



DHCP Commands

Use the commands in this chapter to configure and monitor Dynamic Host Configuration Protocol (DHCP). For DHCP configuration information and examples, refer to the “Configuring DHCP” chapter of the *Cisco IOS IP and IP Routing Configuration Guide*.

bootfile

To specify the name of the default boot image for a Dynamic Host Configuration Protocol (DHCP) client, use the **bootfile** DHCP pool configuration command. To delete the boot image name, use the **no** form of this command.

bootfile *filename*

no bootfile

Syntax Description	<i>filename</i>	Specifies the name of the file that is used as a boot image.
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Defaults	No default behavior or values.
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Command Modes	DHCP pool configuration
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Command History	Release	Modification
	12.0(1)T	This command was introduced.

Examples The following example specifies xllboot as the name of the boot file:

```
bootfile xllboot
```

Related Commands	Command	Description
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.
	next-server	Configures the next server in a DHCP client's boot process.

clear ip dhcp binding

To delete an automatic address binding from the Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server database, use the **clear ip dhcp binding** privileged EXEC command.

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

Syntax Description		
	<i>address</i>	The address of the binding you want to clear.
	*	Clears all automatic bindings.

Command Modes	
	Privileged EXEC

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines Typically, the address denotes the client's IP address. If the asterisk (*) character is used as the address parameter, DHCP clears all automatic bindings.

Use the **no ip dhcp pool** global configuration command to delete a manual binding.

Examples The following example deletes the address binding 10.12.1.99 from a DHCP server database:

```
clear ip dhcp binding 10.12.1.99
```

Related Commands	Command	Description
	show ip dhcp binding	Displays address bindings on the Cisco IOS DHCP Server.

clear ip dhcp conflict

To clear an address conflict from the Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server database, use the **clear ip dhcp conflict** privileged EXEC command.

clear ip dhcp conflict {*address* | *}

Syntax Description		
	<i>address</i>	The IP address of the host that contains the conflicting address you want to clear.
	*	Clears all address conflicts.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines The server detects conflicts using a ping session. The client detects conflicts using gratuitous Address Resolution Protocol (ARP). If the asterisk (*) character is used as the address parameter, DHCP clears all conflicts.

Examples The following example shows an address conflict of 10.12.1.99 being deleted from the DHCP server database:

```
clear ip dhcp conflict 10.12.1.99
```

Related Commands	Command	Description
	show ip dhcp conflict	Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.

clear ip dhcp server statistics

To reset all Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server counters, use the **clear ip dhcp server statistics** privileged EXEC command.

clear ip dhcp server statistics

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Release	Modification
12.0(1)T	This command was introduced.

Usage Guidelines The **show ip dhcp server statistics** command displays DHCP counters. All counters are cumulative. The counters will be initialized, or set to zero, with this command.

Examples The following example resets all DHCP counters to zero:

```
clear ip dhcp server statistics
```

Command	Description
show ip dhcp server statistics	Displays Cisco IOS DHCP Server statistics.

client-identifier

To specify the unique identifier (in dotted-hexadecimal notation) for a Microsoft Dynamic Host Configuration Protocol (DHCP) client, use the **client-identifier** DHCP pool configuration command. It is valid for manual bindings only. To delete the client identifier, use the **no** form of this command.

client-identifier *unique-identifier*

no client-identifier

Syntax Description	<i>unique-identifier</i>	The distinct identification of the client in dotted-hexadecimal notation, for example, 01b7.0813.8811.66.
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Command Modes	DHCP pool configuration
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Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines	Microsoft DHCP clients require client identifiers instead of hardware addresses. The client identifier is formed by concatenating the media type and the MAC address. For example, the Microsoft client identifier for Ethernet address b708.1388.f166 is 01b7.0813.88f1.66, where 01 represents the Ethernet media type. For a list of media type codes, refer to the “Address Resolution Protocol Parameters” section of RFC 1700, <i>Assigned Numbers</i> .
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Examples	The following example specifies the client identifier for Mac address b7.0813.8811.66 in dotted-hexadecimal notation:
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```
client-identifier 01b7.0813.8811.66
```

Related Commands	Command	Description
	hardware-address	Specifies the hardware address of a DHCP client.
	host	Specifies the IP address and network mask for a manual binding to a DHCP client.
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

client-name

To specify the name of a Dynamic Host Configuration Protocol (DHCP) client, use the **client-name** DHCP pool configuration command. The client name should not include the domain name. To remove the client name, use the **no** form of this command.

client-name *name*

no client-name

Syntax Description	<i>name</i>	Specifies the name of the client, using any standard ASCII character. The client name should not include the domain name. For example, the name mars should not be specified as mars.cisco.com .
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Command Modes	DHCP pool configuration
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Command History	Release	Modification
	12.0(1)T	This command was introduced.

Examples The following example specifies a string client1 that will be the name of the client:

