop DHCP packets with option82 option.

- **Parameter:** None.
- **Command Mode:** Global Mode
- **Default:** Drop DHCP packets with option82 option received by untrusted ports.
- **Usage Guide:** Usually the switch with DHCP snooping function connects the terminal user directly, so close allow-untrusted by default to avoid option82 option added by user privately. Please set uplink port as trust port when enabling the uplink of DHCP snooping function.
- **Example:** Enable the function that receives DHCP packets with option82.
- Switch(config)#ip dhcp snooping information option allow-untrusted

5.18 ip dhcp snooping information option delimiter

- **Command: ip dhcp snooping information option delimiter [colon | dot | slash | space]**
  - o **no ip dhcp snooping information option delimiter**
- **Function:** Set the delimiter of each parameter for suboption of option82 in global mode, no command restores the delimiter as slash.
- **Parameters:** None.
- **Default Settings:** slash ("/").
- **Command Mode:** Global mode
- **Usage Guide:** Divide parameters with the configured delimiters after users have defined them which are used to create suboption (remote-id, circuit-id) of option82 in global mode.
- **Example:** Set the parameter delimiters as dot (".") for suboption of option82.
- Switch(config)# ip dhcp snooping information option delimiter dot

5.19 ip dhcp snooping information option remote-id

- **Command: ip dhcp snooping information option remote-id {standard | *<remote-id>*}**
  - ▪ **no ip dhcp snooping information option remote-id**
- **Function:** Set the suboption2 (remote ID option) content of option 82 added by DHCP request packets (they are received by the port). The no command sets the additive suboption2 (remote ID option) format of option 82 as standard.
- **Parameters:** standard means the default VLAN MAC format. *<remote-id>* means the remote-id content of option 82 specified by users, its length can not exceed 64 characters.
- **Command Mode:** Global Mode
- **Default:** Use standard format to set remote-id.
- **Usage Guide:** The additive option 82 needs to associate with third-party DHCP server, it is used to specify the remote-id content by users when the standard remote-id format can not satisfy server's request.
- **Example:** Set the suboption remote-id of DHCP option82 as street-1-1.

- Switch(config)#ip dhcp snooping information option remote-id street-1-1

5.20 ip dhcp snooping information option self-defined remote-id

- **Command: ip dhcp snooping information option self-defined remote-id {hostname | mac | string WORD}**
  - o **no ip dhcp snooping information option self-defined remote-id**
- **Function:** Set creation method for option82, users can define the parameters of remote-id suboption by themselves.
- **Parameters: WORD** the defined character string of remote-id by themselves, the maximum length is 64.
- **Command Mode:** Global Mode
- **Default:** Using standard method.
- **Usage Guide:** After configure this command, if users do not configure ip dhcp snooping information option remote-id globally, it will create remote-id suboption for option82 according to self-defined method. For mac, use the format such as 00-02-d1-2e-3a-0d if it is filled to packets with ascii format, but hex format occpies 6 bytes. Each option will be filled to packets according to the configured order of the commands and divide them with delimiter (delimiter is **ip dhcp snooping information option delimiter** configuration).
- **Example:** Set self-defined method and character string of remote-id suboption are mac and abc respectively for option82.
- Switch(config)# ip dhcp snooping information option self-defined remote-id mac string abc

5.21 ip dhcp snooping information option self-defined remote-id format

- **Command: ip dhcp snooping information option self-defined remote-id format [ascii | hex]**
- **Function:** Set self-defined format of remote-id for snooping option82.
- **Parameters:** None.
- **Command Mode:** Global Mode
- **Default:** ascii.
- **Usage Guide:** self-defined format use ip dhcp snooping information option type self-defined remote-id to create remote-id format.
- **Example:** Set self-defined format of remote-id as hex for snooping option82.
- Switch(config)# ip dhcp snooping information option self-defined remote-id format hex

5.22 ip dhcp snooping information option self-defined subscriber-id

- **Command: ip dhcp snooping information option self-defined subscriber-id {vlan | port | id (switch-id (mac | hostname)| remote-mac) | string WORD}**

