QUANTUM NETWORKS

Network Switch CLI Guide

DHCPv6 Commands

Contents

DHCPv6 Commands

clear ipv6 dhcp client

Syntax	**clear ipv6 dhcp client** *interface-id*
Parameters	*interface-id*—Interface identifier.
Default Configuration	N/A.
Command Mode	Privileged EXEC mode.
Usage	To restart DHCP for an IPv6 client on an interface, use the clear ipv6 dhcp client command in Privileged EXEC mode.
Example	The following example restarts the DHCP for IPv6 client on VLAN 100: switchxxxxxx# **clear ipv6 dhcp client vlan 100**
User Guideline	This command restarts DHCP for an IPv6 client on a specified interface after first releasing and unconfiguring previously-acquired prefixes and other configuration options (for example, Domain Name System [DNS] servers).

ipv6 address dhcp

Syntax	**ipv6 address dhcp** [rapid-commit] **no ipv6 address dhcp**
Parameters	**rapid-commit**—Allows the two-message exchange method for address assignment.
Default Configuration	No IPv6 addresses are acquired from the DHCPv6 server.
Command Mode	Interface (VLAN) Configuration mode. Interface (Ethernet, Port Channel, OOB) Configuration mode.
Usage	To enable DHCP for an IPv6 client process and acquire an IPv6 address on an interface, use the **ipv6 address dhcp** command in Interface Configuration mode. To remove the address from the interface, use the **no** form of this command.

Example	The following example enables IPv6 on VLAN 100 and acquires an IPv6 address: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 address dhcp** switchxxxxxx(config-if)# **exit**
User Guideline	This command enables IPv6 on an interface (if it is not enabled) and starts the DHCP for IPv6 client process, if this process is not yet running and if an IPv6 interface is enabled on the interface. This command allows an interface to dynamically learn its IPv6 address by using DHCPv6 and enables the DHCPv6 Stateless service. The **rapid-commit** keyword enables the use of the two-message exchange for address allocation and other configuration. If it is enabled, the client includes the rapid-commit option in a solicit message. This command allows an interface to dynamically learn its IPv6 address by using DHCPv6. The DHCPv6 stateless service allows to receive the configuration from a DHCPserver, passed in the following options: Option 12: OPTION_UNICAST - The IP address to which the client should send messages delivered using unicast. Option 23: OPTION_DNS_SERVERS - List of DNS Servers IPv6 Addresses Option 24: OPTION_DOMAIN_LIST - Domain Search List Option 31: OPTION_SNTP_SERVERS - List of SNTP Servers IPv6 Addresses Option 32: OPTION_INFORMATION_REFRESH_TIME - Information RefreshTime Option Option 41: OPTION_NEW_POSIX_TIMEZONE - New Timezone Posix String Option 59: OPT_BOOTFILE_URL - Configuration Server URL Option 60: OPT_BOOTFILE_PARAM, the first parameter - Configuration FilePath Name Option 7: OPTION_PREFERENCE - The preference value for the server in this message. The DHCPv6 client uses the following IAID format based on the interface-id on which it is running: Octet 1, bits 7-4: These bits are reserved and must be 0 Octet 1, Bits 3-0: These bits contain the interface type: 0—VLAN 1—Ethernet port 2—Port channel 3—Tunnel Octets 2-4: The octets contain a value depending on the interface type in the network format: VLAN Octet 2: Reserved, must be 0

	Octets 3-4: VLAN ID (1-4095) Ethernet port Octet 2, bits 7-4: Slot number Octet 2, bits 3-0: Port Type:0—Ethernet 1—Fast Ethernet 2—Giga Ethernet 3—2.5Giga Ethernet 4—5Giga Ethernet 5—10Giga Ethernet 6—12Giga Ethernet 7—13.6Giga Ethernet 8—16Giga Ethernet 9—20Giga Ethernet 10—40Giga Ethernet 11—100Giga Ethernet Octet 3: Unit numberOctet 4: Port number Port channel Octets 2-3: Reserved, must be 0 Octet 4: Port channel number Tunnel Octets 2-3: Reserved, must be 0 Octet 4: Tunnel number When IPv6 Forwarding is enabled only stateless information is required from a DHCPv6 server. When IPv6 forwarding is changed from disabled to enabled, IPv6 addresses assigned by a DHCPv6 are removed. When IPv6 forwarding is changed from enabled to disabled receiving IPv6 addresses from a DHCPv6 server is resumed. The DHCPv6 client, server, and relay functions are mutually exclusive on an interface.