```
client-name client1
```

Related Commands	Command	Description
	host	Specifies the IP address and network mask for a manual binding to a DHCP client.
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

default-router

To specify the default router list for a Dynamic Host Configuration Protocol (DHCP) client, use the **default-router** DHCP pool configuration command. To remove the default router list, use the **no** form of this command.

default-router *address* [*address2...address8*]

no default-router

Syntax Description

<i>address</i>	Specifies the IP address of a router. One IP address is required, although you can specify up to eight addresses in one command line.
<i>address2...address8</i>	(Optional) Specifies up to eight addresses in the command line.

Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Usage Guidelines

The IP address of the router should be on the same subnet as the client subnet. You can specify up to eight routers in the list. Routers are listed in order of preference (address1 is the most preferred router, address2 is the next most preferred router, and so on).

Examples

The following example specifies 10.12.1.99 as the IP address of the default router:

```
default-router 10.12.1.99
```

Related Commands

Command	Description
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

dns-server

To specify the Domain Name System (DNS) IP servers available to a Dynamic Host Configuration Protocol (DHCP) client, use the **dns-server** DHCP pool configuration command. To remove the DNS server list, use the **no** form of this command.

dns-server *address* [*address2...address8*]

no dns-server

Syntax Description	<i>address</i>	Specifies the IP address of a DNS server. One IP address is required, although you can specify up to eight addresses in one command line.
	<i>address2...address8</i>	(Optional) Specifies up to eight addresses in the command line.

Defaults If DNS IP servers are not configured for a DHCP client, the client cannot correlate host names to IP addresses.

Command Modes DHCP pool configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines Servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

Examples The following example specifies 10.12.1.99 as the IP address of the domain name server of the client:

```
dns-server 10.12.1.99
```

Related Commands	Command	Description
	domain-name	Specifies the domain name for a DHCP client.
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

domain-name

To specify the domain name for a Dynamic Host Configuration Protocol (DHCP) client, use the **domain-name** DHCP pool configuration command. To remove the domain name, use the **no** form of this command.

domain-name *domain*

no domain-name

Syntax Description

<i>domain</i>	Specifies the domain name string of the client.
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Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Examples

The following example specifies cisco.com as the domain name of the client:

```
domain-name cisco.com
```

Related Commands

Command	Description
dns-server	Specifies the DNS IP servers available to a DHCP client.
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

hardware-address

To specify the hardware address of a Dynamic Host Configuration Protocol (DHCP) client, use the **hardware-address** DHCP pool configuration command. It is valid for manual bindings only. To remove the hardware address, use the **no** form of this command.

hardware-address *hardware-address type*

no hardware-address

Syntax Description	
<i>hardware-address</i>	Specifies the MAC address of the client's hardware platform.
<i>type</i>	Indicates the protocol of the hardware platform. Strings and values are acceptable. The string options are: <ul style="list-style-type: none"> • ethernet • ieee802 The value options are: <ul style="list-style-type: none"> • 1 10Mb Ethernet • 6 IEEE 802 If no type is specified, the default protocol is Ethernet.

Defaults Ethernet is the default type if none is specified.

Command Modes DHCP pool configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Examples The following example specifies b708.1388.f166 as the MAC address of the client:

```
hardware-address b708.1388.f166
```

Related Commands	Command	Description
	client-identifier	Specifies a Microsoft DHCP client's unique identifier (in dotted-hexadecimal notation).
	host	Specifies the IP address and network mask for a manual binding to a DHCP client.
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.

host

To specify the IP address and network mask for a manual binding to a Dynamic Host Configuration Protocol (DHCP) client, use the **host** DHCP pool configuration command. To remove the IP address of the client, use the **no** form of this command.

host *address* [*mask* | *prefix-length*]

no host

Syntax Description

<i>address</i>	Specifies the IP address of the client.
<i>mask</i>	(Optional) Specifies the network mask of the client.
<i>prefix-length</i>	(Optional) Specifies the number of bits that comprise the address prefix. The prefix is an alternative way of specifying the network mask of the client. The prefix length must be preceded by a forward slash (/).

Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Usage Guidelines

If the mask and prefix length are unspecified, DHCP examines its address pools. If no mask is found in the pool database, the Class A, B, or C natural mask is used. This command is valid for manual bindings only.

There is no limit on the number of manual bindings but you can only configure one manual binding per host pool.

Examples

The following example specifies 10.12.1.99 as the client's IP address and 255.255.248.0 as the subnet mask:

