1 DHCP Commands

Command	Function
address range	Configure the network segment of a class.
address-manage	Enter the AM rule configuration mode.
bootfile	Configure the boot image file name that a DHCP server assigns to a DHCP client.
class	Configure the class associated with a DHCP address pool.
clear match ip	Clear the matching rules in AM rules.
clear ip dhcp binding	Clear the DHCP IP address binding table.
clear ip dhcp conflict	Clear DHCP address conflict records.
clear ip dhcp history	Clear historical DHCP address records.
clear ip dhcp server detect	Clear rogue DHCP server detection records.
clear ip dhcp server rate	Clear statistics about the processing rate of DHCP server packets on related modules.
clear ip dhcp server statistics	Clear statistics of a DHCP server.
clear ip dhcp relay statistics	Clear statistics of a DHCP relay agent.
client-identifier	Configure a unique DHCP client ID.
client-name	Configure a DHCP client name.
default-router	Configure the default gateway that a DHCP server assigns to a DHCP client.
dns-server	Configure the Domain Name System (DNS) server that a DHCP server assigns to a DHCP client.
domain-name	Configure the domain name that a DHCP server assigns to a DHCP client.
force-no-router	Forcibly disable gateway assignment to a DHCP client.
hardware-address	Configure a hardware address for a DHCP client.

host	Configure the IP address and network mask of a DHCP client.
ip dhcp arp-probe	Enable the ARP entry check function.
ip dhcp class	Configure a class and enter the global class configuration mode.
ip dhcp dns dynamic	Configure preferential assignment of the DNS server address obtained from an external DHCP server to clients when the device works in DHCP client or Point-to-Point Protocol over Ethernet (PPPoE) mode.
ip dhcp excluded-address	Configure excluded addresses that will not be assigned to a client by a DHCP server.
ip dhcp force-send-nak	Enable compulsory NAK reply.
ip dhcp monitor-vrrp-state	Enable Virtual Router Redundancy Protocol (VRRP) monitoring to ensure that a DHCP server processes request packets of DHCP clients only from the VRRP interface in Master state.
ip dhcp ping packets	Configure the number of times that a DHCP server pings a conflicted IP address.
ip dhcp ping timeout	Configure the timeout time of a ping operation for detecting address conflicts.
ip dhcp pool	Create a DHCP address pool and enter the DHCP address pool configuration mode.
ip dhcp refresh arp	Refresh trusted ARP entries.
ip dhcp relay check server-id	Enable the Server-ID check function so that a DHCP relay agent forwards DHCP request packets only to the DHCP server specified by the Server-ID field.
ip dhcp relay force-send-reply-pack	Enable the function of forcing a DHCP relay agent to send a reply packet.
ip dhcp relay information option82	Enable DHCP Option 82.
ip dhcp relay information option82 user-defined circuit-id	Customize the Circuit ID sub-option in DHCP Option 82.
ip dhcp relay information option82 user-defined remote-id	Customize the Remote ID sub-option in DHCP Option 82.

ip dhcp relay information option82 user-defined mac-format	Configure the format of the MAC address string in a sub-option of DHCP Option 82.
ip dhcp relay multiple-giaddr	Enable the function of configuring multiple gateway IP addresses on a DHCP relay agent.
ip dhcp relay suppression	Enable DHCP relay suppression.
ip dhcp relay source	Configure the source address of DHCP relay packets.
ip dhcp save-history-enable	Enable the function of saving historical leases to the database.
ip dhcp server arp-detect	Enable go-offline detection.
ip dhcp server detect	Enable rogue server detection.
ip dhcp smart-relay	Enable the automatic gateway switchover function.
ip dhcp use class	Enable address assignment based on class rules.
ip helper-address	Configure a DHCP server IP address globally or on an interface of a DHCP relay agent.
lease	Configure the lease time of an IP address assigned by a DHCP server to a DHCP client.
lease-threshold	Configure an alarm threshold for a DHCP address pool.
match ip	Configure an AM rule.
match ip default	Configure the default AM rule.
match ip loose	Enable the loose mode for AM rules.
netbios-name-server	Configure the NetBIOS Windows Internet Name Service (WINS) server that a DHCP server assigns to a DHCP client.
netbios-node-type	Configure the NetBIOS node type that a DHCP server assigns to a DHCP client.
network	Configure the primary network segment for dynamic assignment in a DHCP address pool.
next-server	Configure the boot server list that a DHCP server assigns to a DHCP client.
option	Define DHCP server options.
pool-status	Configure whether to enable a DHCP address pool.

relay agent information	Enter the Option 82 matching information configuration mode from the global class configuration mode.
relay-information hex	Configure Option 82 matching information.
remark	Configure identification information of a class.
service dhcp	Enable the DHCP Server or DHCP Relay function.
show ip dhcp binding	Display DHCP address binding information.
show ip dhcp conflict	Display IP address conflict records of a DHCP server.
show ip dhcp database	Display the running status of the database backup function of a DHCP server.
show ip dhcp dns dynamic	Display the DNS server address obtained from an external DHCP server when the device works in PPPoE or DHCP client mode.
show ip dhcp history	Display historical lease records.
show ip dhcp identifier	Display the address pool ID and address usage of a DHCP server.
show ip dhcp pool	Display the address pool status and utilization of a DHCP server.
show ip dhcp relay-statistics	Display statistics of a DHCP relay agent.
show ip dhcp server detect	Display the list of detected rogue servers.
show ip dhcp server statistics	Display statistics of a DHCP server.
show ip dhcp socket	Display the socket index used by a DHCP server.
update arp	Enable a DHCP server to add trusted ARP entries during address assignment.

1.1 address range

Function

Run the **address range** command to configure the network segment of a class.

Run the **no** form of this command to remove this configuration.

The default network segment of a class is the network segment of an address pool.

Syntax

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

no address range

Parameter Description

low-ip-address: Start address of a network segment.

high-ip-address: End address of a network segment.

Command Modes

Address pool class configuration mode

Usage Guidelines

This command is configured on a Dynamic Host Configuration Protocol (DHCP) server.

Each class corresponds to one network segment. Network segments are assigned in ascending order, and the network segments of multiple classes can overlap. If a class is associated with an address pool but no network segment is configured for the class, the default network segment of the class is the same as the network segment of the address pool.

Examples

The following example sets the network segment of class 1 associated with DHCP address pool mypool0 to 172.16.1.1 to 172.16.1.8.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# class class1
Hostname(config-dhcp-pool-class)# address range 172.16.1.1 172.16.1.8
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- show ip dhcp pool

1.2 address-manage

Function

Run the **address-manage** command to enter the AM rule configuration mode.

Syntax

address-manage

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server in super virtual local area network (VLAN) scenarios.

Examples

The following example enters the AM rule configuration mode.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# address-manage
Hostname(config-address-manage)#
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.3 bootfile

Function

Run the **bootfile** command to configure the boot image file name that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No boot image file name is configured by default.

Syntax

bootfile *file-name*

no bootfile

default bootfile

Parameter Description

file-name: Boot image file name.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Some DHCP clients need to download the operating system or configuration file in the boot process. A DHCP server must provide the image file name required during boot for the DHCP clients to download the file from the corresponding server, such as the Trivial File Transfer Protocol (TFTP) server. The **next-server** command is used to define the servers for boot image file download.

Examples

The following example sets the boot image file name assigned to DHCP clients with IP addresses from DHCP address pool mypool0 to **router.conf**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# bootfile router.conf
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.4 class

Function

Run the **class** command to configure the class associated with a DHCP address pool.

Run the **no** form of this command to remove this configuration.

No class is associated with a DHCP address pool by default.

Syntax

class *class-name*

no class *class-name*

Parameter Description

class-name: Class name. The value is a case-sensitive string of 1 to 64 characters.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

In each DHCP address pool, Option 82 information is used to map address segments and classify them into different classes. A DHCP address pool can be associated with multiple classes. Each class corresponds to a different network segment.

During address assignment, a DHCP server first determines an available address pool based on the network segment of a client. Then, it determines the class of the client based on Option 82, and assigns an IP address from the network segment corresponding to the class. When a request packet matches multiple classes in the address pool, the DHCP server assigns an IP address from the network segments corresponding to the classes based on the class configuration sequence. If the number of assigned IP addresses of a class reaches the limit, the DHCP server assigns an IP address based on the next matching class. Each class corresponds to one network segment. Network segments are assigned in ascending order, and the network segments of multiple classes can overlap. If a class is associated with an address pool but no network segment is configured for the class, the default network segment of the class is the same as the network segment of the address pool.

Examples

The following example associates address pool mypool0 with class 1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# class class1
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.5 clear match ip

Function

Run the **clear match ip** command to clear the matching rules in AM rules.

Syntax

clear match ip [*interface-type interface-number* | **loose**]

Parameter Description

interface-type interface-number: Interface type and interface number.

loose: Specifies the loose mode for AM rules.

Command Modes

AM rule configuration mode

Default Level

14

Usage Guidelines

If the loose mode is configured, clients that match no AM rule can obtain IP addresses in the way same as the case with no AM rule configured.

Examples

The following example clears all matching rules in AM rules.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# address-manage
Hostname(config-address-manage)# clear match ip
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.6 clear ip dhcp binding

Function

Run the **clear ip dhcp binding** command to clear the DHCP IP address binding table.

Syntax

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

Parameter Description

*: Clears all DHCP IP address binding records.

ip-address: IP address for which binding records are to be cleared.

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command can clear records of automatically bound IP addresses only. To clear records of manually bound IP addresses, run the **no ip dhcp pool** command.