- ▪ **no ip dhcp snooping information option type self-defined subscriber-id**
- **Function:** Set creation method for option82, users can define the parameters of circute-id suboption by themselves.
- **Parameters: WORD** the defined character string of circuit-id by themselves, the maximum length is 64.
- **Command Mode:** Global Mode
- **Default:** Using standard method.
- **Usage Guide:** After configure this command, if users do not configure circuit-id on port, it will create circuit-id suboption for option82 according to self-defined method. Self-defined format of circuit-id: if self-defined subscriber-id format is ascii, the filled format of vlan such as "Vlan2", the format of port such as "Ethernet1/0/1", the format of mac and remote-mac such as "00-02-d1-2e-3a-0d". If self-defined format is hex, the filled format of vlan occupies 2 bytes, port occupies 4 bytes, a byte means slot (for chassis switch, it means slot ID, for box switch, it is 1), a byte means Module (the default is 0), two bytes means port ID beginning from 1, mac and remote-mac occupy 6 bytes. Each option will be filled to packets according to the configured order of the commands and divide them with delimiter (delimiter is **ip dhcp snooping information option delimiter** configuration).
- **Example:** Set self-defined method of circuit-id suboption as vlan, port, mac and remote-mac for option82.
- Switch(config)#ip dhcp snooping information option self-defined subscriber-id vlan port id remote-mac

5.23 ip dhcp snooping information option self-defined subscriber-id format

- **Command: ip dhcp snooping information option self-defined subscriber-id format [ascii | hex]**
- **Function:** Set self-defined format of circuit-id for snooping option82.
- **Parameters:** None.
- **Command Mode:** Global Mode
- **Default:** ascii.
- **Usage Guide:** self-defined format uses ip dhcp snooping information option type self-defined subscriber-id to create circuit-id format.
- **Example:** Set self-defined format of circuit-id as hex for snooping option82.
- Switch(config)#ip dhcp snooping information option self-defined subscriber-id format hex

5.24 ip dhcp snooping information option subscriber-id

- **Command: ip dhcp snooping information option subscriber-id {standard | *<circuit-id>*}**
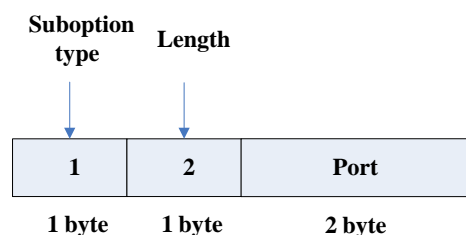 - ▪ **no ip dhcp snooping information option subscriber-id**

- **Function:** Set the suboption1 (circuit ID option) content of option 82 added by DHCP request packets (they are received by the port). The no command sets the additive suboption1 (circuit ID option) format of option 82 as standard.
- **Parameters:** standard means the standard format of VLAN name and physical port name, such as Vlan2+Ethernet1/0/12. *<circuit-id>* means the circuit-id content of option 82 specified by users, its length can not exceed 64 characters.
- **Command Mode:** Port Mode
- **Default:** Use standard format to set circuit-id.
- **Usage Guide:** The additive option 82 needs to associate with third-party DHCP server, it is used to specify the circuit-id content by user when the standard circuit-id format can not satisfy server's request.
- **Example:** Set the suboption circuit-id of DHCP option82 as P2.
- Switch(config)#ip dhcp snooping information option subscriber-id P2

5.25 ip dhcp snooping information option subscriber-id format

- **Command: ip dhcp snooping information option subscriber-id format {hex | acsii | vs-hp}**
- **Function:** This command is used to set subscriber-id format of DHCP snooping option82.
- **Parameters:** hex means that subscriber-id is VLAN and port information with hexadecimal format, acsii means that subscriber-id is VLAN and port information with ACSII format. vs-hp means that subscriber-id is compatible with the format of HP manufacturer.
- **Command Mode:** Global mode
- **Default**: ascii.
- **Usage Guide:** VLAN and port information with ASCII format, such as Vlan1+Ethernet1/0/11, VLAN and port information with hexadecimal format defined as below:

