



DHCP for WLANs

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

Information About the Dynamic Host Configuration Protocol

You can configure WLANs to use the same or different Dynamic Host Configuration Protocol (DHCP) servers or no DHCP server. Two types of DHCP servers are available: internal and external.

Internal DHCP Servers

The devices contain an internal DHCP server. This server is typically used in branch offices that do not already have a DHCP server. The wireless network generally contains a maximum of 10 APs or less, with the APs on the same IP subnet as the device. The internal server provides DHCP addresses to wireless clients, direct-connect APs, and DHCP requests that are relayed from APs. Only lightweight access points are supported. When you want to use the internal DHCP server, you must set the management interface IP address of the device as the DHCP server IP address.

DHCP option 43 is not supported on the internal server. Therefore, the access point must use an alternative method to locate the management interface IP address of the device, such as local subnet broadcast, Domain Name System (DNS), or priming.

An internal DHCP server pool only serves the wireless clients of that device, not clients of other devices. Also, an internal DHCP server can serve only wireless clients, not wired clients.

When clients use the internal DHCP server of the device, IP addresses are not preserved across reboots. As a result, multiple clients can be assigned to the same IP address. To resolve any IP address conflicts, clients must release their existing IP address and request a new one. Wired guest clients are always on a Layer 2 network connected to a local or foreign device.



Note

- VRF is not supported in the internal DHCP servers.
 - DHCPv6 is not supported in the internal DHCP servers.
-

General Guidelines

External DHCP Servers

The operating system is designed to appear as a DHCP Relay to the network and as a DHCP server to clients with industry-standard external DHCP servers that support DHCP Relay, which means that each device appears as a DHCP Relay agent to the DHCP server and as a DHCP server at the virtual IP address to wireless clients.

Because the device captures the client IP address that is obtained from a DHCP server, it maintains the same IP address for that client during intra device, inter device, and inter-subnet client roaming.



Note

External DHCP servers can support DHCPv6.

DHCP Assignments

You can configure DHCP on a per-interface or per-WLAN basis. We recommend that you use the primary DHCP server address that is assigned to a particular interface.

You can assign DHCP servers for individual interfaces. You can configure the management interface, AP-manager interface, and dynamic interface for a primary and secondary DHCP server, and you can configure the service-port interface to enable or disable DHCP servers. You can also define a DHCP server on a WLAN. In this case, the server overrides the DHCP server address on the interface assigned to the WLAN.

Security Considerations

For enhanced security, we recommend that you require all clients to obtain their IP addresses from a DHCP server. To enforce this requirement, you can configure all WLANs with a DHCP Addr. Assignment Required setting, which disallows client static IP addresses. If DHCP Addr. Assignment Required is selected, clients must obtain an IP address via DHCP. Any client with a static IP address is not allowed on the network. The device monitors DHCP traffic because it acts as a DHCP proxy for the clients.



- Note**
- WLANs that support management over wireless must allow management (device-servicing) clients to obtain an IP address from a DHCP server.

If slightly less security is tolerable, you can create WLANs with DHCP Addr. Assignment Required disabled. Clients then have the option of using a static IP address or obtaining an IP address from a designated DHCP server.



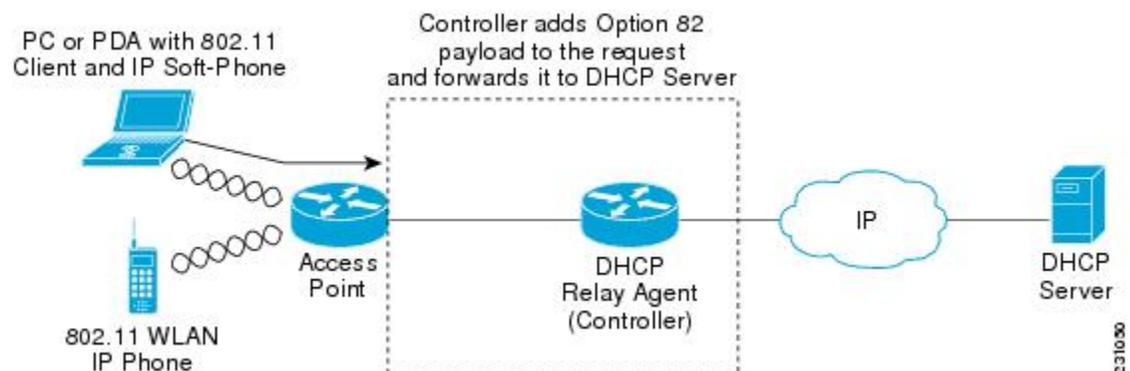
- Note** DHCP Addr. Assignment Required is not supported for wired guest LANs.