Examples

The following example clears the DHCP binding table of IP address 192.168.12.100.

```
Hostname> enable
Hostname# clear ip dhcp binding 192.168.12.100
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.7 clear ip dhcp conflict

Function

Run the **clear ip dhcp conflict** command to clear DHCP address conflict records.

Syntax

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

Parameter Description

*: Clears all DHCP address conflict records.

ip-address: IP address for which conflict records are to be cleared.

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

A DHCP server uses the ping mechanism to detect address conflicts, and a DHCP client uses free Address Resolution Protocol (ARP) packets to detect address conflicts.

Examples

The following example clears all DHCP address conflict records.

```
Hostname> enable
Hostname# clear ip dhcp conflict *
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.8 clear ip dhcp history

Function

Run the **clear ip dhcp history** command to clear historical DHCP address records.

Syntax

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

Parameter Description

*: Clears all historical DHCP address records.

mac-address: MAC address for which historical DHCP address records are to be cleared.

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

A DHCP server saves information about all assigned IP addresses. This command is used to clear all historical address records.

Examples

The following example clears all historical DHCP address records.

```
Hostname> enable
Hostname# clear ip dhcp history *
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.9 clear ip dhcp server detect

Function

Run the **clear ip dhcp server detect** command to clear rogue DHCP server detection records.

Syntax

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

Parameter Description

*: Clears all rogue DHCP server detection records.

ip-address: IP address for which rogue server detection records are to be cleared.

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

A DHCP server saves addresses of detected rogue servers. This command is used to clear rogue server detection records.

Examples

The following example clears all rogue DHCP server detection records.

```
Hostname> enable
Hostname# clear ip dhcp server detect *
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.10 clear ip dhcp server rate

Function

Run the **clear ip dhcp server rate** command to clear statistics about the processing rate of DHCP server packets on related modules.

Syntax

clear ip dhcp server rate

Parameter Description

N/A

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command is used to clear statistics about the processing rate of DHCP server packets on different modules, such as ARP, hot backup, LSM, and socket.

Examples

The following example clears statistics about the processing rate of DHCP server packets on related modules.

```
Hostname> enable
Hostname# clear ip dhcp server rate
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.11 clear ip dhcp server statistics

Function

Run the **clear ip dhcp server statistics** command to clear statistics of a DHCP server.

Syntax

clear ip dhcp server statistics

Parameter Description

N/A

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Statistics of a DHCP server include the numbers of DHCP address pools, manually and automatically bound IP addresses, expired bindings, and sent and received packets of different types. This command is used to clear historical records and start new statistics collection.

Examples

The following example clears statistics of a DHCP server.

```
Hostname> enable
Hostname# clear ip dhcp server statistics
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.12 clear ip dhcp relay statistics

Function

Run the **clear ip dhcp relay statistics** command to clear statistics of a DHCP relay agent.

Syntax

clear ip dhcp relay statistics

Parameter Description

N/A

Command Modes

Privileged EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

Statistics of a DHCP relay agent include the numbers of sent and received packets of different types. This command is used to clear historical records and start new statistics collection.

Examples

The following example clears statistics of a DHCP relay agent.

```
Hostname> enable
Hostname# clear ip dhcp relay statistics
```

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.13 client-identifier

Function

Run the **client-identifier** command to configure a unique DHCP client ID.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DHCP client ID is configured by default.

Syntax

client-identifier [*unique-identifier*]

no client-identifier

default client-identifier

Parameter Description

unique-identifier: ID of a DHCP client, in hexadecimal notation with characters separated by dots (.), for example, 0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Some DHCP clients use an ID instead of a hardware address to apply for an IP address from a DHCP server. A client ID consists of the media type, Media Access Control (MAC) address, and interface name. For example, if the MAC address is 00d0.f822.33b4 and interface name is GigabitEthernet 0/1, the client identifier is

0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31. **01** indicates Ethernet, and

67.6967.6162.6974.4574.6865.726e.6574.302f.31 is the hexadecimal code of GigabitEthernet 0/1. For details about media codes, see "Address Resolution Protocol Parameters" in RFC 1700.

This command can be used only when IP addresses are statically configured.

Examples

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

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# client-identifier
0100.d0f8.2233.b467.6967.6162.6974.4574.6865.726e.6574.302f.31
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.14 client-name

Function

Run the **client-name** command to configure a DHCP client name.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DHCP client name is configured by default.

Syntax

client-name *client-name*
no client-name
default client-name

Parameter Description

client-name: Name of a DHCP client. A client name can use any standard American Standard Code for Information Interchange (ASCII) character set. A client name should not contain the domain name. For example, a DHCP client name can be set to **river** but cannot be set to **river.i-net.com.cn**.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command can be used only when IP addresses are manually bound. A client name should not contain the domain name.

Examples

The following example sets the name of a client with an IP address from DHCP address pool mypool0 to **river**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# client-name river
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.15 default-router

Function

Run the **default-router** command to configure the default gateway that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No default gateway is configured by default.

Syntax

default-router *ip-address*&<1-8>

no default-router

default default-router

Parameter Description

ip-address&<1-8>: Gateway IP address of a DHCP client. **<1-8>** indicates that up to eight gateway IP addresses can be entered, and the IP addresses are separated by spaces.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Generally, a DHCP client needs to obtain the default gateway information from a DHCP server. The DHCP server must specify at least one gateway IP address for a DHCP client, and the gateway IP address must be in the same network segment as the address assigned to the client.

Examples

The following example sets the default gateway for DHCP clients with IP addresses from DHCP address pool mypool0 to **192.168.12.1**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# default-router 192.168.12.1
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# default-router 225.2.2.2
```

```
% Error: ip address (225.2.2.2) is not valid!
```

Common Errors

- Non-unicast addresses are configured.
- More than eight valid addresses are configured.

Platform Description

N/A

Related Commands

N/A

1.16 dns-server

Function

Run the **dns-server** command to configure the Domain Name System (DNS) server that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DNS server is configured by default.

Syntax

dns-server *ip-address*&<1-8>

no dns-server

default dns-server

Parameter Description

ip-address&<1-8>: IP address of a DNS server. **<1-8>** indicates that up to eight DNS server IP addresses can be entered, and the IP addresses are separated by spaces.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When multiple DNS servers are defined, the first defined DNS server has the highest priority. A DHCP client selects the next DNS server only when it fails to communicate with the first defined DNS server.

When the device also serves as a DHCP client, it can transfer the obtained DNS server information to another DHCP client.

Examples

The following example sets the DNS server IP address for DHCP clients with addresses from DHCP address pool mypool0 to **192.168.12.3**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# dns-server 192.168.12.3
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# dns-server 225.2.2.2
% Error: ip address (225.2.2.2) is not valid!
```

Common Errors

- Non-unicast addresses are configured.
- More than eight valid addresses are configured.

Related Commands

N/A

1.17 domain-name

Function

Run the **domain-name** command to configure the domain name that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No domain name is configured by default.

Syntax

domain-name *domain-name*

no domain-name

default domain-name

Parameter Description

domain-name: Domain name of a DHCP client.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

After a DHCP client obtains a specified domain name, it can directly use its host name to access a host whose name contains the same domain name.

Examples

The following example sets the domain name assigned to DHCP clients with addresses from DHCP address pool mypool0 to **i-net.com.cn**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# domain-name i-net.com.cn
```

Notifications

When a domain name is configured for a DHCP client, the following notification will be displayed:

```
Hostname(dhcp-config)# domain-name Hostname.com.cn
```

Common Errors

N/A

Related Commands

N/A

1.18 force-no-router

Function

Run the **force-no-router** command to forcibly disable gateway assignment to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

A DHCP server assigns a gateway to a DHCP client by default.

Syntax

force-no-router

no force-no-router

default force-no-router

Parameter Description

N/A

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Examples

The following example forcibly disable gateway assignment to DHCP clients with addresses from DHCP address pool mypool0.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# force-no-router
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.19 hardware-address

Function

Run the **hardware-address** command to configure a hardware address for a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DHCP client hardware address is configured by default.

Syntax

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

no hardware-address

default hardware-address

Parameter Description

hardware-address: MAC address of a DHCP client.

type: Hardware platform protocol of a DHCP client. The value can be a character string or number. Character string options include **ethernet** and **ieee802**. Number options include **1** (10M Ethernet) and **6** (IEEE 802). If no option is defined, the default option is **ethernet**.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command can be used only when IP addresses are manually bound.

Examples

The following example sets the MAC address of a DHCP client with an address from DHCP address pool mypool0 to **00d0.f838.bf3d**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# hardware-address 00d0.f838.bf3d
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.20 host

Function

Run the **host** command to configure the IP address and network mask of a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No IP address or network mask is configured for a DHCP client by default.

Syntax

host *ip-address* [*netmask*]

no host

default host

Parameter Description

ip-address: IP address of a DHCP client host.

netmask: Network mask of a DHCP client host.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

If no network mask is defined, the DHCP server uses the natural mask of the IP address as the network mask. The natural mask is 255.0.0.0 for class A addresses, 255.255.0 for class B addresses, and 255.255.255.0 for class C addresses.

This command can be used only when IP addresses are manually bound.

Examples

The following example sets the IP address and network mask of a DHCP client with an address from DHCP address pool mypool0 to **192.168.12.91** and **255.255.255.240**, respectively.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# host 192.168.12.91 255.255.255.240
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# host 225.2.2.2 255.0.0.0
% Error: ip address 225.2.2.2 is not valid!
```

Common Errors

- An invalid address is configured.

Related Commands

N/A

1.21 ip dhcp arp-probe

Function

Run the **ip dhcp arp-probe** command to enable the ARP entry check function.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

The ARP entry check function is disabled by default.