```
host 10.12.1.99 255.255.248.0
```

Related Commands

Command	Description
client-identifier	Specifies a Microsoft DHCP client's unique identifier (in dotted-hexadecimal notation).
hardware-addresss	Specifies the hardware address of a DHCP client.
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.
network (DHCP)	Configures the subnet number and mask for a DHCP address pool on a Cisco IOS DHCP Server.

ip dhcp conflict logging

To enable conflict logging on a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server, use the **ip dhcp conflict logging** global configuration command. To disable conflict logging, use the **no** form of this command.

ip dhcp conflict logging

no ip dhcp conflict logging

Syntax Description This command has no arguments or keywords.

Defaults Conflict logging is enabled.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines Cisco recommends using a DHCP server database agent to store automatic bindings. If you decide not to use a DHCP server database agent to store automatic bindings, use the **no ip dhcp conflict logging** command to disable the recording of address conflicts. By default, the Cisco IOS DHCP server records DHCP address conflicts in a log file.

Examples The following example disables the recording of DHCP address conflicts:

```
no ip dhcp conflict logging
```

Related Commands	Command	Description
	clear ip dhcp conflict	Clears an address conflict from the Cisco IOS DHCP Server database.
	ip dhcp database	Configures a Cisco IOS DHCP Server to save automatic bindings on a remote host called a database agent.
	show ip dhcp conflict	Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.

ip dhcp database

You can configure a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server to save automatic bindings on a remote host called a database agent. To configure a DHCP server database agent and database agent parameters, use the **ip dhcp database** global configuration command. To remove the database agent, use the **no** form of this command.

ip dhcp database *url* [**timeout** *seconds* | **write-delay** *seconds*]

no ip dhcp database *url*

Syntax Description	<i>url</i>	Specifies the remote file used to store the automatic bindings. Following are the acceptable URL file formats: <ul style="list-style-type: none"> • tftp://host/filename • ftp://user:password@host/filename • rcp://user@host/filename
	timeout <i>seconds</i>	(Optional) Specifies how long, in seconds, the DHCP server should wait before aborting a database transfer. Transfers that exceed the timeout period are aborted. By default, DHCP waits 300 seconds before aborting a database transfer. Infinity is defined as 0 seconds.
	write-delay <i>seconds</i>	(Optional) Specifies how soon the DHCP server should send database updates. By default, DHCP waits 300 seconds (5 minutes) before sending database changes. The minimum delay is 60 seconds.

Defaults DHCP waits 300 seconds for both a write delay and a timeout.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines The administrator may configure multiple database agents. Bindings are transferred by using the File Transfer Protocol (FTP), Trivial File Transport Protocol (TFTP), or remote copy protocol (RCP).

Examples The following example specifies the DHCP database transfer timeout value at 80 seconds:

```
ip dhcp database ftp://user:password@172.16.1.1/router-dhcp timeout 80
```

The following example specifies the DHCP database update delay value at 100 seconds:

```
ip dhcp database tftp://172.16.1.1/router-dhcp write-delay 100
```

Related Commands

Command

Description

show ip dhcp database Displays Cisco IOS DHCP Server database agent information.

ip dhcp excluded-address

To specify IP addresses that a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server should not assign to DHCP clients, use the **ip dhcp excluded-address** global configuration command. To remove the excluded IP addresses, use the **no** form of this command.

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

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

Syntax Description	<i>low-address</i>	The excluded IP address, or first IP address in an excluded address range.
	<i>high-address</i>	(Optional) The last IP address in the excluded address range.

Defaults All IP pool addresses are assignable.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines The DHCP server assumes that all pool addresses may be assigned to clients. Use this command to exclude a single IP address or a range of IP addresses.

Examples The following example configures an excluded IP address range from 172.16.1.100 through 172.16.1.199:

```
ip dhcp excluded-address 172.16.1.100 172.16.1.199
```

Related Commands	Command	Description
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places the routing device in DHCP pool configuration mode.
	network (DHCP)	Configures the subnet number and mask for a DHCP address pool on a Cisco IOS DHCP Server.

ip dhcp limited-broadcast-address

To override a configured network broadcast and have the DHCP server and relay agent send an all networks, all nodes broadcast to a DHCP client, use the **ip dhcp limited-broadcast-address** global configuration command. To disable this functionality, use the **no** form of this command.

ip dhcp limited-broadcast-address

no ip dhcp limited-broadcast-address

Syntax Description

This command has no arguments or keywords.

Defaults

Default broadcast address: 255.255.255.255 (all ones)

Command Modes

Global configuration

Command History

Release	Modification
12.1	This command was introduced.

Usage Guidelines

When a DHCP client sets the broadcast bit in the DHCP packet, the DHCP server and relay agent send DHCP messages to clients using the all ones broadcast address (255.255.255.255). If the **ip broadcast-address** interface configuration command has been configured to send a network broadcast, the all ones broadcast set by DHCP is overridden. To remedy this situation, use the **ip dhcp limited-broadcast-address** command to ensure that a configured network broadcast does not override the default DHCP behavior.

Some DHCP clients can only accept an all ones broadcast and may not be able to acquire a DHCP address unless this command is configured on the router interface connected to the client.

Examples

The following example configures DHCP to override any network broadcast:

