

How To | Use DHCPv6 to Assign Specific IPv6 Addresses to Specific Devices

Introduction

When using IPv4, most devices default to using their MAC address as their DHCP client ID. Additionally, it is common for devices to allow the configuration of a specific DHCP client ID string. Either way, the client ID provides a clear link between allocated IP address and a client device, making it easy for network administrators to associate IP addresses and specific users or devices.

By default, DHCPv6 uses a DHCP Unique Identifier-Link Local Time-stamp (DUID-LLT) client identifier instead of a MAC address. This is generated by the operating system when DHCP first starts. If the OS is reinstalled the DUID-LLT can change, and multiple operating systems on the machine will all have different DUIDs. This makes the relationship between allocated addresses and client devices less intuitive for the network administrator.

One solution to this issue is offered by the “subscriber-id-auto-mac” feature. This feature configures a relay agent to insert the client’s MAC address into a subscriber-ID option in the relay envelope of the DHCP packets, as they pass through the relay on the way from the client to the server. A suitably configured server can then use this subscriber-ID option to assign an IPv6 address based on the client MAC address.

List of terms

DHCPv6

The Dynamic Host Configuration Protocol for IPv6 (DHCPv6) enables DHCP servers to pass configuration parameters such as IPv6 network addresses to IPv6 nodes. It offers the capability of automatic allocation of reusable network addresses and additional configuration flexibility.

DUID-LLT

DHCP Unique Identifier-Link Local Time-stamp (DUID-LLT). The Link-Layer address of one of the device’s network interfaces, concatenated with a time-stamp.

Subscriber-ID

DHCPv6 option 38 is also called the Relay Agent Subscriber-ID option. This contains information about the subscriber that originated the DHCP request.

What information will you find in this document?

This How To Note begins by describing which products and software version the information applies to, then describes how to configure the subscriber-id-auto-mac feature.

Which products and software version does it apply to?

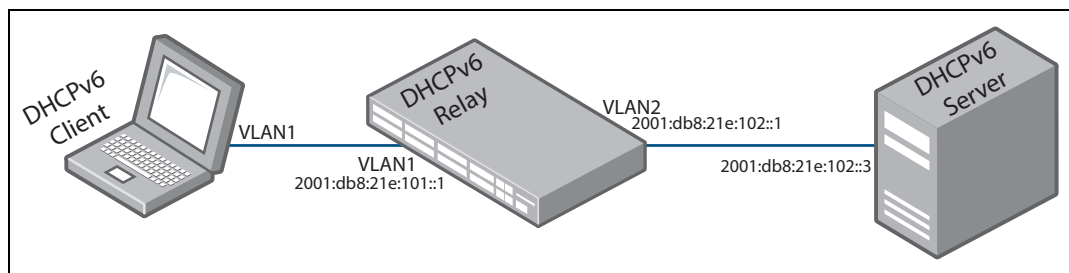
This feature is available on all platforms that support DHCPv6 relay running AlliedWare Plus™ version **5.4.5** or later.

Configuration Example

This example shows how to configure the subscriber-id-auto-mac feature. It uses an AlliedWare Plus switch as the DHCPv6 relay, and an ISC DHCP server as the DHCPv6 server. The server needs to be running ISC DHCP version 4.3.0 or later, or an equivalent. ISC DHCP server is available from www.isc.org/downloads/dhcp.

You do not need to change the configuration of the DHCP client, only the relay and the server.

The following figure shows the network configuration for this example.



1. Configure the relay.

In this step we create the two VLANs and assign IPv6 addresses to them. DHCPv6 relay is enabled on the client-facing VLAN (VLAN1), and the subscriber-id-auto-mac feature option is configured on the relay. The relay is configured with the IPv6 address of the DHCP server and informed that the server is accessed via VLAN2.

```
vlan database
  vlan 2 state enable
!
interface vlan1
  ipv6 address 2001:db8:21e:101::1/64
  ip dhcp-relay agent-option subscriber-id-auto-mac
  ip dhcp-relay server-address 2001:db8:21e:102::3 vlan2
!
interface vlan2
  ipv6 address 2001:db8:21e:102::1/64
```

2. Configure the server.

The following figure shows the configuration of the DHCP server. In this example, we assign the IPv6 address 2001:db8:21e:101::43 to the subscriber that has a MAC address of 00:00:5e:00:53:12.

In this example we used version 4.3.0 of the ISC DHCP server. The server's IPv6 address is 2001:db8:21e:102::3.

```
default-lease-time 600;
max-lease-time 7200;
log-facility local7;

subnet6 2001:db8:21e:102::0/64 {
}

subnet6 2001:db8:21e:101::0/64 {
  #General pool for clients
  range6 2001:db8:21e:101::10 2001:db8:21e:101::30

  #Fixed host address for client 00:00:5e:00:53:12
  host specialclient {
    host-identifier v6relopt 33 dhcp6.subscriber-id 00:00:5e:00:53:12;
    fixed-address6 2001:db8:21e:101::43
  }
}
```

When a DHCPv6 request arrives at the relay from the PC (e.g. with MAC address 00:00:5e:00:53:12), the relay inserts that MAC into the subscriber-ID option field of the packet.

The server recognizes this MAC address in the field, and matches it to the static host entry with which it has been configured.

Matching the MAC address to the static entry, the server allocates the IPv6 address 2001:db8:21e:101::43 to the client.