Syntax

ip dhcp arp-probe

no ip dhcp arp-probe

default ip dhcp arp-probe

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

The ARP entry check function can be used with the ping mechanism to detect IP address conflicts and prevent IP address conflicts with clients configured with static IP addresses. If a client configured with a static IP address exists and L2 isolation is configured in an environment and the ping mechanism for IP address conflict detection becomes invalid (for example, a firewall is enabled on the client), this IP address may be assigned to another client that dynamically applies for an address, resulting in an IP address conflict.

The ARP entry check function can be enabled only in the preceding scenario. If ARP attacks exist, this function cannot be enabled. Otherwise, the DHCP address assignment service is affected. As a result, it takes a long time for a client to apply for an IP address or a client cannot apply for an IP address.

Examples

The following example enables the ARP entry check function.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp arp-probe
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.22 ip dhcp class

Function

Run the **ip dhcp class** command to configure a class and enter the global class configuration mode.

Run the **no** form of this command to remove this configuration.

No class is configured by default.

Syntax

ip dhcp class *class-name*

no ip dhcp class *class-name*

Parameter Description

class-name: Class name. The value is a case-sensitive string of 1 to 64 characters.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

After this command is executed, the system enters the global class configuration mode. In this configuration mode, you can configure Option 82 and the identifier of a class.

Examples

The following example configures a global class named **myclass** and enters the global class configuration mode.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp class myclass
Hostname(config-dhcp-class)#
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.23 ip dhcp dns dynamic

Function

Run the **ip dhcp dns dynamic** command to configure preferential assignment of the DNS server address obtained from an external DHCP server to clients when the device works in DHCP client or Point-to-Point Protocol over Ethernet (PPPoE) mode.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

Preferential assignment of the DNS server address obtained from an external DHCP server is not configured by default.

Syntax

ip dhcp dns dynamic

no ip dhcp dns dynamic

default ip dhcp dns dynamic

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When the device works in PPPoE or DHCP client mode, a DNS server address can be automatically obtained from an external DHCP server and be configured on the DHCP server of the local device, so that users do not need to perform DNS configuration. When the device serves as a DHCP server, it preferentially assigns clients with the DNS server address obtained from the external DHCP server.

Examples

The following example preferentially assigns the DNS server address obtained from an external DHCP server to clients when the device works in PPPoE or DHCP client mode.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp dns dynamic
```

Notifications

N/A

Common Errors

When the device works in PPPoE or DHCP client mode, it does not obtain a DNS server address from an external DHCP server.

Platform Description

N/A

Related Commands

N/A

1.24 ip dhcp excluded-address

Function

Run the **ip dhcp excluded-address** command to configure excluded addresses that will not be assigned to a client by a DHCP server.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No excluded IP address is configured by default. A DHCP server assigns all addresses from an IP address pool to DHCP clients.

Syntax

ip dhcp excluded-address *low-ip-address* [*high-ip-address*]

no ip dhcp excluded-address *low-ip-address* [*high-ip-address*]

default ip dhcp excluded-address *low-ip-address* [*high-ip-address*]

Parameter Description

low-ip-address: Excluded IP address or the start IP address of an excluded IP address range.

high-ip-address: End address of an excluded IP address range. The default value is the address defined by the *low-ip-address* parameter.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

If no excluded IP address is configured, a DHCP server assigns all IP addresses from an IP address pool to DHCP clients. This command is used to reserve some IP addresses for specific hosts and prevent these addresses being assigned to other DHCP clients. Excluded IP addresses help a DHCP server shorten the time for detecting IP address conflicts during address assignment.

Examples

The following example sets an excluded address range to 192.168.12.100 to 192.168.12.150.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp excluded-address 192.168.12.100 192.168.12.150
```

Notifications

When an invalid excluded address is configured, the following notification will be displayed:

```
Hostname(config)# ip dh excluded-address 225.1.1.1
% Error: Ip address 225.1.1.1 or 225.1.1.1 is not valid!
```

When a non-existent excluded address is deleted, the following notification will be displayed:

```
Hostname(config)# no ip dhcp excluded-address 20.1.1.1
% Range [20.1.1.1, 20.1.1.1] is not in the database.
```

Common Errors

- An invalid excluded address is configured.
- A non-existent excluded address is deleted.

Platform Description

N/A

Related Commands

N/A

1.25 ip dhcp force-send-nak

Function

Run the **ip dhcp force-send-nak** command to enable compulsory NAK reply.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

Compulsory NAK reply is enabled by default.

Syntax

ip dhcp force-send-nak

no ip dhcp force-send-nak

default ip dhcp force-send-nak

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

A DHCP client preferentially applies for the previously used IP address after a restart. The DHCP client sends a DHCP REQUEST packet to renew the IP address lease. If the IP address is unavailable, the DHCP server sends an NAK packet for the client to re-send a DHCP DISCOVER packet to apply for a new IP address. If the corresponding IP address lease record does not exist on the DHCP server, the client sends DHCP REQUEST packet repeatedly until the request times out. In wireless applications, compulsory NAK reply is provided for clients to re-send DHCP DISCOVER packets to apply for IP addresses quickly.

Examples

The following example disables compulsory NAK reply.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# no ip dhcp force-send-nak
```

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.26 ip dhcp monitor-vrrp-state

Function

Run the **ip dhcp monitor-vrrp-state** command to enable Virtual Router Redundancy Protocol (VRRP) monitoring to ensure that a DHCP server processes request packets of DHCP clients only from the VRRP interface in Master state.

Run the **no** form of this command to disable this feature. In this case, a DHCP server processes all DHCP request packets.

Run the **default** form of this command to restore the default configuration.

VRRP monitoring is disabled for an interface by default.

Syntax

ip dhcp monitor-vrrp-state

no ip dhcp monitor-vrrp-state

default ip dhcp monitor-vrrp-state

Parameter Description

N/A

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command can be configured only on L3 interfaces.

For an interface configured with a VRRP address and VRRP monitoring, a DHCP server processes request packets of DHCP clients only from the interface in Master state and discards other packets. If no VRRP address is configured, the DHCP server does not monitor the VRRP status and processes all DHCP request packets.

Examples

The following example enables VRRP monitoring to ensure that a DHCP server processes request packets of DHCP clients only from the VRRP interface in Master state.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface vlan 1
Hostname(config-if-VLAN 1)# ip dhcp monitor-vrrp-state
```

Notifications

When VRRP monitoring is configured on an L2 interface, the following notification will be displayed:

```
Hostname(config-if-GigabitEthernet 0/2)# ip dhcp monitor-vrrp-state
% Invalid input detected at '^' marker.
```

Common Errors

- VRRP monitoring is configured on an L2 interface.

Platform Description

N/A

Related Commands

N/A

1.27 ip dhcp ping packets

Function

Run the **ip dhcp ping packets** command to configure the number of times that a DHCP server pings a conflicted IP address.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

A DHCP server pings a conflicted IP address two times by default.

Syntax

ip dhcp ping packets [*ping-times*]

no ip dhcp ping packets

default ip dhcp ping packets

Parameter Description

Ping-times: Number of times that a DHCP server pings a conflicted IP address. The value range is from 0 to 10. The value **0** indicates that the ping operation is disabled.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When a DHCP server attempts to assign an IP address from a DHCP address pool, it uses the ping mechanism to check whether the IP address is occupied by another host. If yes, the DHCP server records the IP address. If not, the DHCP server assigns the IP address to a DHCP client.

Examples

The following example sets the number of times that a DHCP server pings a conflicted IP address to **3**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp ping packets 3
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.28 ip dhcp ping timeout

Function

Run the **ip dhcp ping timeout** command to configure the timeout time of a ping operation for detecting address conflicts.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default timeout time of a ping operation for detecting address conflicts is 500 ms.

Syntax

ip dhcp ping timeout *time*

no ip dhcp ping timeout

default ip dhcp ping timeout

Parameter Description

time: Duration that a DHCP server waits for a ping operation response, in milliseconds. The value range is from 100 to 10000.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Examples

The following example sets the timeout time of a ping operation for detecting address conflicts to 600 ms.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp ping timeout 600
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.29 ip dhcp pool

Function

Run the **ip dhcp pool** command to create a DHCP address pool and enter the DHCP address pool configuration mode.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DHCP address pool is configured by default.

Syntax

ip dhcp pool *pool-name*

no ip dhcp pool *pool-name*

default ip dhcp pool *pool-name*

Parameter Description

pool-name: Address pool name.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command is used to enter the DHCP address pool configuration mode. In DHCP address pool configuration mode, you can configure the IP address range, DNS server address, and default gateway.

Examples

The following example creates a DHCP address pool named **mypool0** and enters the DHCP address pool configuration mode.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)#
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

- **show ip dhcp pool**

1.30 ip dhcp refresh arp

Function

Run the **ip dhcp refresh arp** command to refresh trusted ARP entries.

Syntax

ip dhcp refresh arp

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

After this command is executed, a DHCP server refreshes trusted ARP entries only for clients assigned with addresses from an address pool that has the **update arp** command configured.

Examples

The following example refreshes trusted ARP entries.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp refresh arp
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.31 ip dhcp relay check server-id

Function

Run the **ip dhcp relay check server-id** command to enable the **Server-ID** check function so that a DHCP relay agent forwards DHCP request packets only to the DHCP server specified by the **Server-ID** field.

Run the **no** form of this command to disable this feature.

The **Server-ID** check function is disabled by default.

Syntax

ip dhcp relay check server-id

no ip dhcp relay check server-id

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

In a DHCP relay application environment, multiple DHCP servers are configured for each network device to provide server backup, thereby ensuring normal network operation. When a DHCP client has selected a DHCP server to send a DHCP REQUEST packet, a **Server-ID** option is carried in the packet. To reduce server load in specific environments, enable the **Server-ID** check function on the DHCP relay agent, so as to send the DHCP REQUEST packet to a DHCP server specified in this option.

