DHCP Option82

Information About DHCP Option 82

DHCP Option 82 is organized as a single DHCP option that contains information known by the relay agent. This feature provides additional security when DHCP is used to allocate network addresses, and enables the Cisco controller to act as a DHCP relay agent to prevent DHCP client requests from untrusted sources.

The controller can be configured to add Option 82 information to DHCP requests from clients before forwarding the requests to a DHCP server. The DHCP server can then be configured to allocate IP addresses to the wireless client based on the information present in DHCP Option 82.

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. Option 82 contains information known by the relay agent.

The Relay Agent Information option is organized as a single DHCP option that contains one or more suboptions that convey information known by the relay agent. Option 82 was designed to allow a DHCP Relay Agent to insert circuit−specific information into a request that is being forwarded to a DHCP server. This option works by setting two suboptions:

- Circuit ID

- Remote ID

The Circuit ID suboption includes information that is specific to the circuit the request came in on. This suboption is an identifier that is specific to the relay agent. Thus, the circuit that is described will vary depending on the relay agent.

The Remote ID suboption includes information on the remote host–end of the circuit. This suboption usually contains information that identifies the relay agent. In a wireless network, this would likely be a unique identifier of the wireless access point.

Note All valid Remote ID combinations are separated with a colon (:) as the delimiter.

You can configure the following DHCP Option 82 options in a controller :

- DHCP Enable

- DHCP Opt82 Enable

- DHCP Opt82 Ascii

- DHCP Opt82 RID

- DHCP Opt Format

- DHCP AP MAC

- DHCP SSID

- DHCP AP ETH MAC

- DHCP AP NAME

- DHCP Site Tag

- DHCP AP Location

- DHCP VLAN ID

Note The controller includes the SSID in ASCII and the VLAN-ID in hexadecimal format within the remote-ID sub-option of option 82 in the outgoing DHCP packets to the server for the following configurations:

```
ipv4 dhcp opt82 format ssid
ipv4 dhcp opt82 format vlan-id
```

However, if *ipv4 dhcp opt82 ascii* configuration is also present, the controller adds VLAN-ID and SSID in ASCII format.

For Cisco Catalyst 9800 Series Configuration Best Practices, see the following link: https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9800-series-wireless-controllers/guide-c07-743627.html

Configuring DHCP Option 82 Global Interface

Configuring DHCP Option 82 Globally Through Server Override (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**ip dhcp-relay information option server-override** **Example:** Device(config)# **ip dhcp-relay information option server-override**	Inserts global server override and link selection suboptions.

Configuring DHCP Option 82 Through Server Override (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# configure terminal	Enters global configuration mode.
Step 2	**ip dhcp compatibility suboption server-override** [**cisco** | **standard**] **Example:** Device(config)# ip dhcp compatibility suboption server-override cisco	Configures the server override suboption to an RFC or Cisco specific value.
Step 3	**ip dhcp compatibility suboption link-selection** [**cisco** | **standard**] **Example:** Device(config)# ip dhcp compatibility suboption link-selection cisco	Configures the link-selection suboption to an RFC or Cisco specific value.

Configuring DHCP Option 82 Globally Through Different SVIs (GUI)

Procedure

Step 1	Choose **Configuration > VLAN**.
Step 2	Choose a VLAN from the drop-down list.
	The **Edit SVI** window appears.
Step 3	Click the **Advanced** tab.
Step 4	Choose an option from the **IPv4 Inbound ACL** drop-down list.
Step 5	Choose an option from the **IPv4 Outbound ACL** drop-down list.
Step 6	Choose an option from the **IPv6 Inbound ACL** drop-down list.
Step 7	Choose an option from the **IPv6 Outbound ACL** drop-down list.
Step 8	Enter an IP address in the **IPv4 Helper Address** field.
Step 9	Set the status to **Enabled** if you want to enable the **Relay Information Option** setting.
Step 10	Enter the **Subscriber ID**.
Step 11	Set the status to **Enabled** if you want to enable the **Server ID Override** setting.
Step 12	Set the status to **Enabled** if you want to enable the **Option Insert** setting.
Step 13	Choose an option from the **Source-Interface Vlan** drop-down list.
Step 14	Click **Update & Apply to Device**.

Configuring DHCP Option 82 Globally Through Different SVIs (CLI)

Procedure

	Command or Action	**Purpose**
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**ip dhcp-relay source-interface vlan** *vlan-id* **Example:** Device(config)# **ip dhcp-relay source-interface vlan 74**	Sets global source interface for relayed messages.