Suboption type	Length	Circuit ID type	Length	VLAN	Slot	Module	Port
1	8	0	6	VLAN	Slot	Module	Port
1 byte	1 byte	1 byte	1 byte	2 byte	1 byte	1 byte	2 byte

- VLAN field fill in VLAN ID. For chassis switch, Slot means slot number, for box switch, Slot is 1; default Module is 0; Port means port number which begins from 1.
- The compatible subscriber-id format with HP manufacturer defined as below:

Suboption type	Length	
1	2	Port
1 byte	1 byte	2 byte

- Port means port number which begins from 1.
- **Example:** Set subscriber-id format of DHCP snooping option82 as hexadecimal format.
- Switch(config)#ip dhcp snooping information option subscriber-id format hex

5.26 ip dhcp snooping limit-rate

- **Command: ip dhcp snooping limit-rate <pps>**
- **no ip dhcp snooping limit-rate**
- **Function:** Set the DHCP message rate limit
- **Parameters:** **<pps>:** The number of DHCP messages transmitted in every minute, ranging from 0 to 100. Its default value is 100. 0 means that no DHCP message will be transmitted.
- **Command Mode:** Globe mode
- **Default Settings:** The default value is 100.
- **Usage Guide:** After enabling DHCP snooping, the switch will monitor all the DHCP messages and implement software transmission. The software performance of the switch is relative to the type of the switch, its current load and so on.
- **Example:** Set the message transmission rate as 50pps.
- switch(config)#ip dhcp snooping limit-rate 50

5.27 ip dhcp snooping trust

- **Command: ip dhcp snooping trust**
  - **no ip dhcp snooping trust**
- **Function:** Set or delete the DHCP Snooping trust attributes of a port.
- **Parameters:** None
- **Command Mode:** Port mode
- **Default Settings:** By default, all ports are non-trusted ports
- **Usage Guide:** Only when DHCP Snooping is globally enabled, can this command be set. When a port turns into a trusted port from a non-trusted port, the original defense action of the port will be automatically deleted; all the security history records will be cleared (except the information in system log).
- **Example:** Set port ethernet1/0/1 as a DHCP Snooping trusted port
- switch(config)#interface ethernet 1/0/1
- switch(Config- Ethernet 1/0/1)#ip dhcp snooping trust

5.28 ip user helper-address

- **Command: ip user** *helper-address* **<svr_addr> [***port* **<udp_port>] source <src_addr> [secondary]**
    - **no ip user helper-address [secondary]**
- **Function:** Set the address and port of HELPER SERVER.
- **Parameters:**
- <svr_addr>: The IP address of HELPER SERVER IP in dotted-decimal notation.
    - udp_port: The UDP port of HELPER SERVER, the range of which is$1-65535$, and its default value is 9119.
    - src_addr: The local management IP address of the switch, in dotted-decimal notation.
    - sencondary: Whether it is a secondary SERVER address.
- **Command Mode:** Global mode
- **Default Settings:** There is no HELPER SERVER address by default.
- **Usage Guide:** DHCP SNOOPING will send the monitored binding information to HELPER SERVER to save it. If the switch starts abnormally, it can recover the binding data from HELPER SERVER. The HELPER SERVER function usually is integrated into DCBI packet. The DHCP SNOOPING and HELPER SERVER use the UDP protocol to communicate, and guarantee the arrival of retransmitted data. HELPER SERVER configuration can also be used to sent DOT1X user data from the server, the detail of usage is described in the chapter of **dot1x configuration**.
- Two HELPER SERVER addresses are allowed, DHCP SNOOPING will try to connect to PRIMARY SERVER in the first place. Only when the PRIMARY SERVER is unreachable, will the switch c HELPER SERVER connects to SECONDARY SERVER.
- **Please pay attention:** source address is the effective management IP address of the switch, if the management IP address of the switch changes, this configuration should be updated in time.
- **Example:** Set the local management IP address as 100.1.1.1, primary HELPER SERVER address as 100.1.1.100 and the port as default value.
- switch(config)#interface vlan 1
- switch(Config- If-Vlan1)#ip address 100.1.1.1 255.255.255.0
- switch(Config-if-Vlan1)exit
- switch(config)#ip user helper-address 100.1.1.100 source 100.1.1.1

5.29 ip user private packet version two

- **Command: ip user private packet version two**
    - **no ip user private packet version two**
- **Function:** The switch choose private packet version two to communicate with trustview.
- **Parameter:** None.