In this case, the DHCP relay agent sends DHCP request packets only to the specified server. If this function is not configured, the DHCP relay agent sends DHCP request packets to all configured DHCP servers.

Examples

The following example enables the **Server-ID** check function.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay check server-id
```

The following example disables the **Server-ID** check function.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# no ip dhcp relay check server-id
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.32 ip dhcp relay force-send-reply-pack

Function

Run the **ip dhcp relay force-send-reply-pack** command to enable the function of forcing a DHCP relay agent to send a reply packet.

Run the **no** form of this command to disable this feature.

The function of forcing a DHCP relay agent to send a reply packet is disabled by default.

Syntax

ip dhcp relay force-send-reply-pack

no ip dhcp relay force-send-reply-pack

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

After the function of forcing a DHCP relay agent to send a reply packet is enabled, a DHCP relay agent forcibly specifies a gateway interface to send a reply packet if it fails to find a MAC address egress. When this command is not configured, the DHCP relay agent discards packets if it fails to find a MAC address egress.

Examples

The following example enables the function of forcing a DHCP relay agent to send a reply packet.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay force-send-reply-pack
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.33 ip dhcp relay information option82

Function

Run the **ip dhcp relay information option82** command to enable DHCP Option 82.

Run the **no** form of this command to disable this feature.

DHCP Option 82 is disabled by default.

Syntax

ip dhcp relay information option82

no ip dhcp relay information option82

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

When this function is enabled and the device serves as a DHCP relay agent, the device adds Option 82 to a DHCP request packet to be forwarded to a DHCP server. The encapsulation format of **Circuit ID** is "slot(1):port(1):dev_name(<=64)" and that of Remote ID is "user_mac(6):iftype(1):port_name(<=64):vid(2)".

Examples

The following example enables DHCP Option 82.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay information option82
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.34 ip dhcp relay information option82 user-defined circuit-id

Function

Run the **ip dhcp relay information option82 user-defined circuit-id** command to customize the **Circuit ID** sub-option in DHCP Option 82.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

Customization of **Circuit ID** in DHCP Option 82 is disabled by default.

Syntax

ip dhcp relay information option82 user-defined circuit-id *circuit-id-text*

no ip dhcp relay information option82 user-defined circuit-id

default ip dhcp relay information option82 user-defined circuit-id

Parameter Description

circuit-id-text: User-defined **Circuit ID** content. The value is a case-sensitive string of 1 to 255 characters.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

When DHCP Option 82 is enabled in user-defined mode, this command is used to customize **Circuit ID** in Option 82.

When defining the format of Option 82, you can use the keywords described in the following table. The format string behind the keywords can be set to the hexadecimal encapsulation format, ASCII encapsulation format, or hexadecimal and ASCII hybrid encapsulation format.

Table 1-1Circuit ID Format String

Keyword	Name	Format			Description
		ASCII	Hexadecimal	Number of Occupied Hexadecimal Bytes	
hostname	Host name	√	×	-	Example: Hostname
devicename	Device model	√	×	-	Example: S5750C-48GT4XS-H
portname	Interface name	√	×	-	Example: GigabitEthernet 0/1
portsname	Interface name abbreviation	√	×	-	Example: Te0/2.5
porttype	Interface type	√	√	1 B	Example: ● When ASCII is used to represent 1, the padding value is **0x31**. ● When hexadecimal is used to represent 1, the padding value is **0x01**.
sysmac	Interface MAC address	√	√	6 B	Example: ● ASCII: 2222.2222.2222 ● Hexadecimal: 0x22 0x22 0x22 0x22 0x22 0x22
slot	Slot ID	√	√	1 B	Example: ● When ASCII is used to represent 0, the padding value is **0x30**. ● When hexadecimal is used to represent 0, he padding value is **0x00**.
port	Port number	√	√	1 B	Example: ● When ASCII is

Keyword	Name	Format			Description
		ASCII	Hexadecimal	Number of Occupied Hexadecimal Bytes	
					used to represent 2, the padding value is **0x32**. ● When hexadecimal is used to represent 2, the padding value is **0x02**.
subport	Sub-port number	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
svlan	Outer VLAN	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
cvlan	Inner VLAN	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
length	Length of content	×	√	1 B	Example:

Keyword	Name	Format			Description
		ASCII	Hexadecimal	Number of Occupied Hexadecimal Bytes	
	following the length keyword				When hexadecimal is used to represent 5, the padding value is **0x05**.

Note: √ indicates that a keyword supports the corresponding encapsulation format, × indicates that a keyword does not support the corresponding encapsulation format, and - indicates meaningless.

Special characters are described as follows:

- % followed by keywords defined above indicates the format of the keywords. When the percent symbol (%) needs to be contained in the input string, enter %%, which will be converted into a single common percent symbol (%) during parsing.
- The backslash (\) indicates an escape character, and the special character following the backslash (\) indicates the special character itself. For example, \\ indicates the backslash (\) and \" indicates the quotation mark (").
- The double quotation marks ("") indicate that data enclosed is encapsulated in string format. Data without or outside the double quotation marks is encapsulated in hexadecimal format.
- Strings in ASCII format can contain 0 to 9, a to z, A to Z, and the following symbols: !, @, #, $, %, ^, &, *, (), _, +, |, -, =, \, [], {}, ;, :, '", /, ?, ., ,, <>, `.
- For characters %\" in ASCII format, add the prefix (\) in front of the characters. In ASCII format, only keywords and several specific symbols are converted and other data remains unchanged.
- If there is no escape character '\' in front of '%' in configuration commands, the key value in the information field must be added behind. Otherwise, the configuration is incorrect and an error is prompted. If the character '\' needs to be configured, enter "\\".
- For strings in hexadecimal format, digits are encapsulated into Option 82 directly in hexadecimal notation. When hexadecimal data is used, strings begin with 0X or 0x. When the number of valid characters in the hexadecimal data is an odd, add one 0 to the frontmost. When decimal data is used, the data ranges from 0 to 255 and occupies one byte. You can use spaces to enter multiple pieces of decimal data consecutively.
- Blank characters in hexadecimal notation are ignored.
- If the user-defined mode is configured but no corresponding user-defined format is configured, each sub-option of Option 82 is padded in standard mode.

Examples

The following example sets the content of **Circuit ID** in Option 82 to *host name-interface name*.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay information option82 user-defined circuit-id
"%hostname-%portname"
```

Notifications

N/A

Common Errors

The user-defined string does not meet configuration requirements.

Platform Description

N/A

Related Commands

N/A

1.35 ip dhcp relay information option82 user-defined remote-id

Function

Run the **ip dhcp relay information option82 user-defined remote-id** command to customize the **Remote ID** sub-option in DHCP Option 82.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

No custom information is configured for **Remote ID** of DHCP Option 82 by default.

Syntax

ip dhcp relay information option82 user-defined remote-id *remote-id-text*

no ip dhcp relay information option82 user-defined remote-id

default ip dhcp relay information option82 user-defined remote-id

Parameter Description

remote-id-text: User-defined **Remote ID** content. The value is a string of 1 to 255 characters.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

When DHCP Option 82 is enabled in user-defined mode, this command is used to customize **Remote ID** in Option 82.

When defining the format of Option 82, you can use the keywords described in the following table. The format string behind the keywords can be set to the hexadecimal encapsulation format, ASCII encapsulation format, or hexadecimal and ASCII hybrid encapsulation format.

Table 1-1Remote ID Format String

Keyword	Name	Format			Description
		ASCII	Hexadecimal	Number of Occupied Hexadecimal Bytes	
hostname	Host name	√	×	-	Example: Hostname
devicename	Device model	√	×	-	Example: S5750C-48GT4XS-H
portname	Interface name	√	×	-	Example: GigabitEthernet 0/1
portsname	Interface name abbreviation	√	×	-	Example: Te0/2.5
porttype	Interface type	√	√	1 B	Example: ● When ASCII is used to represent 1, the padding value is **0x31**. ● When hexadecimal is used to represent 1, the padding value is **0x01**.
sysmac	Interface MAC address	√	√	6 B	Example: ● ASCII: 2222.2222.2222 ● Hexadecimal: 0x22 0x22 0x22 0x22 0x22 0x22
slot	Slot ID	√	√	1 B	Example: ● When ASCII is used to represent 0, the padding value is **0x30**. ● When hexadecimal is used to represent 0, he padding value is **0x00**.
port	Port number	√	√	1 B	Example: ● When ASCII is used to represent 2, the padding

Keyword	Name	Format			Description
		ASCII	Hexadecimal	Number of Occupied Hexadecimal Bytes	
					value is **0x32**. ● Hexadecimal: 2. The padding value is **0x02**.
subport	Sub-port number	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
svlan	Outer VLAN	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
cvlan	Inner VLAN	√	√	2 B	Example: ● When ASCII is used to represent 5, the padding value is **0x35**. ● When hexadecimal is used to represent 5, the padding value is **0x0005**.
length	Length of content following the length keyword	×	√	1 B	Example: When hexadecimal is used to represent 5, the padding value is **0x05**.

Note: √ indicates that a keyword supports the corresponding encapsulation format, × indicates that a keyword does not support the corresponding encapsulation format, and - indicates meaningless.