ipv6 dhcp client information refresh

Syntax	**ipv6 dhcp client information refresh** *seconds*/**infinite** **no ipv6 dhcp client information refresh**
Parameters	*seconds*—The refresh time, in seconds. The value cannot be less than the minimal acceptable refresh time configured by the **ipv6 dhcp client information refresh** command. The maximum value that can be used is 4,294967,294 seconds (0xFFFFFFFE). **infinite**—Infinite refresh time.
Default Configuration	The default is 86,400 seconds (24 hours).
Command Mode	Interface Configuration mode.
Usage	To configure the refresh time for IPv6 client information refresh time on a specified interface if the DHCPv6 server reply does not include the Information Refresh Time, use the **ipv6 dhcp client information refresh** command in Interface Configuration mode. To return to the default value of the refresh time, use the **no** form of this command.
Example	The following example configures an upper limit of 2 days: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 dhcp client information refresh 172800** switchxxxxxx(config-if)# **exit**
User Guideline	This command restarts DHCP for an IPv6 client on a specified interface after first releasing and unconfiguring previously-acquired prefixes and other configuration options (for example, Domain Name System [DNS] servers).

ipv6 dhcp client information refresh minimum

Syntax	**ipv6 dhcp client information refresh minimum** *seconds*/**infinite** **no ipv6 dhcp client information refresh minimum**
Parameters	*seconds*—The refresh time, in seconds. The minimum value that can be used is 600 seconds. The maximum value that can be used is 4,294,967,294 seconds (0xFFFFFFFE). **infinite**—Infinite refresh time.
Default Configuration	The default is 86,400 seconds (24 hours).
Command Mode	Interface Configuration mode.
Usage	To configure the minimum acceptable refresh time on the specified interface, use the **ipv6 dhcp client information refresh minimum** command in Interface Configuration mode. To remove the configured refresh time, use the **no** form of this command.
Example	The following example configures an upper limit of 2 days: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 dhcp client information refresh 172800** switchxxxxxx(config-if)# **exit**
User Guideline	The ipv6 dhcp client information refresh minimum command specifies the minimum acceptable information refresh time. If the server sends an information refresh time option of less than the configured minimum refresh time, the configured minimum refresh time will be used instead. This command may be configured in the following situations: In unstable environments where unexpected changes are likely to occur. For planned changes, including renumbering. An administrator can gradually decrease the time as the planned event nears. Limit the amount of time before new services or servers are available to the client, such as the addition of a new Simple Network Time Protocol (SNTP) server or a change of address of a Domain Name System (DNS) server. If you configure the infinite keyword client, never refreshes the information.

ipv6 dhcp duid-en

Syntax	**ipv6 dhcp duid-en** enterprise-number identifier **no ipv6 dhcp duid-en**
Parameters	enterprise-number—The vendor's registered Private Enterprise number as maintained by IANA. identifier—The vendor-defined non-empty hex string (up to 64 hex characters). If the number of the character is not even '0' is added at the right. Each 2 hex characters can be separated by a period or colon.
Default Configuration	DUID Based on Link-layer Address (DUID-LL) is used. The base MAC Address is used as a Link-layer Address.
Command Mode	Global Configuration mode.
Usage	To set the Vendor Based on Enterprise Number DHVPv6 Unique Identified (DUID-EN) format, use the **ipv6 dhcp duid-en** command in Global Configuration mode. To return to the default value, use the **no** form of this command.
Example	**Example 1.** The following sets the DIID-EN format: ipv6 dhcp duid-en 90CC084D303000912 **Example 2.** The following sets the DIID-EN format using colons as delimiter: switchxxxxxx(config)# **ipv6 dhcp duid-en 9 0C:C0:84:D3:03:00:09:12**
User Guideline	By default, the DHCPv6 uses the DUID Based on Link-layer Address (seeRFC3315) with the Base MAC Address as a Link-layer Address. Use this command to change the DUID format to the Vendor Based on Enterprise Number.

ipv6 dhcp relay destination (Global)