- **Command Mode:** Global Mode.
- **Default:** The switch choose private packet version one to communicate with DCBI.
- **Usage Guide:** If the DCBI access control system is applied, the switch should be configured to use private protocol of version one to communicate with the DCBI server. However, if TrustView is applied, version two should be applied.
- **Example:** To configure the switch choose private packet version two to communicate with inter security management background system.
- switch(config)#ip user private packet version two

5.30 show ip dhcp snooping

- **Command: show ip dhcp snooping [interface [ethernet] <*interfaceName*>]**
- **Function:** Display the current cofiguration information of dhcp snooping or display the records of defense actions of a specific port.
- **Parameters: <*interfaceName*>:** The name of the specific port.
- **Command Mode:** Admin and Global Configuration Mode.
- **Default Settings:** None.
- **Usage Guide:** If there is no specific port, then display the current cofiguration information of dhcp snooping, otherwise, display the records of defense actions of the specific port.
- **Example:**
- switch#show ip dhcp snooping
- DHCP Snooping is enabled

- DHCP Snooping binding arp: disabled
- DHCP Snooping maxnum of action info:10
- DHCP Snooping limit rate: 100(pps), switch ID: 0003.0F12.3456
- DHCP Snooping droped packets: 0, discarded packets: 0
- DHCP Snooping alarm count: 0, binding count: 0,
- expired binding: 0, request binding: 0

interface	trust	action	recovery	alarm num	bind num
Ethernet1/0/1	trust	none	0second	0	0
Ethernet1/0/2	untrust	none	0second	0	0
Ethernet1/0/3	untrust	none	0second	0	0
Ethernet1/0/4	untrust	none	0second	0	1
Ethernet1/0/5	untrust	none	0second	2	0
Ethernet1/0/6	untrust	none	0second	0	0
Ethernet1/0/7	untrust	none	0second	0	0
Ethernet1/0/8	untrust	none	0second	0	1

- Ethernet1/0/9   untrust   none   0second   0   0
- Ethernet1/0/10 untrust   none   0second   0   0
- Ethernet1/0/11 untrust   none   0second   0   0
- Ethernet1/0/12 untrust   none   0second   0   0
- Ethernet1/0/13 untrust   none   0second   0   0
- Ethernet1/0/14 untrust   none   0second   0   0
- Ethernet1/0/15 untrust   none   0second   0   0
- Ethernet1/0/16 untrust   none   0second   0   0
- Ethernet1/0/17 untrust   none   0second   0   0
- Ethernet1/0/18 untrust   none   0second   0   0
- Ethernet1/0/19 untrust   none   0second   0   0
- Ethernet1/0/20 untrust   none   0second   0   0
- Ethernet1/0/21 untrust   none   0second   0   0
- Ethernet1/0/22 untrust   none   0second   0   0
- Ethernet1/0/23 untrust   none   0second   0   0
- Ethernet1/0/24 untrust   none   0second   0   0

Displayed Information	Explanation
DHCP Snooping is enable	Whether the DHCP Snooping is globally enabled or disabled.
DHCP Snooping binding arp	Whether the ARP binding function is enabled.
DHCP Snooping maxnum of action info	The number limitation of port defense actions
DHCP Snooping limit rate	The rate limitation of receiving packets
switch ID	The switch ID is used to identify the switch, usually using the CPU MAC address.
DHCP Snooping droped packets	The number of dropped messages when the received DHCP messages exceeds the rate limit.
discarded packets	The number of discarded packets caused by the communication failure within the system. If the CPU of the switch is too busy to schedule the DHCP SNOOPING task and thus can not

	handle the received DHCP messages, such situation might happen.
DHCP Snooping alarm count:	The number of alarm information.
binding count	The number of binding information.
expired binding	The number of binding information which is already expired but has not been deleted. The reason why the expired information is not deleted immediately might be that the switch needs to notify the helper server about the information, but the helper server has not acknowledged it.
request binding	The number of REQUEST information
interface	The name of port
trust	The truest attributes of the port
action	The automatic defense action of the port
recovery	The automatic recovery time of the port
alarm num	The number of history records of the port automatic defense actions
bind num	The number of port-relative binding information.