You can create separate WLANs with DHCP Addr. Assignment Required configured as disabled. This is applicable only if DHCP proxy is enabled for the device. You must not define the primary/secondary configuration DHCP server you should disable the DHCP proxy. These WLANs drop all DHCP requests and force clients to use a static IP address. These WLANs do not support management over wireless connections.

Information About DHCP Option 82

DHCP option 82 provides additional security when DHCP is used to allocate network addresses. It enables the device to act as a DHCP relay agent to prevent DHCP client requests from untrusted sources. You can configure the device to add option 82 information to DHCP requests from clients before forwarding the requests to the DHCP server.

Figure 1: DHCP Option 82



The access point forwards all DHCP requests from a client to the device. The device adds the DHCP option 82 payload and forwards the request to the DHCP server. The payload can contain the MAC address or the MAC address and SSID of the access point, depending on how you configure this option.



- Note** Any DHCP packets that already include a relay agent option are dropped at the device.

For DHCP option 82 to operate correctly, DHCP proxy must be enabled.

Configuring DHCP Scopes

Information About Internal DHCP Server

Devices have built-in DHCP relay agents. However, when you desire network segments that do not have a separate DHCP server, the devices can have built-in internal DHCP server that assign IP addresses and subnet masks to wireless clients. Typically, one device can have one or more internal DHCP server that each provide a range of IP addresses.

Internal DHCP server are needed for internal DHCP to work. Once DHCP is defined on the device, you can then point the primary DHCP server IP address on the management, AP-manager, and dynamic interfaces to the device's management interface.



Note The controller has the ability to provide internal DHCP server. This feature is very limited and considered as convenience that is often used simple demonstration or proof-of-concept, for example in a lab environment. The best practice is NOT to use this feature in an enterprise production network.

Read more about this at: <http://www.cisco.com/c/en/us/support/docs/wireless/4400-series-wireless-lan-controllers/110865-dhcp-wlc.html#anc16>

Prerequisites for Configuring DHCP for WLANs

- To be able to use the DHCP option 82, you must configure DHCP on Cisco IOS software. By default, DHCP option 82 is enabled for all clients. You can control the wireless client behavior using the WLAN suboptions.
- The Cisco converged access platforms support internal DHCP server functionality. However, as a general deployment guideline to build large enterprise-class networks, we recommend that you use external DHCP server to provide dynamic IP addressing to wireless clients. Such distributed function reduces processing and configuration load on network devices and allows them to operate efficiently in large scale deployments.
- DHCP Snooping Configuration—DHCP snooping configuration is the required best practices configuration on for rapid client join function. DHCP snooping needs to be enabled on each client VLAN including the override VLAN if override is applied on the WLAN.

Example of DHCP snooping configuration

1. Global DHCP snooping configuration:

a. `Device(config)#ip dhcp snooping`

`Device(config)#ip dhcp snooping vlan 100`

b. Enable `bootp-broadcast` command. This is required for clients that send DHCP messages with broadcast addresses and broadcast bit is set in the DHCP message:

`Device(config)#ip dhcp snooping wireless bootp-broadcast enable`

c. To not append DHCP Option information, enter this command:

`Device(config)#no ip dhcp snooping information option`

2. On the interface:



Note IP DHCP snooping trust is required on Port-Channel interface in addition to member link of the Port-Channel interface.

```
Device(config)#interface range TenGigabitEthernet 1/0/1 - 2
```

```
Device(config-if)#switchport mode trunk
```

```
Device(config-if)#switchport trunk allowed vlan 100
```

```
Device(config-if)#ip dhcp snooping trust
```

```
Device(config)#interface port-channel 1
```

```
Device(config-if)#switchport mode trunk
```

```
Device(config-if)#switchport trunk allowed vlan 100
```

```
Device(config-if)#ip dhcp snooping trust
```



Note DHCP snooping must be configured on the Guest Anchor for guest access similar to the Config above.