```
ip dhcp limited-broadcast-address
```

Related Commands

Command	Description
ip broadcast-address	Defines a broadcast address for an interface.

ip dhcp ping packets

To specify the number of packets a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server sends to a pool address as part of a ping operation, use the **ip dhcp ping packets** global configuration command. To prevent the server from pinging pool addresses, use the **no** form of this command.

ip dhcp ping packets *count*

no ip dhcp ping packets

Syntax Description	<i>count</i>	Indicates the number of ping packets that are sent before assigning the address to a requesting client. The default value is two packets.
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Defaults	Two packets
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Command Modes	Global configuration
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Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines	The DHCP server pings a pool address before assigning the address to a requesting client. If the ping is unanswered, the DHCP server assumes (with a high probability) that the address is not in use and assigns the address to the requesting client.
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Examples	The following example specifies five ping attempts by the DHCP server before ceasing any further ping attempts: <pre>ip dhcp ping packets 5</pre>
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Related Commands	Command	Description
	clear ip dhcp conflict	Clears an address conflict from the Cisco IOS DHCP Server database.
	ip dhcp ping timeout	Specifies how long a Cisco IOS DHCP Server waits for a ping reply from an address pool.
	show ip dhcp conflict	Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.

ip dhcp ping timeout

To specify how long a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server waits for a ping reply from an address pool, use the **ip dhcp ping timeout** global configuration command. To restore the default number of milliseconds (500) of the timeout, use the **no** form of this command.

ip dhcp ping timeout *milliseconds*

no ip dhcp ping timeout

Syntax Description	<i>milliseconds</i>	The amount of time in milliseconds that the DHCP server waits for a ping reply before it stops attempting to reach a pool address for client assignment. The maximum timeout is 10000 milliseconds (10 seconds). The default timeout is 500 milliseconds.								
Defaults	500 milliseconds									
Command Modes	Global configuration									
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>12.0(1)T</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	12.0(1)T	This command was introduced.					
Release	Modification									
12.0(1)T	This command was introduced.									
Usage Guidelines	This command specifies how long to wait for a ping reply in milliseconds.									
Examples	<p>The following example specifies that the DHCP server will wait 800 milliseconds for a ping reply before considering the ping a failure:</p> <pre>ip dhcp ping timeout 800</pre>									
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>clear ip dhcp conflict</td> <td>Clears an address conflict from the Cisco IOS DHCP Server database.</td> </tr> <tr> <td>ip dhcp ping packets</td> <td>Specifies the number of packets a Cisco IOS DHCP Server sends to a pool address as part of a ping operation.</td> </tr> <tr> <td>show ip dhcp conflict</td> <td>Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.</td> </tr> </tbody> </table>	Command	Description	clear ip dhcp conflict	Clears an address conflict from the Cisco IOS DHCP Server database.	ip dhcp ping packets	Specifies the number of packets a Cisco IOS DHCP Server sends to a pool address as part of a ping operation.	show ip dhcp conflict	Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.	
Command	Description									
clear ip dhcp conflict	Clears an address conflict from the Cisco IOS DHCP Server database.									
ip dhcp ping packets	Specifies the number of packets a Cisco IOS DHCP Server sends to a pool address as part of a ping operation.									
show ip dhcp conflict	Displays address conflicts found by a Cisco IOS DHCP Server when addresses are offered to the client.									

ip dhcp pool

To configure a Dynamic Host Configuration Protocol (DHCP) address pool on a Cisco IOS DHCP Server and enter DHCP pool configuration mode, use the **ip dhcp pool** global configuration command. To remove the address pool, use the **no** form of this command.

ip dhcp pool *name*

no ip dhcp pool *name*

Syntax Description	<i>name</i>	Can either be a symbolic string (such as “engineering”) or an integer (such as 0).
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Defaults	DHCP address pools are not configured.
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Command Modes	Global configuration
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Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines	During execution, the configuration mode changes to DHCP pool configuration mode, identified by the (config-dhcp)# prompt. In this mode, the administrator can configure pool parameters, like the IP subnet number and default router list.
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Examples	The following example configures pool1 as the DHCP address pool:
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```
ip dhcp pool pool1
```

Related Commands	Command	Description
	host	Specifies the IP address and network mask for a manual binding to a DHCP client.
	ip dhcp excluded-address	Specifies IP addresses that a Cisco IOS DHCP Server should not assign to DHCP clients.
	network (DHCP)	Configures the subnet number and mask for a DHCP address pool on a Cisco IOS DHCP Server.

ip dhcp relay information check

To configure a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server to validate the relay agent information option in forwarded BOOTREPLY messages, use the **ip dhcp relay information check** global configuration command. To disable an information check, use the **no** form of this command.

ip dhcp relay information check

no ip dhcp relay information check

Syntax Description This command has no arguments or keywords.