- switch#show ip dhcp snooping int Ethernet1/0/1
- interface Ethernet1/0/1 user config:
- trust attribute: untrust
- action: none
- binding dot1x: disabled
- binding user: disabled
- recovery interval:0(s)

- Alarm info: 0

- Binding info: 0

- Expired Binding: 0

- Request Binding: 0

Displayed Information	Explanation
interface	The name of port
trust attribute	The truest attributes of the port
action	The automatic defense action of the port
recovery interval	The automatic recovery time of the port
maxnum of alarm info	The max number of automatic defense actions that can be recorded by the port
binding dot1x	Whether the binding dot1x function is enabled on the port
binding user	Whether the binding user function is enabled on the port.
Alarm info	The number of alarm information.
Binding info	The number of binding information.
Expired Binding	The expired binding information
Request Binding	REQUEST information

5.31 show ip dhcp snooping binding all

- **Command: show ip dhcp snooping binding all**
- **Function:** Display the current global binding information of DHCP snooping.
- **Parameters:** None.
- **Command Mode:** Admin and Global Configuration Mode.
- **Default Settings:** None.
- **Usage Guide:** This command can check the global binding information of DHCP snooping, each table entry includes the corresponding MAC address, IP address, port name, VLAN ID and the flag of the binding state. Besides, DHCP Snooping must be enabled globally, this command can be configured.
- **Example:**
- switch#show ip dhcp snooping binding all
- ip dhcp snooping static binding count:1169, dynamic binding count:0

- MAC   IP address   Interface   Vlan ID Flag
- --
- 00-00-00-00-11-11 192.168.40.1   Ethernet1/0/1   1   S
- 00-00-00-00-00-10 192.168.40.10   Ethernet1/0/2   1   D
- 00-00-00-00-00-11 192.168.40.11   Ethernet1/0/4   1   D
- 00-00-00-00-00-12 192.168.40.12   Ethernet1/0/4   1   D
- 00-00-00-00-00-13 192.168.40.13   Ethernet1/0/4   1   SU
- 00-00-00-00-00-14 192.168.40.14   Ethernet1/0/4   1   SU
- 00-00-00-00-00-15 192.168.40.15   Ethernet1/0/5   1   SL
- 00-00-00-00-00-16 192.168.40.16   Ethernet1/0/5   1   SL
- --
- The flag explanation of the binding state:
- S The static binding is configured by shell command
- D The dynamic binding type
- U The binding is uploaded to the server
- R The static binding is configured by the server
- DHCP response with the option82
- L The hardware drive is announced by the binding
- X Announcing dot1x module is successful
- E Announcing dot1x module is failing

5.32 show trustview status

- **Command: show trustview status**
- **Function:** To show all kinds of private packets state information, which sending or receiving from TrustView (inter security management background system).

- **Parameter:** None.
- **Command Mode:** Admin and Global Configuration Mode.
- **Default:** None.
- **Usage Guide:** This command can be used for debugging the communication messages between the switch and the TrustView server, messages such as protocol version notification, encryption negotiation, free resource and web URL redirection, and the number of forced log-off messages, as well as the number of forced accounting update messages, can be displayed.
- **Example:**
- Switch#show trustview status
- Primary TrustView Server 200.101.0.9:9119
- TrustView version2 message inform successed
- TrustView inform free resource successed
- TrustView inform web redirect address successed
- TrustView inform user binding data successed
- TrustView version2 message encrypt/digest enabled
- Key: 08:02:33:34:35:36:37:38
- Rcvd 106 encrypted messages, in which MD5-error 0 messages, DES-error 0 messages
- Sent 106 encrypted messages
- Free resource is 200.101.0.9/255.255.255.255
- Web redirect address for unauthencated users is <http://200.101.0.9:8080>
- Rcvd 0 force log-off packets
- Rcvd 19 force accounting update packets
- Using version two private packet