Restrictions for Configuring DHCP for WLANs

- If you override the DHCP server in a WLAN, you must ensure that you configure the underlying Cisco IOS configuration to make sure that the DHCP server is reachable.
- WLAN DHCP override works only if DHCP service is enabled on the device.

You can configure DHCP service in either of the following ways:

- Configuring the DHCP pool on the device.
- Configuring a DHCP relay agent on the SVI. Note: the VLAN of the SVI must be mapped to the WLAN where DHCP override is configured.

How to Configure DHCP for WLANs

Configuring DHCP for WLANs (CLI)

Use this procedure to configure the following DHCP parameters on a WLAN:

- DHCP Option 82 Payload

- DHCP Required
- DHCP Override

Before you begin

- You must have admin privileges for configuring the WLAN.
- To configure the DHCP override, you must have the IP address of the DHCP server.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	shutdown Example: Device(config)# shutdown	Shut down the WLAN.
Step 3	wlan profile-name Example: Device# wlan test4	Enters WLAN configuration submode. The <i>profile-name</i> is the profile name of the configured WLAN.
Step 4	ip dhcp opt82 {ascii format {add-ssid ap-ethmac} rid} Example: Device(config)# ip dhcp opt82 format add-ssid	Specifies the DHCP82 payload on the WLAN. The keyword and arguments are as follows: <ul style="list-style-type: none"> • ascii—Configures ASCII for DHCP Option 82. If this is not configured, the option 82 format is set to ASCII format. • format—Specifies the DHCP option 82 format. The following options are available: <ul style="list-style-type: none"> • <i>add-ssid</i>—Set RemoteID format that is the AP radio MAC address and SSID. • <i>ap-ethmac</i>—Set RemoteID format that is the AP Ethernet MAC address. <p>Note If the format option is not configured, only the AP radio MAC address is used.</p> <ul style="list-style-type: none"> • rid—Adds the Cisco 2 byte RID for DHCP option 82.

	Command or Action	Purpose
Step 5	ip dhcp required Example: Device(config-wlan) # ip dhcp required	Makes it mandatory for clients to get their IP address from the DHCP server. Static clients are not allowed.
Step 6	ip dhcp server ip-address Example: Device(config-wlan) # ip dhcp server 200.1.1.2	Defines a DHCP server on the WLAN that overrides the DHCP server address on the interface assigned to the WLAN.
Step 7	no shutdown Example: Device(config-wlan) # no shutdown	Restarts the WLAN.
Step 8	end Example: Device(config) # end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.
Step 9	show wlan wlan-name Example: Device(config-wlan) # show wlan test-wlan	Verifies the DHCP configuration.

Configuring DHCP Scopes (CLI)

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	ip dhcp pool pool-name Example: Device(config) # ip dhcp pool test-pool	Configures the DHCP pool address.
Step 3	network network-name mask-address Example: Device(dhcp-config) # network 209.165.200.224 255.255.255.0	Specifies the network number in dotted-decimal notation and the mask address.
Step 4	dns-server hostname Example: Device(dhcp-config) # dns-server example.com	Specifies the DNS name server. You can specify an IP address or a hostname.

	Command or Action	Purpose
Step 5	end Example: Device(config)# end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z to exit global configuration mode.

Configuring Internal DHCP Server

Configuring Internal DHCP Server Under Client VLAN SVI

Before you begin

- To use the internal DHCP server for both wireless and wired client VLAN, an IP address must be configured under the client VLAN switched virtual interfaces (SVI) interface.
- For wireless clients, the IP address of the internal DHCP server must be different from the address of the wireless client VLAN SVI interface (in DHCP helper address configuration).
- For wireless clients, the internal DHCP server can be configured under the client VLAN SVI interface or under the wireless policy profile.

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# <code>configure terminal</code>	Enters global configuration mode.
Step 2	interface loopback <i>interface-number</i> Example: Device(config)# <code>interface Loopback0</code>	Creates a loopback interface and enters interface configuration mode.
Step 3	ip address <i>ip-address</i> Example: Device(config-if)# <code>ip address 10.10.10.1 255.255.255.255</code>	Configures the IP address for the interface.
Step 4	exit Example: Device(config-if)# <code>exit</code>	Exits interface configuration mode.
Step 5	interface vlan <i>vlan-id</i> Example: Device(config)# <code>interface vlan 32</code>	Configures the VLAN ID.