Defaults The DHCP server checks relay information. Invalid messages are dropped.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines This command is used by cable modem termination systems. By default, DHCP checks relay information. Invalid messages are dropped.

Examples The following example configures the DHCP server to check that the relay agent information option in forwarded BOOTREPLY messages is valid:

```
ip dhcp relay information check
```

Related Commands	Command	Description
	ip dhcp relay information option	Configures a Cisco IOS DHCP Server to insert the DHCP relay agent information option in forwarded BOOTREQUEST messages.
	ip dhcp relay information policy	Configures a DHCP relay agent's information reforwarding policy (what a DHCP relay agent should do if a message already contains relay information).

ip dhcp relay information option

To configure a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server to insert the DHCP relay agent information option in forwarded BOOTREQUEST messages, use the **ip dhcp relay information option** global configuration command. To disable inserting relay information into forwarded BOOTREQUEST messages, use the **no** form of this command.

ip dhcp relay information option

no ip dhcp relay information option

Syntax Description This command has no arguments or keywords.

Defaults The DHCP server does not insert relay information.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines This command is used by cable modem termination systems. By default, DHCP does not insert relay information.

Examples The following example configures a DHCP server to insert the DHCP relay agent information option in forwarded BOOTREQUEST messages:

```
ip dhcp relay information option
```

Related Commands	Command	Description
	ip dhcp relay information check	Configures a Cisco IOS DHCP Server to validate the relay agent information option in forwarded BOOTREPLY messages.
	ip dhcp relay information policy	Configures a DHCP relay agent's information reforwarding policy (what a DHCP relay agent should do if a message already contains relay information).

ip dhcp relay information policy

To configure the information reforwarding policy for a Dynamic Host Configuration Protocol (DHCP) relay agent (what a relay agent should do if a message already contains relay information), use the **ip dhcp relay information policy** global configuration command. To restore the default relay information policy, use the **no** form of this command .

ip dhcp relay information policy { drop | keep | replace }

no ip dhcp relay information policy

Syntax Description	drop	Directs the DHCP relay agent to discard messages with existing relay information if the relay information option is already present.
	keep	Indicates that existing information is left unchanged on the DHCP relay agent.
	replace	Indicates that existing information is overwritten on the DHCP relay agent.

Defaults The DHCP server replaces existing relay information.

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines This command is used by cable modem termination systems. When a DHCP relay agent receives a message from a another DHCP relay agent, relay information might already be present in the message. By default, the relay information from the previous relay agent is replaced.

Examples The following examples configure a DHCP relay agent to drop messages with existing relay information, keep existing information, and replace existing information:

```
ip dhcp relay information policy drop

ip dhcp relay information policy keep

ip dhcp relay information policy replace
```

Related Commands	Command	Description
	ip dhcp relay information check	Configures a Cisco IOS DHCP Server to validate the relay agent information option in forwarded BOOTREPLY messages.
	ip dhcp relay information option	Configures a Cisco IOS DHCP Server to insert the DHCP relay agent information option in forwarded BOOTREQUEST messages.

ip dhcp smart-relay

To allow the Cisco IOS Dynamic Host Configuration Protocol (DHCP) relay agent to switch the gateway address (giaddr field of a DHCP packet) to secondary addresses when there is no DHCPOFFER message from a DHCP server, use the **ip dhcp smart-relay** global configuration command. To disable this smart-relay functionality and restore the default behavior, use the **no** form of this command.

ip dhcp smart-relay

no ip dhcp smart-relay

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Global configuration

Release	Modification
12.1	This command was introduced.

Usage Guidelines The DHCP relay agent attempts to forward the primary address as the gateway address three times. After three attempts and no response, the relay agent automatically switches to secondary addresses.

Examples The following example enables the DHCP relay agent to automatically switch to secondary address pools:

```
ip dhcp smart-relay
```

lease

To configure the duration of the lease for an IP address that is assigned from a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server to a DHCP client, use the **lease** DHCP pool configuration command. To restore the default value, use the **no** form of this command.

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

```
no lease
```

Syntax Description

<i>days</i>	Specifies the duration of the lease in numbers of days.
<i>hours</i>	(Optional) Specifies the number of hours in the lease. A <i>days</i> value must be supplied before you can configure an <i>hours</i> value.
<i>minutes</i>	(Optional) Specifies the number of minutes in the lease. A <i>days</i> value and an <i>hours</i> value must be supplied before you can configure a <i>minutes</i> value.
infinite	Specifies the duration of the lease is unlimited.