Special characters are described as follows:

- % followed by keywords defined above indicates the format of the keywords. When the percent symbol (%) needs to be contained in the input string, enter %%, which will be converted into a single common percent symbol (%) during parsing.
- The backslash (\) indicates an escape character, and the special character following the backslash (\) indicates the special character itself. For example, \\ indicates the backslash (\) and \" indicates the quotation mark (").
- The double quotation marks ("") indicate that data enclosed is encapsulated in string format. Data without or outside the double quotation marks is encapsulated in hexadecimal format.
- Strings in ASCII format can contain 0 to 9, a to z, A to Z, and the following symbols: !, @, #, $, %, ^, &, *, (), _, +, |, -, =, \, [], {}, ;, :, '", /, ?, ., ,, <>, `.
- For characters %\" in ASCII format, add the prefix (\) in front of the characters. In ASCII format, only keywords and several specific symbols are converted and other data remains unchanged.
- If there is no escape character '%' in front of '%' in configuration commands, the key value in the information field must be added behind. Otherwise, the configuration is incorrect and an error is prompted. If the character '\' needs to be configured, enter "\\".
- For strings in hexadecimal format, digits are encapsulated into Option 82 directly in hexadecimal notation. When hexadecimal data is used, strings begin with 0X or 0x. When the number of valid characters in the hexadecimal data is an odd, add one 0 to the frontmost. When decimal data is used, the data ranges from 0 to 255 and occupies one byte. You can use spaces to enter multiple pieces of decimal data consecutively.
- Blank characters in hexadecimal notation are ignored.
- If the user-defined mode is configured but no corresponding user-defined format is configured, each sub-option of Option 82 is padded in standard mode.

Examples

The following example sets the content of **Remote ID** in Option 82 to *host name-interface name*.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay information option82 user-defined remote-id
"%hostname-%portname"
```

Notifications

N/A

Common Errors

The user-defined string does not meet configuration requirements.

Platform Description

N/A

Related Commands

N/A

1.36 ip dhcp relay information option82 user-defined mac-format

Function

Run the **ip dhcp relay information option82 user-defined mac-format** command to configure the format of the MAC address string in a sub-option of DHCP Option 82.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default MAC address format is H.H.H.

Syntax

ip dhcp relay information option82 user-defined mac-format *mac-format-type*

no ip dhcp relay information option82 user-defined mac-format

default ip dhcp relay information option82 user-defined mac-format

Parameter Description

mac-format-type: Format of the MAC address string in user-defined mode. The value range is from 0 to 2, and the default value is **0**. **0** indicates the H.H.H format, **1** indicates the H-H-H format, and **2** indicates the H:H:H:H:H:H format.

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

When DHCP Option 82 is enabled in user-defined mode, this command is used to convert keyword **%sysmac** in ASCII encapsulation format in a sub-option of Option 82 to a MAC address string in corresponding format.

Examples

The following example sets the format of the MAC address string in a sub-option of DHCP Option 82 to H-H-H.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay information option82 user-defined mac-format 1
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.37 ip dhcp relay multiple-giaddr

Function

Run the **ip dhcp relay multiple-giaddr** command to enable the function of configuring multiple gateway IP addresses on a DHCP relay agent.

Run the **no** form of this command to disable this feature.

The function of configuring multiple gateway IP addresses on a DHCP relay agent is disabled by default.

Syntax

ip dhcp relay multiple-giaddr

no ip dhcp relay multiple-giaddr

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

After the function of configuring multiple gateway IP addresses is enabled, a DHCP relay agent can use multiple interface IP addresses to send address applications to a DHCP server. Generally, the primary IP address is used as the gateway IP address, and the DHCP server assigns a network segment based on the gateway IP address. When a client fails to apply for an IP address over the gateway by using the primary IP address, it applies for an IP address over the gateway by using a secondary IP address.

After the automatic gateway switchover function is enabled, the DHCP relay agent adds another address to the **giaddr** field if it does to receive a reply packet for three consecutive DISCOVER packets.

Examples

The following example enables the function of configuring multiple gateway IP addresses on a DHCP relay agent.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp relay multiple-giaddr
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.38 ip dhcp relay suppression

Function

Run the **ip dhcp relay suppression** command to enable DHCP relay suppression.

Run the **no** form of this command to disable this feature.

DHCP relay suppression is disabled on all interfaces by default.

Syntax

no ip dhcp relay suppression

Parameter Description

N/A

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

After you configure this command on an interface, DHCP request packets received over the interface are filtered out, but the other DHCP requests are forwarded.

Examples

The following example enables DHCP relay suppression on interface GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip dhcp relay suppression
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.39 ip dhcp relay source

Function

Run the **ip dhcp relay source** command to configure the source address of DHCP relay packets.

Run the **no** form of this command to remove this configuration.

No source address is configured for DHCP relay packets by default.

Syntax

ip dhcp relay source *ip-address*

no ip dhcp relay source

Parameter Description

ip-address: Source address of DHCP relay packets.

Command Modes

Interface configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

In some networks, multiple DHCP relay agents use the same interface IP address. In this case, you need to run this command on the DHCP relay agent to add another interface IP address to the source address field and **Giaddr** field of DHCP relay packets. Only one source IP address can be specified for DHCP relay packets on an interface.

Examples

The following example configures the source address of DHCP relay packets on GigabitEthernet 0/1.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface gigabitethernet 0/1
Hostname(config-if-GigabitEthernet 0/1)# ip dhcp relay source 1.1.1.1
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.40 ip dhcp save-history-enable

Function

Run the **ip dhcp save-history-enable** command to enable the function of saving historical leases to the database.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

The function of saving historical leases to the database is disabled by default.

Syntax

ip dhcp save-history-enable

no ip dhcp save-history-enable

default ip dhcp save-history-enable

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

N/A

Usage Guidelines

This command is configured on a DHCP server.

With this function enabled, after a DHCP server assigns an IP address to a client and the client goes offline, the DHCP server saves the IP address lease of the client to the database. When the client goes online again, the DHCP server assigns this address to the client again. Historical leases are saved when a DHCP process restarts or the device performs a hot backup switchover.

Examples

The following example enables the function of saving historical leases to the database.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp save-history-enable
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.41 ip dhcp server arp-detect

Function

Run the **ip dhcp server arp-detect** command to enable go-offline detection.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

Go-offline detection is disabled by default.

Syntax

ip dhcp server arp-detect

no ip dhcp server arp-detect

default ip dhcp server arp-detect

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Go-offline detection enables a DHCP server to check whether a client is offline. If a user goes offline and does not go online again within a period of time, the DHCP server reclaims the IP address assigned to the user.

Examples

The following example enables go-offline detection.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp server arp-detect
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.42 ip dhcp server detect

Function

Run the **ip dhcp server detect** command to enable rogue server detection.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

Rogue server detection is disabled by default.

Syntax

ip dhcp server detect

no ip dhcp server detect

default ip dhcp server detect

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

After rogue server detection is configured, rogue servers in a network are recorded into logs.

Examples

The following example enables rogue server detection.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp server detect
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.43 ip dhcp smart-relay

Function

Run the **ip dhcp smart-relay** command to enable the automatic gateway switchover function.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

The automatic gateway switchover function is disabled by default.

Syntax

ip dhcp smart-relay

no ip dhcp smart-relay

default ip dhcp smart-relay

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

After the function of configuring multiple gateway IP addresses on a DHCP relay agent is enabled, the primary IP address is used as the gateway IP address and the DHCP server assigns a network segment based on the gateway IP address. When a client fails to apply for an IP address over the gateway by using the primary IP address, it applies for an IP address over the gateway by using a secondary IP address after 24s.

After the automatic gateway switchover function is enabled, the DHCP relay agent adds another address to the **giaddr** field if it does not receive a reply packet for three consecutive DISCOVER packets. The relay gateway address switching sequence starts from the primary IP address to secondary IP addresses (secondary IP addresses are traversed based on their configuration sequence) until an IP address is obtained successfully.

Examples

The following example enables the automatic gateway switchover function.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp smart-relay
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.44 ip dhcp use class

Function

Run the **ip dhcp use class** command to enable address assignment based on class rules.

Run the **no** form of this command to disable this feature.

Address assignment based on class rules is disabled by default.

Syntax

ip dhcp use class

no ip dhcp use class

Parameter Description

N/A

Command Modes

Global configuration mode

Usage Guidelines

This command is configured on a DHCP server.

When clients apply for IP addresses through different access points (APs), Option 82 carried by packets of the clients is different. Class rules are used to match Option 82 to assign clients with IP addresses in different network segments.

Examples

The following example enables address assignment based on class rules.

```
Hostname> enable
```

```
Hostname# configure terminal
Hostname(config)# ip dhcp use class
```

Notifications

N/A

Common Errors

N/A

Platform Description

N/A

Related Commands

N/A

1.45 ip helper-address

Function

Run the **ip helper-address** command to configure a DHCP server IP address globally or on an interface of a DHCP relay agent.

Run the **no** form of this command to remove this configuration.

No DHCP server IP address is configured for a DHCP relay agent by default.

Syntax

ip helper-address { **cycle-mode** | [**vrf** *vrf-name*] *ip-address* }

no ip helper-address { **cycle-mode** | [**vrf** *vrf-name*] *ip-address* }

Parameter Description

cycle-mode: Forwards DHCP request packets to all DHCP servers.

vrf *vrf-name*: Specifies the virtual routing and forwarding (VRF) instance to which the specified DHCP server belongs. The default value is the VRF instance of the interface over which packets are sent.

ip-address: DHCP server IP address.

Command Modes

Global configuration mode

Interface configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP relay agent.

After a DHCP server IP address is configured, the DHCP relay agent forwards DHCP request packets to a DHCP server and DHCP reply packets to DHCP clients.

The DHCP server address can be globally configured or configured on an L3 interface. A maximum of 20 DHCP server addresses can be globally configured or configured on each L3 interface. When an interface receives a DHCP request packet, the DHCP server list on the interface prevails over that configured globally. If the interface is not configured with the DHCP server list, the global DHCP server list takes effect.

A DHCP relay agent supports the VRF-based relay function. To configure the function, add VRF parameters before the server address.

In global configuration mode, the **cycle-mode** parameter of the DHCP relay agent can be configured. If **cycle-mode** is configured, the DHCP relay agent forwards packets from DHCP clients to all DHCP servers configured on L3 interfaces or VRFs. If **cycle-mode** is not configured, the DHCP relay agent forwards packets from DHCP clients only to the first DHCP server meeting the preceding rules. **cycle-mode** is configured only in global configuration mode but takes effect in both global and interface configuration modes. **cycle-mode** is configured by default.

Examples

The following example sets the DHCP server IP address on VLAN 1 to **192.168.11.1**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# interface vlan 1
Hostname(config-if-VLAN 1)# ip helper-address 192.168.11.1
```

The following example sets the global DHCP server IP address to **192.168.100.1**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip helper-address 192.168.100.1
```

The following example enables a DHCP relay agent to forward DHCP request packets to all DHCP servers.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip helper-address cycle-mode
```

Notifications

N/A

Common Errors

- The **ip helper-address** command is configured on an L2 interface.
- The DHCP Relay function is disabled when the **ip helper-address** command is configured.
- A DHCP client is configured to obtain an IP address through a DHCP relay agent and directly from a DHCP server. As a result, the DHCP client fails to obtain a correct IP address.