Chapter 6 COMMANDS FOR DHCP OPTION 60 AND OPTION 43

6.1 option 43 ascii LINE

- **Command: option 43 ascii LINE**
  - **no option 43**
- **Function:** Configure option 43 character string with ascii format in ip dhcp pool mode. The no command deletes the configured option 43.
- **Parameter:** LINE: The configured option 43 character string with ascii format, its length range between 1 and 255.
- **Default:** No option 43 character string is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** None.
- **Example:** Configure option 43 with ascii format to be "AP 1000".

- switch(config)#ip dhcp pool a
- switch (dhcp-a-config)#option 43 ascii AP 1000

6.2 option 43 hex WORD

- **Command: option 43 hex WORD**
    - **no option 43**
- **Function:** Configure option 43 character string with hex format in ip dhcp pool mode. The no command deletes the configured option 43.
- **Parameter:** WORD: The configured option 43 character string with hex format, such as a1241b.
- **Default:** No option 43 is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** When using hex method to configure option 43, the string needs to be written according to TLV (Type-Length-Value) format. For example, issue ip address of 10.1.1.1 through option 43, then the hex string here should be 01040A010101; Type=0x01, it means IP address; Length=0x04, it means the length of IP address is 4 Bytes; Value=0x0A010101, it means the hexadecimal format of 10.1.1.1.
- **Example:** Configure option 43 with hex format to be "01040a010101".
- switch(config)#ip dhcp pool a
- switch (dhcp-a-config)#option 43 hex 01040a010101

6.3 option 43 ip A.B.C.D

- **Command: option 43 ip A.B.C.D**
    - **no option 43**
- **Function:** Configure option 43 character string with IP format in ip dhcp pool mode. The no command deletes the configured option 43.
- **Parameter:** A.B.C.D: The configured option 43 with IP format, such as 192.168.1.1.
- **Default:** No option 43 is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** Using this command to configure option 43, such as "192.168.1.1", then option 43 filled in packets is "C0A80101".
- **Example:** Configure option 43 with IP format to be "192.168.1.1".
- switch(config)#ip dhcp pool a
- switch (dhcp-a-config)#option 43 ip 192.168.1.1

6.4 option 60 ascii LINE

- **Command: option 60 ascii LINE**
    - **no option 60**

- **Function:** Configure option 60 character string with ascii format in ip dhcp pool mode. The no command deletes the configured option 60.
- **Parameter:** LINE: The configured option 60 character string with ascii format, its length range between 1 and 255.
- **Default:** No option 60 character string is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** None.
- **Example:** Configure option 60 with ascii format to be "AP 1000".
- switch(config)#ip dhcp pool a
- switch (dhcp-a-config)#option 60 ascii AP 1000

6.5 option 60 hex WORD

- **Command: option 60 hex WORD**
    - **no option 60**
- **Function:** Configure option 60 character string with hex format in ip dhcp pool mode. The no command deletes the configured option 60.
- **Parameter:** WORD: The configured option 60 character string with hex format, such as a1241b.
- **Default:** No option 60 is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** None.
- **Example:** Configure option 60 with hex format to be "41502031303030".
- switch(config)#ip dhcp pool a
- switch(dhcp-a-config)#option 60 hex 41502031303030

6.6 option 60 ip A.B.C.D

- **Command: option 60 ip A.B.C.D**
    - **no option 60**
- **Function:** Configure option 60 character string with IP format in ip dhcp pool mode. The no command deletes the configured option 60.
- **Parameter:** A.B.C.D: The configured option 60 with IP format, such as 192.168.1.1.
- **Default:** No option 60 is configured.
- **Command Mode:** ip dhcp pool mode
- **Usage Guide:** Using this command to configure option 60, such as "192.168.1.1", option 60 of packets matched with the configured option 60 is "C0A80101".
- **Example:** Configure option 60 with IP format to be "192.168.1.1".
- switch(config)#ip dhcp pool a
- switch (dhcp-a-config)#option 60 ip 192.168.1.1

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