Configuring DHCP Server

This chapter describes how to configure DHCP server on the Cisco 910 Industrial Routers (*hereafter* referred to as the router).

This chapter consists of these sections:

Understanding DHCP

DHCP is widely used in LAN environments to dynamically assign host IP addresses from a centralized server, which significantly reduces the overhead of administration of IP addresses. DHCP also helps conserve the limited IP address space because IP addresses no longer need to be permanently assigned to hosts; only those hosts that are connected to the network consume IP addresses.

The DHCP server assigns IP addresses from specified address pools on a router or router to DHCP clients and manages them.

DHCP for IPv6 Address Assignment

DHCPv6 enables DHCP servers to pass configuration parameters, such as IPv6 network addresses, to IPv6 clients. The address assignment feature manages nonduplicate address assignment in the correct prefix based on the network where the host is connected. Assigned addresses can be from one or multiple prefix pools. Additional options, such as default domain and DNS name-server address, can be passed back to the client. Address pools can be assigned for use on a specific interface, on multiple interfaces, or the server can automatically find the appropriate pool.

Enabling DHCP Server

Beginning in privileged EXEC mode, follow these steps to enable the DHCP server on the router:

	Command	Purpose
1.	**configure terminal**	Enter global configuration mode.
2.	**service dhcp** *interface-type number*	Enable the DHCP server on the interface.
3.	**exit**	Return to privileged EXEC mode.
4.	**show running-config**	Verify your entries.
5.	**copy running-config startup-config**	(Optional) Save your entries in the configuration file.

To disable the DHCP server, use the **no service dhcp** global configuration command.

Configuring DHCP Server

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Configuring DHCP Server

Beginning in privileged EXEC mode, follow these steps to configure DHCP server.

	Command	Purpose
1.	**configure terminal**	Enter global configuration mode.
2.	**ip dhcp pool**	Create a DHCP server address pool and enters DHCP pool configuration mode. **Note:** If you have changed the parameters of the DHCP server, you must perform a refresh using the **no service dhcp** *interface-type number* command and **service dhcp** *interface-type number* commands.
3.	**network** *network-number mask*	Specify the subnet network number and mask of the DHCP address pool.
4.	**domain-name** *domain*	Specify the domain name for the client.
5.	**dns-server** *address*	Specify the IP address of a DNS server that is available to a DHCP client.
6.	**default-router** *address*	Specify the IP address of the default router for a DHCP client.
7.	**exit**	Return to privileged EXEC mode.
8.	**service dhcp** *interface-type number*	Enable DHCP server on the interface.

The following example configures the DHCP server:

```
Router# configure terminal
Router(config)# ip dhcp included-address 192.168.1.101 192.168.1.150
Router(config)# ip dhcp pool
Router(dhcp-config)# network 192.168.1.0 255.255.255.0
Router(dhcp-config)# domain-name cisco.com
Router(dhcp-config)# dns-server 8.8.8.8
Router(dhcp-config)# default-router 192.168.1.1
Router(dhcp-config)# exit
Router(config)# service dhcp vlan1
```

Configuring Stateful DHCPv6 Server

Beginning in privileged EXEC mode, follow these steps to configure stateful DHCPv6 server.

	Command	Purpose
1.	**configure terminal**	Enter global configuration mode.
2.	**ip dhcp pool**	Create a DHCP server address pool and enters DHCP pool configuration mode. **Note:** If you have changed the parameters of the DHCP server, you must perform a refresh using the **no service dhcp** *interface-type number* command and **service dhcp** *interface-type number* commands.
3.	**address prefix** *ipv6-prefix*	Specify an address prefix for address assignment.
4.	**domain-name** *domain*	Specify the domain name for the DHCPv6 client.
5.	**dns-server** *ipv6-address*	Specify the DNS IPv6 servers available to a DHCPv6 client.
6.	**exit**	Return to privileged EXEC mode.
7.	**ipv6 dhcp included-address** *low-address high-address*	Specify the IP addresses that the DHCPv6 server should assign to DHCPv6 clients.
8.	**interface** *type number*	Specify an interface type and number, and enters the interface configuration mode.
9.	**ipv6 dhcp server**	Enable DHCPv6 on an interface.

The following example configures the stateful DHCPv6 server:

```
Router(config)# ipv6 dhcp pool
Router(config-dhcpv6)# address prefix 2001:DB8:1001::0/64
Router(config-dhcpv6)# domain-name cisco.com
Router(config-dhcpv6)# dns-server 2001:DB8:1001::1
Router(config-dhcpv6)# exit
Router(config)# ipv6 dhcp included-address 2001:DB8:1001::100 2001:DB8:1001::200
Router(config)# interface Vlan 1
Router(config-if)# ipv6 dhcp server
```

Configuring Stateless DHCPv6 Server

Beginning in privileged EXEC mode, follow these steps to configure stateless DHCPv6 server.

	Command	Purpose
1.	**configure terminal**	Enter global configuration mode.
2.	**ipv6 nd managed-config-flag**	Set the " managed address configuration flag" in IPv6 router advertisements.
3.	ipv6 nd prefix	Set the IPv6 prefix which is included in IPv6 Neighbor Discovery (ND) router advertisements.

The following example configures the stateless DHCPv6 server:

```
Router(config)# interface Vlan 1
```

```
Router(config-if)# ipv6 nd managed-config-flag
Router(config-if)# ipv6 nd prefix 2001:DB8:1001::0/64
```

Displaying DHCP Server Address Bindings

To display the DHCP server address binding information, use the privileged EXEC command in Table 4:

Table 4   Commands for Displaying DHCP Address Bindings

Command	Purpose
show ip dhcp binding	Display address bindings on the DHCP server.

The following example is a sample output of the **show ip dhcp binding** command:

```
Router# show ip dhcp binding

IP address     Hardware address     Lease expiration
10.0.1.60      88:75:56:27:32:01     2000/01/01 17:37:12
```