Platform Description

N/A

Related Commands

N/A

1.46 lease

Function

Run the **lease** command to configure the lease time of an IP address assigned by a DHCP server to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default lease time is permanent for addresses in a static address pool and one day for addresses in other address pools.

Syntax

lease { *days* [*hours*] [*minutes*] | **infinite** }

no lease

default lease

Parameter Description

days: Lease time, in days. The value range is from 0 to 365. The default value is **1**.

hours: Lease time, in hours. You must define days before hours. The value range is from 0 to 23. The default value is **0**.

minutes: Lease time, in minutes. You must define days and hours before minutes. The value range is from 0 to 59. The default value is **0**.

infinite: Specifies a permanent lease.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When a lease time is to expire, a DHCP client sends a request for lease renewal. Generally, a DHCP server allows lease renewal and the IP address remains unchanged. The lease time ranges from 1 minute to 365 days, 23 hours, and 59 minutes.

Examples

The following example sets the lease time of IP addresses assigned to DHCP clients from address pool mypool0 to 1 hour.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# lease 0 1
```

The following example sets the lease time of IP addresses assigned to DHCP clients from address pool mypool0 to 1 minute.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# lease 0 0 1
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.47 lease-threshold

Function

Run the **lease-threshold** command to configure an alarm threshold for a DHCP address pool.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

The default alarm threshold is 90% for the address pool.

Syntax

lease-threshold *threshold-percentage*

no lease-threshold

default lease-threshold

Parameter Description

threshold-percentage: Alarm threshold of an address pool, in percentage (%). The value range is from 60 to 100.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When the IP address usage of an address pool reaches the threshold, a DHCP server generates syslog alarms. The IP address usage is the ratio of assigned IP addresses to available IP addresses in an address pool. If the number of assigned IP addresses exceeds the alarm threshold, one alarm is generated every 5 minutes.

Examples

The following example sets the alarm threshold of DHCP address pool mypool0 to **80%**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# lease-threshold 80
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.48 match ip

Function

Run the **match ip** command to configure an AM rule.

Run the **no** form of this command to remove this configuration.

No AM rule is configured by default.

Syntax

match ip *ip-address mask* [*interface-type interface-number*] [**add** | **remove**] **vlan** *vlan-id*

no match ip *ip-address mask* [*interface-type interface-number*] [**add** | **remove**] **vlan** *vlan-id*

clear match ip [*interface-type interface-number*]

Parameter Description

ip-address: Network address.

mask: Address mask.

interface-type interface-number: Interface type and interface number.

add: Adds a specified VLAN.

remove: Removes a specified VLAN.

vlan *vlan-id*: Specifies the index of a VLAN.

Command Modes

AM rule configuration mode

Default Level

14

Usage Guidelines

In super VLAN scenarios, a client that meets requirements of client matching rule in a DHCP static address pool is assigned with an address from this static address pool regardless of a sub VLAN of the client. During address assignment based on AM rules, an address is assigned to the client regardless of the sub VLAN or DHCP server port from which DHCP requests are received, as long as the assigned address takes effect in the corresponding VLAN.

AM rules take effect only for static address assignment and are invalid to dynamic address assignment.

Examples

The following example configures an AM rule: For DHCP clients from GigabitEthernet 0/1 in VLAN 10, the network number is set to **192.168.11.0** and the mask is set to **255.255.255.0**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# address-manage
Hostname(config-address-manage)# match ip 192.168.11.0 255.255.255.0
gigabitethernet 0/1 vlan 10
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.49 match ip default

Function

Run the **match ip default** command to configure the default AM rule.

Run the **no** form of this command to remove this configuration.

No default AM rule is configured by default.

Syntax

match ip default *ip-address mask*

no match ip default *ip-address mask*

Parameter Description

ip-address: Network address.

mask: Address mask.

Command Modes

AM rule configuration mode

Default Level

14

Usage Guidelines

After this command is configured, the DHCP server assigns an IP address from the default range to a DHCP client if no AM matching rule is configured on the interface over which the DHCP request is sent. If this command is not configured, IP addresses are assigned through the regular process.

Examples

The following example configures the default AM rule: the network number is 192.168.12.0, and the mask is 255.255.255.0.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# address-manage
Hostname(config-address-manage)# match ip default 192.168.12.0 255.255.255.0
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.50 match ip loose

Function

Run the **match ip loose** command to enable the loose mode for AM rules.

Run the **no** form of this command to disable this feature.

The loose mode of AM rules is disabled by default.

Syntax

match ip loose

no match ip loose

Parameter Description

N/A

Command Modes

AM rule configuration mode

Default Level

14

Usage Guidelines

After AM rules based on VLAN or VLAN + port are configured, IP addresses within a specified range are assigned to clients that match these rules. Clients that fail to match the rules cannot obtain IP addresses. You can run the **match ip loose** command to enable the loose mode for AM rules. In this case, clients that match no AM rule can obtain IP addresses in the way same as the case with no AM rule configured.

Examples

The following example enables the loose mode for AM rules.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# address-manage
Hostname(config-address-manage)# match ip loose
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.51 netbios-name-server

Function

Run the **netbios-name-server** command to configure the NetBIOS Windows Internet Name Service (WINS) server that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No NetBIOS WINS server is configured by default.

Syntax

netbios-name-server *ip-address*&<1-8>

no netbios-name-server

default netbios-name-server

Parameter Description

ip-address&<1-8>: IP address of a NetBIOS WINS server. **<1-8>** indicates that up to eight NetBIOS WINS server IP addresses can be entered, and the IP addresses are separated by spaces.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When multiple NetBIOS WINS servers are defined, the first defined NetBIOS WINS server has the highest priority. A DHCP client selects the next NetBIOS WINS server only when it fails to communicate with the first defined NetBIOS WINS server.

Examples

The following example sets the NetBIOS WINS server IP address assigned to DHCP clients with addresses from DHCP address pool mypool0 to **192.168.12.3**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# netbios-name-server 192.168.12.3
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# netbios-name-server 225.2.2.2
%Error: ip address (225.2.2.2) is not valid!
```

Common Errors

- Non-unicast addresses are configured.
- More than eight valid addresses are configured.

Related Commands

N/A

1.52 netbios-node-type

Function

Run the **netbios-node-type** command to configure the NetBIOS node type that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No NetBIOS node type is configured by default.

Syntax

netbios-node-type *type*

no netbios-node-type

default netbios-node-type

Parameter Description

Type: NetBIOS node type, which can be defined as:

- A hexadecimal number, ranging from 0 to FF. Only the following values are available:

- **1**: Broadcast node
- **2**: Peer-to-peer node
- **4**: Mixed node
- **8**: Hybrid node

- A character string:
- **b-node**: Broadcast node
- **p-node**: Peer-to-peer node
- **m-node**: Mixed node
- **h-node**: Hybrid node

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

NetBIOS node types for Microsoft DHCP clients include the following:

- Broadcast: Parses NetBIOS names in broadcast mode.
- Peer-to-peer: Requests the WINS server to parse NetBIOS names.
- Mixed: Requests name parsing in broadcast mode and connects to the WINS server to parse names.
- Hybrid: Requests the WINS server to parse NetBIOS names, and parses NetBIOS names in broadcast mode if no response is received.

The default node type of a DHCP client running a Microsoft operating system is broadcast or hybrid. If no WINS server is configured, the client is a broadcast node. Otherwise, it is a hybrid node. You are advised to set the NetBIOS node type to hybrid.

Examples

The following example sets the NetBIOS node type to hybrid in DHCP address pool mypool0.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# netbios-node-type h-node
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.53 network

Function

Run the **Network** command to configure the primary network segment for dynamic assignment in a DHCP address pool.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No primary network segment for dynamic assignment in a DHCP address pool is configured by default.

Syntax

network *network-number mask* [*low-ip-address high-ip-address*]

no network

default network

Parameter Description

network-number: Network number of IP addresses in a DHCP address pool.

mask: Network mask of IP addresses in a DHCP address pool. If no mask is defined, the natural mask is applied.

low-ip-address: Start IP address.

high-ip-address: End IP address.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

This command is used to define a subnet and subnet mask of an address pool to provide a DHCP server with a range of addresses. Unless excluded addresses are configured, the DHCP server assigns all addresses from an address pool to DHCP clients. The IP addresses in a pool are assigned in order. If an address is assigned or exists in the target network segment, the next address is checked until a valid address is assigned.

