

DHCP Vendor Option Support

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Feature history for DHCP vendor option support

Table 1: Feature History Table

Feature Name	Release Information	Description
DHCP Option Support	Cisco IOS XE Catalyst SD-WAN Release 16.12.1b	This feature allows DHCP server options, 43 and 191 to configure vendor-specific information in client-server exchanges.
DHCP vendor option support	Cisco IOS XE Catalyst SD-WAN Release 17.10.1a Cisco Catalyst SD-WAN Control Components Release 20.10.1	This feature allows DHCP client option 124 and option 125 to configure vendor-specific information in client-server exchanges. Configure this feature using the CLI Add-on feature template in Cisco SD-WAN Manager.

DHCP vendor option support

A configurable dynamic host configuration protocol (DHCP) client is a network client feature that:

- allows use of user-specified client or class identifiers,
- supports suggestion of lease time during address requests, and
- enables configuration of vendor-class and vendor-specific information with Option 124 and Option 125.

This functionality provides flexibility for DHCP clients when requesting addresses and enables differential services, device classification, and feature enablement.

DHCP client options

The DHCP client provides flexibility by allowing the following options to be configured for a DHCP client:

- Option 124—This option is used by DHCP clients and servers to exchange vendor-class information.
- Option 125—This option is used by DHCP clients and servers to exchange vendor-specific information.

These options are used by Zero-Touch Provisioning (ZTP), Cisco Plug-and-Play (PnP), and Identity Services Engine (ISE) to support multiple use cases.

For example, the content of Option 124 is used for device classification and enabling solution-specific features.

The DHCP Vendor Option Support feature introduces new CLI parameters to make Option 124 and Option 125 flexible. You can modify and customize enabling vendor specific options to carry different values for different customer features. The combination of Option 124 and Option 125 enables various features.

The **ip dhcp client vendor-class** command provides flexibility to pack either Device PID or MAC Address of the DHCP client or any user configurable string in option-124. The default behavior for this command is to continue to send device PID when you choose option 124.

This default behavior can be overridden to carry MAC Address in Day 1 configuration mode by explicitly requesting option-125 from the server using the **ip dhcp client vendor-class** command.

By default, Cisco IOS XE DHCP client sends the following data:

Attribute	IPv4 DHCP Option	Default Value
Vendor-Identifying Vendor Class Option	124	PID



Note The **ip dhcp client vendor-class [mac-address | ascii | disable | hex]** command overrides PID with MAC Address / user defined string / disable Option 124.

DHCPv6 Client Options

Configuration parameters and other control information are carried in tagged data items that are stored in the options field of the DHCP message.

The DHCP client provides flexibility by allowing the following options to be configured for a DHCP client:

- Option 16—This option is used by DHCP clients and servers to exchange vendor-class information.
- Option 17—This option is used by DHCP clients and servers to exchange vendor-specific information

In DHCPv6, option-16 and option-17 are used by DHCP clients and servers to exchange vendor-specific information.

The **ipv6 dhcp client vendor-class** command provides flexibility to pack either Device PID or MAC Address of the DHCP Client or any user configurable string in option-16.

The default behavior for this command is to continue to send device PID when you choose option-16 but it can be overridden to carry MAC Address in Day 1 configuration mode using the **ipv6 dhcp client vendor-class** command.

By default, Cisco IOS XE DHCP client sends the following data:

Attribute	IPv4 DHCP Option	Default Value
Vendor Class Option	16	PID



Note The **ipv6 dhcp client vendor-class [mac-address | hex | ascii | disable]** command can be used to override default value of PID with MAC Address or User defined string or disable the option.

Configure a DHCP vendor option using CLI command

This section provides a sample CLI configuration to configure a DHCP vendor option.

For more information about using CLI templates, see CLI Add-On Feature Templates.

Before you begin

By default, CLI templates execute commands in global config mode.

Procedure

Step 1 Configure an interface type and enter the interface configuration mode.

Example:

```
interface type number
```

Step 2 Acquire an IP address on an interface from DHCP.

Example:

```
ip address dhcp
```

Step 3 Configure the DHCP vendor-class option.

Example:

```
ip dhcp client vendor-class [mac-address | ascii | hex | disable]
```

Note
You must first configure the **no ip dhcp-client** command before configuring the IP address.

Override the device PID with MAC address:

The DHCP vendor-class option overrides the device PID with the MAC Address.

```
interface GigabitEthernet 0/0/0
    ip address dhcp
    ip dhcp client vendor-class mac-address
    !
```

Override the device PID with user defined string in hex or in ascii format:

```
interface GigabitEthernet 0/0/0
    ip address dhcp
    ip dhcp client vendor-class hex aabbcc
    !

interface GigabitEthernet 0/0/0
    ip address dhcp
    ip dhcp client vendor-class ascii cisco
    !
```

Disable option-124 in DHCP messages:

```
interface GigabitEthernet 0/0/0
    ip address dhcp
    ip dhcp client vendor-class disable
    !
```

Configure a DHCPv6 client option option using a CLI template

By default, CLI templates execute commands in global config mode.

For more information about using CLI templates, see *CLI Add-On Feature Templates* in the *Cisco Catalyst SD-WAN Systems and Interfaces Configuration Guide, Cisco IOS XE Catalyst SD-WAN Release 17.x*.

The section provides a sample CLI configuration to configure DHCPv6 client option.

Procedure

Step 1 Configure an interface type and enter the interface configuration mode.