Syntax	**ipv6 dhcp relay destination** {*ipv6-address* [*interface-id*]} | *interface-id* **no ipv6 dhcp relay destination** {*ipv6-address* [*interface-id*]} | *interface-id*
Parameters	*ipv6-address* [*interface-id*]—Relay destination IPv6 address in the form documented in RFC 4291 where the address is specified in hexadecimal using 16-bit values between colons. There are the following types of relay destination address: Link-local Unicast address: A user must specify the *interface-id* argument for this kind of address. Global Unicast IPv6 address- If the *interface-id* is omitted, then the Routing table is used. *interface-id*—Interface identifier that specifies the output interface for a destination. If this argument is configured, client messages are forwarded to the well-known link-local Multicast address **All_DHCP_Relay_Agents_and_Servers** (FF02::1:2) through the link to which the output interface is connected.
Default Configuration	There is no globally-defined relay destination.
Command Mode	Global Configuration mode.
Usage	To specify a globally-defined relay destination address to which client messages are forwarded, use the **ipv6 dhcp relay destination** command in Global Configuration mode. To remove a relay destination address, use the **no** form of this command.
Example	**Example 1.** The following example sets the relay unicast link-local destination address per VLAN 200: switchxxxxxx(config)# **ipv6 dhcp relay destination FE80::1:2 vlan 200** **Example 2.** The following example sets that client messages are forwarded to VLAN 200: switchxxxxxx(config)# **ipv6 dhcp relay destination vlan200** **Example 3.** The following example sets the unicast global relay destination address: switchxxxxxx(config)# **ipv6 dhcp relay destination 3002::1:2**

User Guideline	The **ipv6 dhcp relay destination** command specifies a destination address to which client messages are forwarded. The address is used by all DHCPv6 relays running on the switch. Up to 100 addresses can be defined. When a relay service is running on an interface, a DHCP for IPv6 message received on that interface will be forwarded to all configured relay destinations, configured per interface and globally. Multiple destinations can be configured on one interface, and multiple output interfaces can be configured for one destination. Unspecified, loopback, and Multicast addresses are not acceptable as the relay destination. Use the **no** form of the command with the *ipv6-address* and *interface-id* arguments to remove only the given globally-defined address with the given output interface. Use the **no** form of the command with the *ipv6-address* argument to remove only the given globally-defined address for all output interfaces. The **no** form of the command without the arguments removes all the globally-defined addresses.

ipv6 dhcp relay destination (Interface)

Syntax	**ipv6 dhcp relay destination** [{*ipv6-address* [*interface-id*]} | *interface-id*] **no ipv6 dhcp relay destination** [{*ipv6-address* [*interface-id*]} | *interface-id*]
Parameters	*ipv6-address* [*interface-id*]—Relay destination IPv6 address in the form documented in RFC 4291 where the address is specified in hexadecimal using 16-bit values between colons. There are the following types of relay destination address: Link-local Unicast address. A user must specify the *interface-id* argument for this kind of address. Global Unicast IPv6 address. If the *interface-id* argument is omitted then the Routing table is used. *interface-id*—Interface identifier that specifies the output interface for a destination. If this argument is configured, client messages are forwarded to the well-known link-local Multicast address **All_DHCP_Relay_Agents_and_Servers** (FF02::1:2) through the link to which the output interface is connected.
Default Configuration	The relay function is disabled, and there is no relay destination on an interface.
Command Mode	Interface Configuration mode.
Usage	To specify a destination address to which client messages are forwarded and to enable DHCP for IPv6 relay service on the interface, use the **ipv6 dhcp relay destination** command in Interface Configuration mode. To remove a relay destination on the interface or to delete an output interface for a destination, use the **no** form of this command.
Example	**Example 1.** The following example sets the relay Unicast link-local destination address per VLAN 200 and enables the DHCPv6 Relay on VLAN 100 if it was not enabled: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if**)# ipv6 dhcp relay destination FE80::1:2 vlan 200** switchxxxxxx(config-if)# **exit** **Example 2.** The following example sets the relay well known Multicast link-local destination address per VLAN 200 and enables the DHCPv6 Relay on VLAN 100 if it was not enabled:

	switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 dhcp relay destination vlan 200** switchxxxxxx(config-if)# **exit** **Example 3.** The following example sets the Unicast global relay destination address and enables the DHCPv6 Relay on VLAN 100 if it was not enabled: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 dhcp relay destination 3002::1:2** switchxxxxxx(config-if)# **exit** **Example 4.** The following example enables DHCPv6 relay on VLAN 100: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)# **ipv6 dhcp relaydestination** switchxxxxxx(config-if)# **exit** **Example 5.** The following example disables DHCPv6 relay on VLAN 100: switchxxxxxx(config)# **interface vlan 100** switchxxxxxx(config-if)#**noipv6dhcprelaydestination** switchxxxxxx(config-if)# **exit**
User Guideline	This command specifies a destination address to which client messages are forwarded, and it enables DHCP for IPv6 relay service on the interface. Up to 10 addresses can be defined per one interface and up to 100 addresses can be defined per switch. DHCPv6 Relay inserts the Interface-id option if an IPv6 global address is not defined on the interface on which the relay is running. The Interface-id field of the option is the interface name (a value of the **ifName** field of the **ifTable**) on which the relay is running. When relay service is running on an interface, a DHCP for IPv6 message received on that interface will be forwarded to all configured relay destinations configured per interface and globally. The incoming DHCP for IPv6 message may have come from a client on that interface, or it may have been relayed by another relay agent. The relay destination can be a Unicast address of a server or another relay agent,or it may be a Multicast address. There are two types of relay destination addresses: A link-local Unicast or Multicast IPv6 address, for which a user must specify an output interface. A global Unicast IPv6 address. A user can optionally specify an

	output interface for this kind of address. If no output interface is configured for a destination, the output interface is determined by routing tables. In this case, it is recommended that a Unicast or Multicast routing protocol be running on the router. Multiple destinations can be configured on one interface, and multiple output interfaces can be configured for one destination. When the relay agent relay messages to a Multicast address, it sets the hop limit field in the IPv6 packet header to 32. Unspecified, loopback, and node-local Multicast addresses are not acceptable as the relay destination. Note that it is not necessary to enable the relay function on an interface for it to accept and forward an incoming relay reply message from servers. By default, the relay function is disabled, and there is no relay destination on an interface. Use the **no** form of the command with arguments to remove a specific address. Use the **no** form of the command without arguments to remove all the defined addresses and to disable the relay on the interface.

show ipv6 dhcp

Syntax	**show ipv6 dhcp**
Parameters	N/A.
Default Configuration	-
Command Mode	User EXEC mode.
Usage	To display the Dynamic DHCP unique identifier (DUID) on a specified device, use the **show ipv6 dhcp** command in User EXEC mode. This information is relevant for DHCPv6 clients and DHCPv6 relays.
Example	**Example 1.** The following is sample output from this command when the switch's DUID format is vendor based on enterprise number: switchxxxxxx# **show** ipv6 dhcp The switch's DHCPv6 unique identifier(DUID)is 0002000000090CC084D303000912 Format: 2 Enterprise Number: 9 Identifier:0CC084D303000912

	Example 2. The following is sample output from this command when the switch's DUID format is the vendor-based on link-layer address: switchxxxxxx# **show** ipv6 dhcp The switch's DHCPv6 unique identifier(DUID)is 000300010024012607AA Format: 3 Hardware type: 1 MAC Address: 0024.0126.07AA **Example 3.** The following is sample output from this command when the switch's DUID format is vendor based on link-layer address and DHCPv6 Relay is supported: switchxxxxxx# **show** ipv6 dhcp The switch's DHCPv6 unique identifier(DUID)is 000300010024012607AA Format: 3 Hardware type: 1 MAC Address: 0024.0126.07AA Relay Destinations: 2001:001:250:A2FF:FEBF:A056 2001:1001:250:A2FF:FEBF:A056 2001:1011:250:A2FF:FEBF:A056 via VLAN 100 FE80::250:A2FF:FEBF:A056 via VLAN 100 FE80::250:A2FF:FEBF:A056 via VLAN 200
User Guideline	-

show ipv6 dhcp interface

Syntax	**show ipv6 dhcp interface** [*interface-id*]
Parameters	*interface-id*–Interface identifier.
Default Configuration	-
Command Mode	USer EXEC mode.
Usage	To display DHCP for IPv6 interface information, use the show ipv6 dhcp interface command in User EXEC mode.
Example	The following is sample output from this command when DHCPv6 client is enabled: switchxxxxxx#**show ipv6 dhcp interface** VLAN 100 is in client mode Configuration: StatefullServiceisenabled(rapid-commit)