To display address assignment information, run the **show ip dhcp binding** command. To display address conflict detection information, run the **show ip dhcp conflict** command.

Examples

The following example sets the network number and mask of DHCP address pool mypool0 to **192.168.12.0** and **255.255.255.240**, respectively.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# network 192.168.12.0 255.255.255.240
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# network 238.5.5.5 255.0.0.0
238.5.5.5 / 255.0.0.0 is an invalid network
```

Common Errors

Non-unicast addresses are configured.

Related Commands

- **show ip dhcp binding**
- **show ip dhcp conflict**

1.54 next-server

Function

Run the **next-server** command to configure the boot server list that a DHCP server assigns to a DHCP client.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No boot server list is configured by default.

Syntax

next-server *ip-address*&<1-8>

no next-server

default next-server

Parameter Description

ip-address&<1-8>: IP address of a boot server. **<1-8>** indicates that up to eight boot server IP addresses can be entered, and the IP addresses are separated by spaces. At least one boot server needs to be configured.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

When multiple boot servers are defined, the first defined boot server has the highest priority. A DHCP client selects the next boot server only when it fails to communicate with the first defined boot server.

Examples

The following example sets the boot server for a DHCP client with an address from DHCP address pool mypool0 to **192.168.12.4**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# next-server 192.168.12.4
```

Notifications

When an invalid address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# next-server 238.5.5.5
% Error: ip address(238.5.5.5) is invalid!
```

Common Errors

- Non-unicast addresses are configured.
- More than eight boot server addresses are configured.

Related Commands

N/A

1.55 option

Function

Run the **option** command to define DHCP server options.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No DHCP server option is defined by default.

Syntax

option *code* { **ascii** *string* | **hex** *string* | **ip** *ip-address*&<1-16> }

no option

default option

Parameter Description

code: Code of a DHCP option.

ascii *string*: Defines an ASCII character string. The value is a case-sensitive string of 1 to 255 characters.

hex *string*: Defines a hexadecimal character string. The character length must be an even number. The value is a string of 2 to 240 characters.

ip *ip-address*&<1-16>: Defines an IP address. **<1-16>** indicates that up to 16 IP addresses can be entered, and the IP addresses are separated by spaces.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

DHCP provides a mechanism to send configuration information to hosts in a TCP/IP network. DHCP packets contain options, which are variable and can be defined as required. DHCP clients must be able to receive DHCP packets that carry option information of at least 312 bytes. The fixed data field in DHCP packets is also an option.

When this command is executed for an option multiple times in an address pool, the last configuration prevails.

The values of well-known options are fixed. Do not configure options 3, 6, 15, 44, 46, 50–55, 57–59, 61, 82, and 119.

Read the standard protocol file carefully to ensure correct configuration. For example, Option 33 is used to set static routes. This option contains one or more groups of static routes (including the destination address and gateway address). During configuration, enter an even number of IP addresses and do not set the destination IP address to **0.0.0.0**.

Examples

The following example defines Option 19 in address pool mypool0. This option determines whether a DHCP client enables IP packet forwarding. The value **0** indicates that IP packet forwarding is disabled, and the value **1** indicates that IP packet forwarding is enabled. In this example, the DHCP client enables IP packet forwarding.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# option 19 hex 01
```

The following example defines Option 33 in address pool mypool0. This option provides static route information to DHCP clients. DHCP clients obtain two static routes. For one route, the destination address is 172.16.12.0, and the gateway address is 192.168.12.12. For the other route, the destination address is 172.16.16.0, and the gateway address is 192.168.12.16.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# option 33 ip 172.16.12.0 192.168.12.12 172.16.16.0
192.168.12.16
```

Notifications

When an invalid static route address is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# option 56 ip 2.2.2.2 225.5.5.5
% Error: ip address 225.5.5.5 is not valid!
```

When an invalid hexadecimal character string is configured, the following notification will be displayed:

```
Hostname(dhcp-config)# option 253 hex abcdef_
```

```
% DHCP could not parse the hexadecimal string. Check character 6 (_).
```

Common Errors

- Non-unicast addresses are configured.
- More than eight static route addresses are configured.
- An invalid hexadecimal character string is configured.

Related Commands

N/A

1.56 pool-status

Function

Run the **pool-status** command to configure whether to enable a DHCP address pool.

A created address pool is automatically enabled by default.

Syntax

pool-status { **enable** | **disable** }

Parameter Description

enable: Enables an address pool.

disable: Disables an address pool.

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

You can run this command to enable or disable an address pool temporarily when using a DHCP server.

Examples

The following example disables address pool mypool0.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# pool-status disable
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.57 relay agent information

Function

Run the **relay agent information** command to enter the Option 82 matching information configuration mode from the global class configuration mode.

Run the **no** form of this command to remove this configuration.

Syntax

relay agent information

no relay agent information

Parameter Description

N/A

Command Modes

Global class configuration mode

Usage Guidelines

This command is configured on a DHCP server.

After this command is executed, the system enters the Option 82 matching information configuration mode. In this configuration mode, you can configure multiple Option 82 matching options for a class.

Examples

The following example configures a class named **myclass** and enters the Option 82 matching information configuration mode.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp class myclass
Hostname(config-dhcp-class)# relay agent information
Hostname(config-dhcp-class-relayinfo)#
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.58 relay-information hex

Function

Run the **relay-information hex** command to configure Option 82 matching information.

Run the **no** form of this command to remove this configuration.

No Option 82 matching information is configured by default.

Syntax

relay-information hex *hex-string*

no relay-information hex *hex-string*

Parameter Description

hex-string: Hexadecimal character string. The number of contained characters must be even. The value is a string of no more than 240 characters. If an asterisk (*) is added at the end of a character string, fuzzy match is used. Otherwise, exact match is used.

Command Modes

Option 82 information configuration mode under the global class configuration mode

Usage Guidelines

This command is configured on a DHCP server.

Examples

The following example configures a global class named **myclass**, which can match multiple pieces of Option 82 information.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp class myclass
Hostname(config-dhcp-class)# relay agent information
Hostname(config-dhcp-class-relayinfo)# relay-information hex 0102256535
Hostname(config-dhcp-class-relayinfo)# relay-information hex 010225654565
Hostname(config-dhcp-class-relayinfo)# relay-information hex 060225654565
Hostname(config-dhcp-class-relayinfo)# relay-information hex 060223*
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.59 remark

Function

Run the **remark** command to configure identification information of a class.

Run the **no** form of this command to remove this configuration.

No identification information is configured for a class by default.

Syntax

remark *class-remark*

no remark

Parameter Description

class-remark: Identification information of a class. The value is a string of 1 to 240 characters, and spaces are allowed.

Command Modes

Global class configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

Examples

The following example sets the identification information of a global class named **myclass** to **used in #1 build**.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp class myclass
Hostname(config-dhcp-class)# remark used in #1 build
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.60 service dhcp

Function

Run the **service dhcp** command to enable the DHCP Server or DHCP Relay function.

Run the **no** form of this command to disable this feature.

Run the **default** form of this command to restore the default configuration.

The DHCP Server and DHCP Relay functions are disabled by default.

Syntax

service dhcp

no service dhcp

default service dhcp

Parameter Description

N/A

Command Modes

Global configuration mode

Default Level

14

Usage Guidelines

A DHCP server can automatically assign IP addresses and provide network configurations such as the DNS server address and default gateway address to DHCP clients.

A DHCP relay agent can forward DHCP packets between a DHCP client and a DHCP server.

The **service dhcp** command is used to enable both the DHCP Server and DHCP Relay functions. However, a device cannot function as a DHCP server and relay at the same time. When a device is configured with a valid address pool, it acts as a server. Otherwise, it serves as a relay.

Examples

The following example enables the DHCP Server function.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# service dhcp
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.61 show ip dhcp binding

Function

Run the **show ip dhcp binding** command to display DHCP address binding information.

Syntax

show ip dhcp binding [*ip-address*]

Parameter Description

ip-address: IP address for which binding information is displayed. If this parameter is not configured, all binding information is displayed.

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server.

If no IP address is defined, binding information of all IP addresses is displayed. If an IP address is defined, binding information of this IP address is displayed.

Examples

The following example displays DHCP address binding information.

```
Hostname> enable
Hostname# show ip dhcp binding
Total number of clients   : 4
Expired clients           : 3
Running clients           : 1
IP address        Hardware address       Lease expiration            Type
20.1.1.1          2000.0000.2011         000 days 23 hours 59 mins   Automatic
```

Table 1-1Output Fields of the show ip dhcp binding Command

Field	Description
IP address	IP address assigned to a DHCP client
Hardware address	Hardware address of a DHCP client
Lease expiration	Lease expiration time ● **Infinite**: There is no time limitation. ● **IDLE**: The current address is idle because the lease of the address is not renewed or a DHCP client releases the IP address actively.
Type	Address binding type ● **Automatic**: IP addresses are automatically assigned. ● **Manual**: IP addresses are manually assigned.

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.62 show ip dhcp conflict

Function

Run the **show ip dhcp conflict** command to display IP address conflict records of a DHCP server.

Syntax

show ip dhcp conflict

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays address conflict records of a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp conflict
IP address     Detection Method
192.168.12.1             Ping
```

Table 1-1Output Fields of the show ip dhcp conflict Command

Field	Description
IP address	IP address that cannot be assigned to a DHCP client
Detection Method	Conflict detection method

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.63 show ip dhcp database

Function

Run the **show ip dhcp database** command to display the running status of the database backup function of a DHCP server.

Syntax

show ip dhcp database

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the running status of the database backup function of a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp database
Enable          :No
Status          :ready
Save File       :Default
Successs        :0
Failures        :0
Interval Time   :86400
```

Table 1-1 Output Fields of the show ip dhcp database Command

Field	Description
Enable	Indicates whether the database backup function is enabled.
Status	Data restoration status.
Save File	Path of Data saving file.