Example:

```
interface type number
```

Step 2 Acquire an IPv6 address on an interface from DHCP.

Example:

```
ipv6 address dhcp
```

Step 3 Configure the DHCP vendor-class option.

Example:

```
ipv6 dhcp client vendor-class {mac-address | ascii | hex | disable}
```

Note
By default, the DHCPv6 client carries the device PID of the device in option-16.

This default behaviour can be overridden by configuring the **ipv6 dhcp client vendor-class** command.

Override the device PID with the MAC address:

The DHCP vendor-class option overrides the Device PID with the MAC Address.

```
interface GigabitEthernet 0/0/0
    ipv6 address dhcp
    ipv6 dhcp client vendor-class mac-address
    !
```

Override the device PID with user defined string in hex or in ascii format:

```
interface GigabitEthernet 0/0/0
    ipv6 address dhcp
    ipv6 dhcp client vendor-class hex aabbcc
    !

interface GigabitEthernet 0/0/0
    ipv6 address dhcp
    ipv6 dhcp client vendor-class ascii cisco
    !
```

Disable option-16 in DHCP messages:

```
interface GigabitEthernet 0/0/0
    ipv6 address dhcp
    ipv6 dhcp client vendor-class disable
    !
```

Configure DHCP server using templates

To configure a Cisco IOS XE Catalyst SD-WAN device to act as a DHCP server using Cisco SD-WAN Manager templates:

1. Create a DHCP-Server feature template to configure DHCP server parameters, as described in this topic.
2. Create one or more interface feature templates, as described in the VPN-Interface-Ethernet and the VPN-Interface-PPP-Ethernet sections.
3. Create a VPN feature template to configure VPN parameters.

To configure a Cisco IOS XE Catalyst SD-WAN device interface as a DHCP helper to broadcast DHCP requests from DHCP servers, in the **DHCP Helper** field of the applicable interfaces template, enter the addresses of the DHCP servers.

Use the DHCP-Server template for all Cisco Catalyst SD-WANs.

You enable DHCP server functionality on a Cisco IOS XE Catalyst SD-WAN device interface so it can assign IP addresses to hosts in the service-side network.

Procedure

Step 1 From the Cisco SD-WAN Manager menu, choose **Configuration** > **Templates**.

Step 2 Click **Device Templates**, and then click **Create Template**.

In Cisco vManage Release 20.7.1 and earlier releases, **Device Templates** is titled **Device**.

a) From the **Create Template** drop-down list, choose **From Feature Template**.
b) From the **Device Model** drop-down list, select the type of device for which you are creating the template.
c) Click **Service VPN** or scroll to the **Service VPN** section.
d) From **Additional VPN Templates**, click **VPN Interface**.
e) From the **Sub-Templates** drop-down list, choose DHCP Server.
f) From the **DHCP Server** drop-down list, click **Create Template**. The DHCP-Server template form is displayed.

This form contains fields for naming the template, and fields for defining the DHCP Server parameters.

g) In **Template Name**, enter a name for the template.

The name can be up to 128 characters and can contain only alphanumeric characters.

h) In **Template Description**, enter a description of the template.

The description can be up to 2048 characters and can contain only alphanumeric characters.

When you first open a feature template, for each parameter that has a default value, the scope is set to Default (indicated by a check mark), and the default setting or value is shown. To change the default or to enter a value, click the **Scope** drop-down list.

Step 3 Configure DHCP basic server functionality.

Table 2:

Parameter Name	Description
Address Pool*	Enter the IPv4 prefix range, in the format *prefix/length*, for the pool of addresses in the service-side network for which the router interface acts as DHCP server.
Exclude Addresses	Enter one or more IP addresses to exclude from the DHCP address pool. To specify multiple individual addresses, list them separated by a comma. To specify a range of addresses, separate them with a hyphen.
Maximum Leases	Specify the number of IP addresses that can be assigned on this interface. Range: 0 through 4294967295
Lease Time	Specify how long a DHCP-assigned IP address is valid. Range: 0 through 4294967295 seconds

Parameter Name	Description
Offer Time	Specify how long the IP address offered to a DHCP client is reserved for that client. By default, an offered IP address is reserved indefinitely, until the DHCP server runs out of addresses. At that point, the address is offered to another client. Range: 0 through 4294967295 seconds Default: 600 seconds
Administrative State	Select Up to enable or Down to disable the DHCP functionality on the interface. By default, DHCP server functionality is disabled on an interface.

Step 4 Configure a static lease to assign a static IP address to a client device on the service-side network.

Table 3:

Parameter Name	Description
MAC Address	Enter the MAC address of the client to which the static IP address is being assigned.
IP Address	Enter the static IP address to assign to the client.
Hostname	Enter the hostname of the client device.

To edit a static lease, click **pencil** icon.

To remove a static lease, click **trash** icon.

To save the feature template, click **Save**.

Step 5 Configure advanced DHCP server options

Table 4:

Parameter Name	Description
Interface MTU	Specify the maximum MTU size of packets on the interface. Range: 68 to 65535 bytes
Domain Name	Specify the domain name that the DHCP client uses to resolve hostnames.
Default Gateway	Enter the IP address of a default gateway in the service-side network.
DNS Servers	Enter one or more IP address for a DNS server in the service-side network. Separate multiple entries with a comma. You can specify up to eight addresses.
TFTP Servers	Enter the IP address of a TFTP server in the service-side network. You can specify one or two addresses. If two, separate them with a comma.