	Auto-Configuration is enabled Information Refresh Time: 86400 seconds InformationRefreshMinimumTime:600seconds State:DHCPOperationalmodeisenabled StatefullServiceisavailable DHCP server: Address: FE80::204:FCFF:FEA1:7439DUID: 000300010002FCA17400 Preference: 20 IPv6 Address Information: IA NA: IA ID 0x00040001, T1 120, T2 192 IPv6 Address: 30e0::12:45:11 preferred lifetime: 300, valid lifetime:54333 expires at Nov 08 2002 09:11 (54331 seconds)renew for address will be sent in 54301 seconds IPv6 Address: 3012::13:af:25 preferredlifetime:280,validlifetime:51111 expiresatNov08200208:17(51109seconds) renew for address will be sent in 5101seconds Stateless Information: Information Refresh Time: 86400 seconds expiresat Nov08200208:17(51109seconds) DNS Servers: 1001::1, 2001::10 DNSDomainSearchList:company.combeta.orgSNTP Servers: 2004::1 POSIX Timezone string:EST5EDT4,M3.2.0/02:00,M11.1.0/02:00 Configuration Server: config.company.com Configuration Path Name: qqq/config/aaa_config.dat Indirect Image Path Name: VLAN 105 is in clientmode Configuration: Statefull Service is enabledAuto- Configuration is disabled Information Refresh Time: 86400 seconds InformationRefresh MinimumTime:600seconds State: DHCP Operational mode is enabled StatefullServiceisnotavailable(IPv6routingisenabled)DHCP server: Address: FE80::204:FCFF:FEA1:7439DUID: 000300010002FCA17400 Preference: 20 Stateless Information: Information Refresh Time: 86400 seconds expiresat Nov08200208:17(51109seconds) DNS Servers: 1001::1, 2001::10 DNSDomainSearchList:company.combeta.orgSNTP Servers: 2004::1 POSIX Timezone string:EST5EDT4,M3.2.0/02:00,M11.1.0/02:00 Configuration Server: config.company.com Configuration Path Name: qqq/config/aaa_config.dat Indirect Image Path Name: qqq/config/aaa_image_name.txt VLAN 107 is in clientmode Configuration: Statefull Service is enabledAuto-Configuration is enabled Information Refresh Time: 86400 seconds InformationRefresh MinimumTime:600seconds State: DHCP Operational mode is enabled Statefull Service is not available(IPv6routingisenabled)DHCP server:

	Address: FE80::204:FCFF:FEA1:7439DUID: 000300010002FCA17400 Preference: 20 Stateless Information: Information Refresh Time: 86400 seconds expires at Nov08200208:17 (51109seconds) DNS Servers: 1001::1, 2001::10 DNSDomainSearchList:company.combeta.orgSNTP Servers: 2004::1 POSIX Timezone string:EST5EDT4,M3.2.0/02:00,M11.1.0/02:00 Configuration Server: config.company.com Configuration Path Name: qqq/config/aaa_config.dat Indirect Image Path Name: qqq/config/aaa_image_name.txt VLAN 110 is in clientmode Configuration: Statefull Service is enabled Auto-Configuration is disabled Information Refresh Time: 86400 seconds Information Refresh MinimumTime:600seconds State: DHCPOperationalmodeisdisabled(IPv6isnotenabled)VLAN 1000 is in clientmode Configuration: Statefull Service is enabled Auto-Configuration is enabled Information Refresh Time: 86400 seconds Information Refresh MinimumTime:600seconds State: DHCPOperationalmodeisdisabled(InterfacestatusisDOWN)DHCP server: Address: FE80::204:FCFF:FEA1:7439DUID: 000300010002FCA17400 Preference: 20 Stateless Information: Information Refresh Time: 86400 seconds expires at Nov08200208:17 (51109seconds) DNS Servers: 1001::1, 2001::10 DNSDomainSearchList:company.combeta.orgSNTP Servers: 2004::1 POSIX Timezone string:EST5EDT4,M3.2.0/02:00,M11.1.0/02:00 Configuration Server: config.company.com Configuration Path Name: qqq/config/aaa_config.dat Indirect Image Path Name: qqq/config/aaa_image_name.txt VLAN 1010 is in relaymode DHCPOperationalmodeisenabled Relaysourceinterface:VLAN101 Relaydestinations:2001:001:250:A2FF:FEBF:A056 FE80::250:A2FF:FEBF:A056 via FastEthernet 1/0/10
User Guideline	If no interfaces are specified in the command, all interfaces on which DHCP forIPv6 (client or server) is enabled are displayed. If an interface is specified in thecommand, only information about the specified interface is displayed. *Note: This new output format is supported starting with the SW version supporting state full configuration*