Defaults

One day

Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Examples

The following example shows a one-day lease:

```
lease 1
```

The following example shows a one-hour lease:

```
lease 0 1
```

The following example shows a one-minute lease:

```
lease 0 0 1
```

The following example shows an infinite (unlimited) lease:

```
lease infinite
```

Related Commands

Command	Description
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.

netbios-name-server

To configure NetBIOS Windows Internet Naming Service (WINS) name servers that are available to Microsoft Dynamic Host Configuration Protocol (DHCP) clients, use the **netbios-name-server** DHCP pool configuration command. To remove the NetBIOS name server list, use the **no** form of this command.

netbios-name-server *address* [*address2...address8*]

no netbios-name-server

Syntax Description	<i>address</i>	Specifies the IP address of the NetBIOS WINS name server. One IP address is required, although you can specify up to eight addresses in one command line.
	<i>address2...address8</i>	(Optional) Specifies up to eight addresses in the command line.

Command Modes DHCP pool configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines One IP address is required, although you can specify up to eight addresses in one command line. Servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

Examples The following example specifies the IP address of a NetBIOS name server available to the client:

```
netbios-name-server 10.12.1.90
```

Related Commands	Command	Description
	dns-server	Specifies the DNS IP servers available to a DHCP client.
	domain-name	Specifies the domain name for a DHCP client.
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.
	netbios-node-type	Configures the NetBIOS node type for Microsoft DHCP clients.

netbios-node-type

To configure the NetBIOS node type for Microsoft Dynamic Host Configuration Protocol (DHCP) clients, use the **netbios-node-type** DHCP pool configuration command. To remove the NetBIOS node type, use the **no** form of this command.

netbios-node-type *type*

no netbios-node-type

Syntax Description

<i>type</i>	Specifies the NetBIOS node type. Valid types are: <ul style="list-style-type: none"> • b-node Broadcast • p-node Peer-to-peer • m-node Mixed • h-node Hybrid (recommended)
-------------	--

Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Usage Guidelines

The recommended type is h-node (hybrid).

Examples

The following example specifies the client's NetBIOS type as hybrid:

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

Related Commands

Command	Description
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.
netbios-name-server	Configures NetBIOS WINS name servers that are available to Microsoft DHCP clients.

network (DHCP)

To configure the subnet number and mask for a Dynamic Host Configuration Protocol (DHCP) address pool on a Cisco IOS DHCP Server, use the **network** DHCP pool configuration command. To remove the subnet number and mask, use the **no** form of this command.

network *network-number* [*mask* | *prefix-length*]

no network

Syntax Description	
<i>network-number</i>	The IP address of the DHCP address pool.
<i>mask</i>	(Optional) The bit combination that renders which portion of the address of the DHCP address pool refers to the network or subnet and which part refers to the host.
<i>prefix-length</i>	(Optional) Specifies the number of bits that comprise the address prefix. The prefix is an alternative way of specifying the network mask of the client. The prefix length must be preceded by a forward slash (/).

Command Modes DHCP pool configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines This command is valid for DHCP subnetwork address pools only. If the mask or prefix length is not specified, the class A, B, or C natural mask is used. The DHCP server assumes that all host addresses are available. The system administrator can exclude subsets of the address space by using the **ip dhcp excluded-address** command.

You can not configure manual bindings within the same pool that is configured with the **network** command.

Examples The following example configures 172.16.0.0/16 as the DHCP pool's subnetwork number and mask:

```
network 172.16.0.0 /16
```

Related Commands	Command	Description
	host	Specifies the IP address and network mask for a manual binding to a DHCP client.
	ip dhcp excluded-address	Specifies IP addresses that a Cisco IOS DHCP Server should not assign to DHCP clients.

Command	Description
network (DHCP)	Configures the subnet number and mask for a DHCP address pool on a Cisco IOS DHCP Server.
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.

next-server

To configure the next server in the boot process of a Dynamic Host Configuration Protocol (DHCP) client, use the **next-server** DHCP pool configuration command. To remove the boot server list, use the **no** form of this command.

```
next-server address [address2...address8]
```

```
no next-server address
```

Syntax Description

<i>address</i>	Specifies the IP address of the next server in the boot process, which is typically a Trivial File Transfer Protocol (TFTP) server. One IP address is required, although you can specify up to eight addresses in one command line.
<i>address2...address8</i>	(Optional) Specifies up to eight addresses in the command line.

Defaults

If the **next-server** command is not used to configure a boot server list, the DHCP server uses inbound interface helper addresses as boot servers.

Command Modes

DHCP pool configuration

Command History

Release	Modification
12.0(1)T	This command was introduced.

Usage Guidelines

You can specify up to eight servers in the list. Servers are listed in order of preference (address1 is the most preferred server, address2 is the next most preferred server, and so on).