	Command or Action	Purpose
Step 6	ip address <i>ip-address</i> Example: Device(config-if)# ip address 192.168.32.100 255.255.255.0	Configures the IP address for the interface.
Step 7	ip helper-address <i>ip-address</i> Example: Device(config-if)# ip helper-address 10.10.10.1	Configures the destination address for UDP broadcasts. Note If the IP address used in the ip helper-address command is an internal address of the controller, an internal DHCP server is used. Otherwise, the external DHCP server is used.
Step 8	no mop enabled Example: Device(config-if)# no mop enabled	Disables the Maintenance Operation Protocol (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.
Step 10	end Example: Device(config-if)# exit	Exits the interface configuration mode.
Step 11	ip dhcp excluded-address <i>ip-address</i> Example: Device(config)# ip dhcp excluded-address 192.168.32.1	Specifies the IP address that the DHCP server should not assign to DHCP clients.
Step 12	ip dhcp excluded-address <i>ip-address</i> Example: Device(config)# ip dhcp excluded-address 192.168.32.100	Specifies the IP addresses that the DHCP server should not assign to DHCP clients.
Step 13	ip dhcp pool <i>pool-name</i> Example: Device(config)# ip dhcp pool pool-vlan32	Configures the DHCP pool address.
Step 14	network <i>network-name mask-address</i> Example: Device(dhcp-config)# network 192.168.32.0 255.255.255.0	Specifies the network number in dotted-decimal notation, along with the mask address.

	Command or Action	Purpose
Step 15	default-router <i>ip-address</i> Example: Device (dhcp-config) # default-router 192.168.32.1	Specifies the IP address of the default router for a DHCP client.
Step 16	exit Example: Device (dhcp-config) # exit	Exits DHCP configuration mode.
Step 17	wireless profile policy <i>profile-policy</i> Example: Device (config) # wireless profile policy default-policy-profile	Configures the WLAN policy profile and enters the wireless policy configuration mode.
Step 18	central association Example: Device (config-wireless-policy) # central association	Configures central association for locally switched clients.
Step 19	central dhcp Example: Device (config-wireless-policy) # central dhcp	Configures the central DHCP for locally switched clients.
Step 20	central switching Example: Device (config-wireless-policy) # central switching	Configures WLAN for central switching.
Step 21	description <i>policy-profile-name</i> Example: Device (config-wireless-policy) # description "default policy profile"	Adds a description for the policy profile
Step 22	vlan <i>vlan-name</i> Example: Device (config-wireless-policy) # vlan 32	Assigns the profile policy to the VLAN.
Step 23	no shutdown Example: Device (config-wireless-policy) # no shutdown	Enables the profile policy.

Configuring the Internal DHCP Server Under a Wireless Policy Profile

Procedure

	Command or Action	Purpose
Step 1	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 2	interface loopback <i>interface-number</i> Example: Device(config)# interface Loopback0	Creates a loopback interface and enters interface configuration mode.
Step 3	ip address <i>ip-address</i> Example: Device(config-if)# ip address 10.10.10.1 255.255.255.255	Configures the IP address for the interface.
Step 4	exit Example: Device(config-if)# exit	Exits interface configuration mode.
Step 5	interface vlan <i>vlan-id</i> Example: Device(config)# interface vlan 32	Configures the VLAN ID.
Step 6	ip address <i>ip-address</i> Example: Device(config-if)# ip address 192.168.32.100 255.255.255.0	Configures the IP address for the interface.
Step 7	no mop enabled Example: Device(config-if)# no mop enabled	Disables the Maintenance Operation Protocol (MOP) for an interface.
Step 8	no mop sysid Example: Device(config-if)# no mop sysid	Disables the task of sending MOP periodic system ID messages.
Step 9	exit Example: Device(config-if)# exit	Exits interface configuration mode.
Step 10	ip dhcp excluded-address <i>ip-address</i> Example:	Specifies the IP addresses that the DHCP server should not assign to DHCP clients.