Configuring DHCP Option 82 Format

Procedure

	Command or Action	**Purpose**
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**wireless profile policy** *policy-name* **Example:** Device(config)# **wireless profile policy** *pp3*	Enables configuration for the specified profile policy.
Step 3	**shutdown** **Example:** Device(config-wireless-policy)# **shutdown**	Shuts down the profile policy.
Step 4	**vlan** *vlan-name* **Example:** Device(config-wireless-policy)# **vlan 72**	Assigns the profile policy to a VLAN.
Step 5	**session-timeout** *value-btwn-20-86400* **Example:** Device(config-wireless-policy)# **session-timeout 300**	(Optional) Sets the session timeout value in seconds. The range is between 20-86400.
Step 6	**idle-timeout** *value-btwn-15-100000* **Example:** Device(config-wireless-policy)# **idle-timeout 15**	(Optional) Sets the idle timeout value in seconds. The range is between 15-100000.
Step 7	**central switching** **Example:** Device(config-wireless-policy)# **central switching**	Enables central switching.
Step 8	**ipv4 dhcp opt82** **Example:** Device(config-wireless-policy)# **ipv4 dhcp opt82**	Enables DHCP Option 82 for the wireless clients.
Step 9	**ipv4 dhcp opt82 ascii** **Example:**	(Optional) Enables ASCII on the DHCP Option 82 feature.

	Command or Action	Purpose
	Device(config-wireless-policy)# **ipv4 dhcp opt82 ascii**	
Step 10	**ipv4 dhcp opt82 rid** **Example:** Device(config-wireless-policy)# **ipv4 dhcp opt82 rid**	(Optional) Supports the addition of Cisco 2 byte Remote ID (RID) for the DHCP Option 82 feature.
Step 11	**ipv4 dhcp opt82 format** **{ap_ethmac|ap_location|apmac|apname|policy_tag|ssid|vlan_id}** **Example:** Device(config-wireless-policy)# **ipv4 dhcp opt82 format apmac**	Enables DHCP Option 82 on the corresponding AP. For information on the various options available with the command, see Cisco Catalyst 9800 Series Wireless Controller Command Reference.
Step 12	**no shutdown** **Example:** Device(config-wireless-policy)# **no shutdown**	Enables the profile policy.

Configuring DHCP Option82 Through a VLAN Interface

Configuring DHCP Option 82 Through Option-Insert Command (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**interface vlan** *vlan-id* **Example:** Device(config)# **interface vlan 72**	Configures a VLAN ID.
Step 3	**ip dhcp relay information option-insert** **Example:** Device(config-if)# **ip dhcp relay information option-insert**	Inserts relay information in BOOTREQUEST.
Step 4	**ip address** *ip-address* **Example:**	Configures the IP address for the interface.

	Command or Action	Purpose
	Device(config-if)# **ip address 9.3.72.38 255.255.255.0**	
Step 5	**ip helper-address** *ip-address* **Example:** Device(config-if)# **ip helper-address 9.3.72.1**	Configures the destination address for UDP broadcasts.
Step 6	**[no] mop enabled** **Example:** Device(config-if)# **no mop enabled**	Disables the MOP for an interface.
Step 7	**[no] mop sysid** **Example:** Device(config-apgroup)# **[no] mop sysid**	Disables the task of sending MOP periodic system ID messages.

Configuring DHCP Option 82 Through the server-ID-override Command (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**ip dhcp compatibility suboption server-override cisco** **Example:** Device(config)# ip dhcp compatibility suboption server-override cisco	Configures the server-id override suboption to an RFC or Cisco specific value.
Step 3	**ip dhcp compatibility suboption link-selection cisco** **Example:** Device(config)# ip dhcp compatibility suboption link-selection cisco	Configures the link-selection suboption to an RFC or Cisco specific value.
Step 4	**interface vlan** *vlan-id* **Example:** Device(config)# **interface vlan 72**	Configures a VLAN ID.
Step 5	**ip dhcp relay information option server-id-override** **Example:**	Inserts the server id override and link selection suboptions.

	Command or Action	Purpose
	Device(config-if)# **ip dhcp relay information option server-id-override**	
Step 6	**ip address** *ip-address* **Example:** Device(config-if)# **ip address 9.3.72.38 255.255.255.0**	Configures the IP address for the interface.
Step 7	**ip helper-address** *ip-address* **Example:** Device(config-if)# **ip helper-address 9.3.72.1**	Configures the destination address for UDP broadcasts.
Step 8	**[no] mop enabled** **Example:** Device(config-if)# **no mop enabled**	Disables MOP for an interface.
Step 9	**[no] mop sysid** **Example:** Device(config-if)# **[no] mop sysid**	Disables the task of sending MOP periodic system ID messages.

Configuring DHCP Option 82 Through a Subscriber-ID (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**interface vlan** *vlan-id* **Example:** Device(config)# **interface vlan 72**	Configures a VLAN ID.
Step 3	**ip dhcp relay information option subscriber-id** *subscriber-id* **Example:** Device(config-if)# **ip dhcp relay information option subscriber-id test10**	Inserts the subscriber identifier suboption.
Step 4	**ip address** *ip-address* **Example:**	Configures the IP address for the interface.

	Command or Action	Purpose
	Device(config-if)# **ip address 9.3.72.38 255.255.255.0**	
Step 5	**ip helper-address** *ip-address* **Example:** Device(config-if)# **ip helper-address 9.3.72.1**	Configures the destination address for UDP broadcasts.
Step 6	**[no] mop enabled** **Example:** Device(config-if)# **no mop enabled**	Disables MOP for an interface.
Step 7	**[no] mop sysid** **Example:** Device(config-apgroup)# **[no] mop sysid**	Disables the task of sending MOP periodic system ID messages.