Examples

The following example specifies 10.12.1.99 as the IP address of the next server in the boot process:

```
next-server 10.12.1.99
```

Related Commands

Command	Description
bootfile	Specifies the name of the default boot image for a DHCP client.
ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.
ip helper-address	Forwards UDP broadcasts, including BOOTP, received on an interface.
option	Configures Cisco IOS DHCP Server options.

option

To configure Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server options, use the **option** DHCP pool configuration command. To remove the options, use the **no** form of this command.

```
option code [instance number] {ascii string | hex string | ip address}
```

```
no option code [instance number]
```

Syntax Description		
	<i>code</i>	Specifies the DHCP option code.
	<i>instance number</i>	(Optional) Specifies a number from 0 to 255.
	<i>ascii string</i>	Specifies an NVT ASCII character string. ASCII character strings that contain white space must be delimited by quotation marks.
	<i>hex string</i>	Specifies dotted-hexadecimal data. Each byte in hexadecimal character strings is two hexadecimal digits—each byte can be separated by a period, colon, or white space.
	<i>ip address</i>	Specifies an IP address.

Defaults The default instance number is 0.

Command Modes DHCP pool configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines DHCP provides a framework for passing configuration information to hosts on a TCP/IP network. Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message. The data items themselves are also called options. The current set of DHCP options are documented in RFC 2131, *Dynamic Host Configuration Protocol*.

Examples The following example configures DHCP option 19, which specifies whether the client should configure its IP layer for packet forwarding. A value of 0 means disable IP forwarding; a value of 1 means enable IP forwarding. IP forwarding is enabled in the following example:

```
option 19 hex 01
```

The following example configures DHCP option 72, which specifies the World Wide Web servers for DHCP clients. World Wide Web servers 172.16.3.252 and 172.16.3.253 are configured in the following example:

```
option 72 ip 172.16.3.252 172.16.3.253
```

Related Commands	Command	Description
	ip dhcp pool	Configures a DHCP address pool on a Cisco IOS DHCP Server and places you in DHCP pool configuration mode.

service dhcp

To enable the Cisco IOS Dynamic Host Configuration Protocol (DHCP) server and relay agent features on your router, use the **service dhcp** global configuration command. To disable the Cisco IOS DHCP server and relay agent features, use the **no** form of this command.

service dhcp

no service dhcp

Syntax Description This command has no arguments or keywords.

Defaults Enabled

Command Modes Global configuration

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines The BOOTP and DHCP servers in Cisco IOS software both use the ICMP port (port 67) by default. ICMP “port unreachable messages” will only be returned to the sender if both the BOOTP server and DHCP server are disabled. Disabling only one of the servers will not result in ICMP port unreachable messages.

Examples The following example enables DHCP services on the DHCP server:

```
service dhcp
```

show ip dhcp binding

To display address bindings on the Cisco IOS Dynamic Host Configuration Protocol (DHCP) server, use the **show ip dhcp binding** EXEC command.

show ip dhcp binding [*address*]

Syntax Description	<i>address</i>	(Optional) Specifies the IP address of the DHCP client for which bindings will be displayed.
---------------------------	----------------	--

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines	If the address is not specified, all address bindings are shown. Otherwise, only the binding for the specified client is displayed.
-------------------------	---

Examples

The following examples show the DHCP binding address parameters, including an IP address, an associated MAC address, a lease expiration date, and the type of address assignment that have occurred. Table 11 lists descriptions of the fields in each example.

```
Router> show ip dhcp binding 172.16.1.11
```

IP address	Hardware address	Lease expiration	Type
172.16.1.11	00a0.9802.32de	Feb 01 1998 12:00 AM	Automatic

```
Router> show ip dhcp binding 172.16.3.254
```

IP address	Hardware address	Lease expiration	Type
172.16.2.254	02c7.f800.0422	Infinite	Manual

Table 11 *show ip dhcp binding* Field Descriptions

Field	Description
IP address	The IP address of the host as recorded on the DHCP server.
Hardware address	The MAC address or client identifier of the host as recorded on the DHCP server.
Lease expiration	The lease expiration date of the IP address of the host.
Type	The manner in which the IP address was assigned to the host.

■ show ip dhcp binding

Related Commands

Command	Description
clear ip dhcp binding	Deletes an automatic address binding from the Cisco IOS DHCP Server database.

show ip dhcp conflict

To display address conflicts found by a Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server when addresses are offered to the client, use the **show ip dhcp conflict** EXEC command.

show ip dhcp conflict [*address*]

Syntax Description	<i>address</i> (Optional) Specifies the IP address of the conflict found.
---------------------------	---

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Usage Guidelines	The server detects conflicts using ping. The client detects conflicts using gratuitous Address Resolution Protocol (ARP). If an address conflict is detected, the address is removed from the pool and the address will not be assigned until an administrator resolves the conflict.
-------------------------	---

Examples	The following example displays the detection method and detection time for all IP addresses the DHCP server has offered that have conflicts with other devices. Table 12 lists descriptions of the fields in the example.
-----------------	---

```
Router> show ip dhcp conflict
```

```
IP address      Detection Method      Detection time
172.16.1.32     Ping                  Feb 16 1998 12:28 PM
172.16.1.64     Gratuitous ARP        Feb 23 1998 08:12 AM
```

Table 12 *show ip dhcp conflict* Field Descriptions

Field	Description
IP Address	The IP address of the host as recorded on the DHCP server.
Detection Method	The manner in which the IP address of the hosts were found on the DHCP server. Can be a ping or a gratuitous ARP.
Detection time	The time when the conflict was found.