	Command or Action	Purpose
	Device(config)# ip dhcp excluded-address 192.168.32.1	
Step 11	ip dhcp excluded-address <i>ip-address</i> Example: Device(config)# ip dhcp excluded-address 192.168.32.100	Specifies the IP address that the DHCP server should not assign to DHCP clients.
Step 12	ip dhcp pool <i>pool-name</i> Example: Device(config)# ip dhcp pool pool-vlan32	Configures the DHCP pool address.
Step 13	network <i>network-name mask-address</i> Example: Device(dhcp-config)# network 192.168.32.0 255.255.255.0	Specifies the network number in dotted-decimal notation along with the mask address.
Step 14	default-router <i>ip-address</i> Example: Device(dhcp-config)# default-router 192.168.32.1	Specifies the IP address of the default router for a DHCP client.
Step 15	exit Example: Device(dhcp-config)# exit	Exits DHCP configuration mode.
Step 16	wireless profile policy <i>profile-policy</i> Example: Device(config)# wireless profile policy default-policy-profile	Configures a WLAN policy profile and enters wireless policy configuration mode.
Step 17	central association Example: Device(config-wireless-policy)# central association	Configures central association for locally switched clients.
Step 18	central switching Example: Device(config-wireless-policy)# central switching	Configures local switching.
Step 19	description <i>policy-profile-name</i> Example: Device(config-wireless-policy)# description "default policy profile"	Adds a description for the policy profile.

	Command or Action	Purpose
Step 20	ipv4 dhcp opt82 Example: Device(config-wireless-policy)# ipv4 dhcp opt82	Enables DHCP Option 82 for the wireless clients.
Step 21	ipv4 dhcp opt82 ascii Example: Device(config-wireless-policy)# ipv4 dhcp opt82 ascii	Enables ASCII on DHCP Option82.
Step 22	ipv4 dhcp opt82 format vlan_id Example: Device(config-wireless-policy)# ipv4 dhcp opt82 format vlan32	Enables VLAN ID.
Step 23	ipv4 dhcp opt82 rid vlan_id Example: Device(config-wireless-policy)# ipv4 dhcp opt82 rid	Supports the addition of Cisco 2-byte Remote ID (RID) for DHCP Option82.
Step 24	ipv4 dhcp server ip-address Example: Device(config-wireless-policy)# ipv4 dhcp server 10.10.10.1	Configures the WLAN's IPv4 DHCP server.
Step 25	vlan vlan-name Example: Device(config-wireless-policy)# vlan 32	Assigns the profile policy to the VLAN.
Step 26	no shutdown Example: Device(config-wireless-policy)# no shutdown	Enables the profile policy.

Configuring the Internal DHCP Server Globally

Procedure

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

	Command or Action	Purpose
Step 2	interface loopback <i>interface-num</i> Example: Device(config)# interface Loopback0	Creates a loopback interface and enters interface configuration mode.
Step 3	ip address <i>ip-address</i> Example: Device(config-if)# ip address 10.10.10.1 255.255.255.255	Configures the IP address for the interface.
Step 4	exit Example: Device(config-if)# exit	Exits interface configuration mode.
Step 5	interface vlan <i>vlan-id</i> Example: Device(config)# interface vlan 32	Configures the VLAN ID.
Step 6	ip address <i>ip-address</i> Example: Device(config-if)# ip address 192.168.32.100 255.255.255.0	Configures the IP address for the interface.
Step 7	no mop enabled Example: Device(config-if)# no mop enabled	Disables the Maintenance Operation Protocol (MOP) for an interface.
Step 8	no mop sysid Example: Device(config-if)# no mop sysid	Disables the task of sending MOP periodic system ID messages.
Step 9	exit Example: Device(config-if)# exit	Exits the interface configuration mode.
Step 10	ip dhcp-server <i>ip-address</i> Example: Device(config)# ip dhcp-server 10.10.10.1	Specifies the target DHCP server parameters.
Step 11	ip dhcp excluded-address <i>ip-address</i> Example: Device(config)# ip dhcp excluded-address 192.168.32.1	Specifies the IP address that the DHCP server should not assign to DHCP clients.