Configuring DHCP Option 82 Through server-ID-override and subscriber-ID Commands (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** Device# **configure terminal**	Enters global configuration mode.
Step 2	**interface vlan** *vlan-id* **Example:** Device(config)# **interface vlan 72**	Configures a VLAN ID.
Step 3	**ip dhcp relay information option server-id-override** **Example:** Device(config-if)# **ip dhcp relay information option server-id-override**	Inserts server ID override and link selection suboptions.
Step 4	**ip dhcp relay information option subscriber-id** *subscriber-id* **Example:** Device(config-if)# **ip dhcp relay information option subscriber-id test10**	Inserts the subscriber identifier suboption.

	Command or Action	Purpose
Step 5	**ip address** *ip-address* **Example:** `Device(config-if)# ip address 9.3.72.38 255.255.255.0`	Configures the IP address for the interface.
Step 6	**ip helper-address** *ip-address* **Example:** `Device(config-if)# ip helper-address 9.3.72.1`	Configures the destination address for UDP broadcasts.
Step 7	**[no] mop enabled** **Example:** `Device(config-if)# no mop enabled`	Disables the MOP for an interface.
Step 8	**[no] mop sysid** **Example:** `Device(config-apgroup)# [no] mop sysid`	Disables the task of sending MOP periodic system ID messages.

Configuring DHCP Option 82 Through Different SVIs (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**interface vlan** *vlan-id* **Example:** `Device(config)# interface vlan 72`	Configures a VLAN ID.
Step 3	**ip dhcp relay source-interface vlan** *vlan-id* **Example:** `Device(config-if)# ip dhcp relay source-interface vlan 74`	Configures a source interface for relayed messages on a VLAN ID.
Step 4	**ip address** *ip-address* **Example:** `Device(config-if)# ip address 9.3.72.38 255.255.255.0`	Configures the IP address for the interface.

	Command or Action	Purpose

Step 5	**ip helper-address** *ip-address*
	
	Example:
	`Device(config-if)# ip helper-address`
	`9.3.72.1`
		Configure the destination address for UDP broadcasts.

Step 6	**[no] mop enabled** **Example:** `Device(config-if)# no mop enabled`	Disables the MOP for an interface.
Step 7	**[no] mop sysid** **Example:** `Device(config-apgroup)# [no] mop sysid`	Disables the task of sending MOP periodic system ID messages.

Information About AP DHCP Option 82 Support on FlexConnect Local Switching Mode

The DHCP Option 82 provides additional information on the physical attachment of the client. It enhances security while using DHCP for network address allocation.

The AP DHCP Option82 Support on FlexConnect Local Switching Mode feature enables the AP to act as a DHCP relay agent to prevent DHCP client requests from unreliable sources. As a DHCP relay agent, the AP can add DHCP Option 82 information such as AP MAC, AP Name, and SSID to DHCP requests from clients before forwarding the requests to the DHCP server. Afterward, the DHCP servers can allocate IP addresses to wireless clients based on the data contained within DHCP Option 82.

This feature is supported only in FlexConnect Local Switching mode.

Configuring AP DHCP Option82 Support

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

Step 2	**wireless profile policy** *policy-name*
	
	Example:
	`Device(config)# wireless profile policy`
	` policy-ap`
		Enables configuration for the specified profile policy.

	Command or Action	Purpose
Step 3	**shutdown** **Example:** Device(config-wireless-policy)# shutdown	Shuts down the profile policy.
Step 4	**ipv4 dhcp opt82 format** {**apmac** | **apname**} **Example:** Device(config-wireless-policy)# ipv4 dhcp opt82 format apmac	Configures the AP MAC address or the AP name format to be added to DHCP requests from clients before forwarding them to the DHCP server. You can use either **apmac** or **apname**, but not both.
Step 5	**ipv4 dhcp opt82 format ssid** **Example:** Device(config-wireless-policy)# ipv4 dhcp opt82 format ssid	Configures the unique SSID format to be added to DHCP requests from clients before forwarding them to the DHCP server.
Step 6	**no shutdown** **Example:** Device(config-wireless-policy)# **no shutdown**	Enables the profile policy.

Verifying AP DHCP Option82 Support

To verify the configured parameters for DHCP Option82, use the following command on the AP console:

Note You can fetch information about the WLAN and WLAN ID using the **show flexconnect wlan** command.

```
Device# show flexconnect dhcp option-82 wlan 1

DHCP OPTION 82 CONFIG FOR WLAN:
VAP ID     :0
Format     :Binary
Delimiter  :":"
Circuit-ID :
Remote-ID  :
    AP Name
    SSID-Name
```

To verify whether DHCP Option82 is enabled on the controller, use the following command:

```
Device# show wireless profile policy detailed

Opt82
  SSID                    : ENABLED
  AP_ETHMAC               : DISABLED
  APNAME                  : ENABLED
```