Field	Description
Success	Number of successful data savings.
Failures	Number of failed data savings.
Interval Time	Data saving interval.

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.64 show ip dhcp dns dynamic

Function

Run the **show ip dhcp dns dynamic** command to display the DNS server address obtained from an external DHCP server when the device works in PPPoE or DHCP client mode.

Syntax

show ip dhcp dns dynamic

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays lease information about an assigned IP address, that is, the DNS server address obtained from an external DHCP server when the device works in PPPoE or DHCP client mode.

```
Hostname> enable
Hostname# show ip dhcp dns dynamic
Get dynamic dns is open
No.  DYNAMIC-DNS
-  -----
```

```
1    20.1.1.12
```

Table 1-1Output Fields of the show ip dhcp dns dynamic Command

Field	Description
Get dynamic dns is	● **open**: The function of obtaining a DNS server address from an external DHCP server is enabled. ● **close**: The function of obtaining a DNS server address from an external DHCP server is disabled.
DYNAMIC-DNS	DNS server address obtained from an external DHCP server when the device works in PPPoE or DHCP client mode.

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.65 show ip dhcp history

Function

Run the **show ip dhcp history** command to display historical lease records.

Syntax

show ip dhcp history

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays historical lease records.

```
Hostname> enable
Hostname# show ip dhcp history
```

```
Expired clients           : 3
IP address        Hardware address       Lease expiration           Vlan/Relay
10.1.1.5          2222.abcd.47ac         IDLE                       4097
10.1.1.4          2222.abcd.47ae         IDLE                       4097
10.1.1.3          2222.abcd.47ad         IDLE                       4097
Running clients           : 0
```

Table 1-1Output Fields of the show ip dhcp history Command

Field	Description
IP address	IP address assigned to a DHCP client
Hardware address	MAC address of a DHCP client
Lease expiration	Lease expiration time ● **Infinite**: There is no time limitation. ● **IDLE**: The current address is idle because the lease of the address is not renewed or a DHCP client releases the IP address actively.
Vlan/Relay	If a DHCP client applies for an IP address through a DHCP relay agent, the DHCP relay agent address is displayed. Otherwise, the index of the port that receives DHCP packets is displayed.
Running clients	Total number of online clients

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.66 show ip dhcp identifier

Function

Run the **show ip dhcp identifier** command to display the address pool ID and address usage of a DHCP server.

Syntax

show ip dhcp identifier

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

The address pool ID can be used to construct an object identifier (OID) of a Management Information Base (MIB) to access specific content of an address pool.

Examples

The following example displays the address pool ID and address usage of a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp identifier
Pool  name    Identifier      Total     Distributed  Remained
----  -----  -----  -----  ----
wwp           597455782    65533        0            65533
```

Table 1-1Output Fields of the show ip dhcp identifier Command

Field	Description
Pool name	Address pool name
Identifier	Address pool ID
Total	Total number of assignable addresses in an address pool
Distributed	Number of assigned addresses
Remained	Number of unassigned and reusable addresses

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.67 show ip dhcp pool

Function

Run the **show ip dhcp pool** command to display the address pool status and utilization of a DHCP server.

Syntax

show ip dhcp pool [*pool-name*]

Parameter Description

pool-name: Name of an address pool whose information is to be displayed. If this parameter is not configured, configurations of all address pools are displayed.

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the address pool status and utilization of a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp pool
Pool  name       Total     Distributed  Remained   Percentage
----  -----  -----  ----   -----
net20         253          11           242        4.34782
test          0            0            0          0.00000
```

Table 1-1Output Fields of the show ip dhcp pool Command

Field	Description
Pool address	Address pool name
Total	Total number of assignable addresses in an address pool
Distributed	Number of assigned addresses
Remained	Number of unassigned and reusable addresses
Percentage	Address utilization of an address pool

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.68 show ip dhcp relay-statistics

Function

Run the **show ip dhcp relay-statistics** command to display statistics of a DHCP relay agent.

Syntax

show ip dhcp relay-statistics

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays statistics of a DHCP relay agent.

```
Hostname> enable
Hostname# show ip dhcp relay-statistics
Cycle mode                0
Message                   Count
Discover                  0
Offer                     0
Request                   0
Ack                       0
Nak                       0
Decline                   0
Release                   0
Info                      0
Bad                       0
Direction                 Count
Rx client                 0
Rx client uni             0
Rx client bro             0
Tx client                 0
Tx client uni             0
Tx client bro             0
Rx server                 0
```

Table 1-1Output Fields of the show ip dhcp relay-statistics Command

Field	Description
Cycle mode	● **0**: Packets can be sent to multiple DHCP servers. ● **1**: Packets can be sent only to the specified DHCP server.
Discover	Total number of DISCOVER packets received
Offer	Total number of OFFER packets received
Request	Total number of REQUEST packets received
Ack	Total number of ACK packets received
Nak	Total number of NAK packets received
Decline	Total number of DECLINE packets received
Release	Total number of RELEASE packets received
Info	Total number of INFORM packets received
Bad	Total number of abnormal DHCP packets received
Direction	Packet statistics by direction
Rx client	Total number of packets received from clients
Rx client uni	Total number of unicast packets received from clients
Rx client bro	Total number of broadcast packets received from clients
Tx client	Total number of packets forwarded to clients
Tx client uni	Total number of unicast packets forwarded to clients
Tx client bro	Total number of broadcast packets forwarded to clients
Rx server	Total number of packets received from a server

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.69 show ip dhcp server detect

Function

Run the **show ip dhcp server detect** command to display the list of detected rogue servers.

Syntax

show ip dhcp server detect

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the list of rogue servers detected by a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp server detect
The DHCP Server information(total: 1):
NO.   SERVER IP       INTERFACE
1      10.1.10.40     GigabitEthernet 0/1
```

Table 1-1Output Fields of the show ip dhcp server detect Command

Field	Description
The DHCP Server information(total: x)	Rogue servers detected by a DHCP server, *x* in total
NO.	No.
SERVER IP	IP address of a rogue server
INTERFACE	Interface over which a rogue server is detected

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.70 show ip dhcp server statistics

Function

Run the **show ip dhcp server statistics** command to display statistics of a DHCP server.

Syntax

show ip dhcp server statistics

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays statistics of a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp server statistics
Address pools              2
Lease counter              4
Active Lease Counter     0
Expired Lease Counter      4
Malformed messages         0
Dropped messages           0

Message                    Received
BOOTREQUEST              216
DHCPDISCOVER             33
DHCPREQUEST              25
DHCPDECLINE               0
DHCPRELEASE               1
DHCPINFORM                150

Message                      Sent
BOOTREPLY                  16
DHCPOFFER                  9
DHCPACK                     7
DHCPNAK                     0
----------------
recv                           0
```

```
send                            0
```

Table 1-1Output Fields of the show ip dhcp server statistics Command

Field	Description
Address pools	Number of address pools
Lease counter	Number of assigned leases
Active Lease Counter	Number of online leases
Expired Lease Counter	Number of aged leases
Automatic bindings	Number of automatically bound IP addresses
Manual bindings	Number of manually bound IP addresses
Expired bindings	Number of expired bindings
Malformed messages	Number of abnormal DHCP packets received
Dropped messages	Number of discarded packets
Message Received	Number of each type of DHCP packets received
Message Sent	Number of each type of DHCP packets sent
BOOTREQUEST	Total number of BOOTP request packets
DHCPDISCOVER	Total number of DISCOVER packets received
DHCPREQUEST	Total number of REQUEST packets
DHCPDECLINE	Total number of DECLINE packets
DHCPRELEASE	Total number of RELEASE packets
DHCPINFORM	Total number of INFORM packets
BOOTREPLY	Total number of BOOTP reply packets
DHCPOFFER	Total number of OFFER packets
DHCPACK	Total number of ACK packets
DHCPNAK	Total number of NAK packets
recv	Total number of received packets
send	Total number of sent packets

Notifications

N/A

Common Errors

N/A

Related Commands

N/A

1.71 show ip dhcp socket

Function

Run the **show ip dhcp socket** command to display the socket index used by a DHCP server.

Syntax

show ip dhcp socket

Parameter Description

N/A

Command Modes

All modes except the user EXEC mode

Default Level

14

Usage Guidelines

N/A

Examples

The following example displays the socket index used by a DHCP server.

```
Hostname> enable
Hostname# show ip dhcp socket
dhcp socket = 47.
```

Table 1-1 Output Fields of the show ip dhcp socket Command

Field	Description
dhcp socket	Socket index

Notifications

N/A

Platform Description

N/A

Related Commands

N/A

1.72 update arp

Function

Run the **update arp** command to enable a DHCP server to add trusted ARP entries during address assignment.

Run the **no** form of this command to remove this configuration.

Run the **default** form of this command to restore the default configuration.

No trusted ARP entry is added during DHCP address assignment by default.

Syntax

update arp

no update arp

default update arp

Parameter Description

N/A

Command Modes

DHCP address pool configuration mode

Default Level

14

Usage Guidelines

This command is configured on a DHCP server. After this command is configured for an address pool, the DHCP server adds trusted ARP entries when assigning IP addresses from the address pool. A trusted ARP entry has a higher priority than a dynamic ARP entry and is not overridden by a dynamic ARP entry.

Examples

The following example enables a DHCP server to add trusted ARP entries when assigning addresses from address pool mypool0.

```
Hostname> enable
Hostname# configure terminal
Hostname(config)# ip dhcp pool mypool0
Hostname(dhcp-config)# update arp
```

Notifications

N/A

Common Errors

N/A

Related Commands

N/A