Related Commands	Command	Description
	clear ip dhcp conflict	Clears an address conflict from the Cisco IOS DHCP Server database.
	ip dhcp ping packets	Specifies the number of packets a Cisco IOS DHCP Server sends to a pool address as part of a ping operation.
	ip dhcp ping timeout	Specifies how long a Cisco IOS DHCP Server waits for a ping reply from an address pool.

show ip dhcp database

To display Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server database agent information, use the **show ip dhcp database** Privileged EXEC command.

show ip dhcp database [*url*]

Syntax Description	<i>url</i>	(Optional) Specifies the remote file used to store automatic DHCP bindings. Following are the acceptable URL file formats: <ul style="list-style-type: none"> • tftp://host/filename • ftp://user:password@host/filename • rcp://user@host/filename
---------------------------	------------	--

Defaults	If a URL is not specified, all database agent records are shown. Otherwise, only information about the specified agent is displayed.
-----------------	--

Command Modes	Privileged EXEC
----------------------	-----------------

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Examples	The following example shows all DHCP server database agent information. Table 13 lists descriptions for each field in the example.
-----------------	--

```
Router# show ip dhcp database
```

```

URL       : ftp://user:password@172.16.4.253/router-dhcp
Read      : Dec 01 1997 12:01 AM
Written   : Never
Status    : Last read succeeded. Bindings have been loaded in RAM.
Delay     : 300 seconds
Timeout   : 300 seconds
Failures  : 0
Successes : 1

```

Table 13 *show ip dhcp database Field Descriptions*

Field	Description
URL	Specifies the remote file used to store automatic DHCP bindings. Following are the acceptable URL file formats: <ul style="list-style-type: none"> • tftp://host/filename • ftp://user:password@host/filename • rcp://user@host/filename
Read	The last time bindings were read from the file server.
Written	The last time bindings were written to the file server.
Status	Indication of whether the last read or write of host bindings was successful.
Delay	The amount of time to wait before updating the database.
Timeout	The amount of time before the file transfer is aborted.
Failures	The number of failed file transfers.
Successes	The number of successful file transfers.

Related Commands

Command	Description
ip dhcp database	Configures a Cisco IOS DHCP Server to save automatic bindings on a remote host called a database agent.

show ip dhcp server statistics

To display Cisco IOS Dynamic Host Configuration Protocol (DHCP) Server statistics, use the **show ip dhcp server statistics** EXEC command.

show ip dhcp server statistics

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	12.0(1)T	This command was introduced.

Examples The following example displays DHCP server statistics. Table 14 lists descriptions for each field in the example.

```
Router> show ip dhcp server statistics
```

```
Memory usage          40392
Address pools         3
Database agents      1
Automatic bindings   190
Manual bindings      1
Expired bindings     3
Malformed messages   0

Message              Received
BOOTREQUEST         12
DHCPDISCOVER        200
DHCPRREQUEST        178
DHCPCDECLINE        0
DHCPCRELEASE        0
DHCPCINFORM         0

Message              Sent
BOOTREPLY           12
DHCPCOFFER          190
DHCPCPACK           172
DHCPCNAK            6
```

Table 14 show ip dhcp server statistics Field Descriptions

Field	Description
Memory usage	The number of bytes of RAM allocated by the DHCP server.
Address pools	The number of configured address pools in the DHCP database.

Table 14 *show ip dhcp server statistics Field Descriptions (continued)*

Field	Description
Database agents	The number of database agents configured in the DHCP database.
Automatic bindings	The number of IP addresses that have been automatically mapped to the MAC addresses of hosts that are found in the DHCP database.
Manual bindings	The number of IP addresses that have been manually mapped to the MAC addresses of hosts that are found in the DHCP database.
Expired bindings	The number of expired leases.
Malformed messages	The number of truncated or corrupted messages that were received by the DHCP server.
Message	The DHCP message type that was received by the DHCP server.
Received	The number of DHCP messages that were received by the DHCP server.
Sent	The number of DHCP messages that were sent by the DHCP server.

Related Commands

Command	Description
clear ip dhcp server statistics	Resets all Cisco IOS DHCP Server counters.

■ show ip dhcp server statistics