	Command or Action	Purpose
Step 12	ip dhcp excluded-address <i>ip-address</i> Example: Device(config)# ip dhcp excluded-address 192.168.32.100	Specifies the IP address that the DHCP server should not assign to DHCP clients.
Step 13	ip dhcp pool <i>pool-name</i> Example: Device(config)# ip dhcp pool pool-vlan32	Configures the DHCP pool address.
Step 14	network <i>network-name mask-address</i> Example: Device(dhcp-config)# network 192.168.32.0 255.255.255.0	Specifies the network number in dotted-decimal notation along with the mask address.
Step 15	default-router <i>ip-address</i> Example: Device(dhcp-config)# default-router 192.168.32.1	Specifies the IP address of the default router for a DHCP client.
Step 16	exit Example: Device(dhcp-config)# exit	Exits DHCP configuration mode.
Step 17	wireless profile policy <i>profile-policy</i> Example: Device(config)# wireless profile policy default-policy-profile	Configures a WLAN policy profile and enters wireless policy configuration mode.
Step 18	central association Example: Device(config-wireless-policy)# central association	Configures central association for locally switched clients.
Step 19	central dhcp Example: Device(config-wireless-policy)# central dhcp	Configures central DHCP for locally switched clients.
Step 20	central switching Example: Device(config-wireless-policy)# central switching	Configures local switching.
Step 21	description <i>policy-profile-name</i> Example: Device(config-wireless-policy)# description "default policy profile"	Adds a description for the policy profile.

	Command or Action	Purpose
Step 22	vlan <i>vlan-name</i> Example: Device(config-wireless-policy)# vlan 32	Assigns the profile policy to the VLAN.
Step 23	no shutdown Example: Device(config-wireless-policy)# no shutdown	Enables the profile policy.

Verifying Internal DHCP Configuration

To verify the client binding, use the following command:

```
Device# show ip dhcp binding
```

```

Bindings from all pools not associated with VRF:
IP address      Client-ID/      Lease expiration      Type      State
Interface
                Hardware address/
                User name
192.168.32.3    0130.b49e.491a.53    Mar 23 2018 06:42 PM    Automatic    Active
Loopback0

```

To verify the DHCP relay statistics for wireless client, use the following command:

```
Device# show wireless dhcp relay statistics
```

```

DHCP Relay Statistics
-----

DHCP Server IP : 10.10.10.1

Message          Count
-----
DHCPDISCOVER    : 1
BOOTP FORWARD   : 137
BOOTP REPLY     : 0
DHCPOFFER       : 0
DHCPREQUEST     : 54
DHCPACK         : 0
DHCPNAK         : 0
DHCPDECLINE     : 0
DHCPRELEASE     : 0
DHCPINFORM      : 82

Tx/Rx Time :
-----
LastTxTime : 18:42:18
LastRxTime : 00:00:00

Drop Counter :
-----
TxDropCount : 0

```

To verify the DHCP packet punt statistics in CPP, use the following command:

```
Device# show platform hardware chassis active qfp feature wireless punt statistics

CPP Wireless Punt stats:
```

App Tag	Packet Count
-----	-----
CAPWAP_PKT_TYPE_DOT11_PROBE_REQ	14442
CAPWAP_PKT_TYPE_DOT11_MGMT	50
CAPWAP_PKT_TYPE_DOT11_IAPP	9447
CAPWAP_PKT_TYPE_DOT11_RFID	0
CAPWAP_PKT_TYPE_DOT11_RRM	0
CAPWAP_PKT_TYPE_DOT11_DOT1X	0
CAPWAP_PKT_TYPE_CAPWAP_KEEPALIVE	2191
CAPWAP_PKT_TYPE_MOBILITY_KEEPALIVE	0
CAPWAP_PKT_TYPE_CAPWAP_CNTRL	7034
CAPWAP_PKT_TYPE_CAPWAP_DATA	0
CAPWAP_PKT_TYPE_MOBILITY_CNTRL	0
WLS_SMD_WEBAUTH	0
SISF_PKT_TYPE_ARP	5292
SISF_PKT_TYPE_DHCP	140
SISF_PKT_TYPE_DHCP6	1213
SISF_PKT_TYPE_IPV6_ND	350
SISF_PKT_TYPE_DATA_GLEAN	44
SISF_PKT_TYPE_DATA_GLEAN_V6	51
SISF_PKT_TYPE_DHCP_RELAY	122
CAPWAP_PKT_TYPE_CAPWAP_RESERVED	0

Additional References

Related Documents

Related Topic	Document Title
System Management	<i>System Management Configuration Guide (Catalyst 3850 Switches)</i>

Error Message Decoder

Description	Link
To help you research and resolve system error messages in this release, use the Error Message Decoder tool.	https://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi

MIBs

MIB	MIBs Link
All the supported MIBs for this release.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://cisco.com/go/mibs

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p>http://www.cisco.com/support</p>

Feature Information for DHCP for WLANs

Feature Name	Release	Feature Information
DHCP functionality for WLAN	Cisco IOS XE 3.2SE	This feature was introduced.