

DHCP External Server Identification of Clients with Duplicate MAC Addresses Overview

You can configure the DHCP external server application to use a combination of the media access control (MAC) address and the gateway IP address (giaddr) to uniquely identify DHCP clients attached to the router. Using this feature enables you to manage DHCP clients in network environments in which MAC addresses are not unique.

In some network environments where the DHCP external server application manages DHCP clients from multiple DHCP relays, the same MAC address might be assigned to more than one DHCP client. This can occur, for example, when network adapters are manufactured with the same hardware address, resulting in duplicate MAC addresses among the DHCP clients attached to the router.

To better manage DHCP clients in network environments with multiple DHCP relays in which MAC addresses are not unique, you can configure the DHCP external server application to use a combination of the MAC address and the giaddr to uniquely identify the clients connected to the router. This setting for DHCP external server is also referred to as *duplicate MAC mode*.

By default, DHCP external server uses only the MAC address to uniquely identify DHCP clients. The default setting for DHCP external server is also referred to as *unique MAC mode*.

To enable duplicate MAC mode for the DHCP external server application, you must issue the **dhcp-external duplicate-mac-address** command from Global Configuration mode. To restore the default behavior and re-enable unique MAC mode, issue the **no dhcp-external duplicate-mac-address** command.

Configuration Guidelines for Using Duplicate MAC Mode

Observe the following guidelines when you configure the DHCP external server application to use a combination of the MAC address and giaddr to uniquely identify DHCP clients, otherwise known as enabling duplicate MAC mode:

- Unlike other commands for configuring DHCP external server, the **dhcp-external duplicate-mac-address** command applies globally to all instances of the DHCP external server application on the router, and is not issued on a per-VR basis.
- Although the same MAC address can be assigned to more than one DHCP client in the network, MAC addresses must be unique for each giaddr assigned by a DHCP relay in the network when duplicate MAC mode is enabled.
- As is the case with unique MAC mode, client IP addresses managed by the DHCP external server application must be unique across all VRs configured on the router.
- You can configure DHCP external server to support both duplicate MAC mode (by issuing the **dhcp-external duplicate-mac-address** command) and creation of subscriber state information based on lease renewals (by issuing the **ip dhcp-external server-sync** command) simultaneously.

- DHCP external server supports the following VR topology changes for DHCP clients regardless of whether duplicate MAC mode is enabled or disabled:
 - A client roams across VRs; this might occur, for example, when a laptop computer moves to a different building in a campus network.
 - A client is assigned to a different VR; this might occur, for example, when a quality of service (QoS) policy assigns a client to a different VR during the DHCP binding process.
- When DHCP external server is configured to support unique MAC mode, which is the default, it uses only the MAC address to uniquely identify DHCP clients. Consequently, when unique MAC mode is enabled, the MAC addresses for all DHCP clients must be unique across all VRs configured on the router.

Restrictions for Using Duplicate MAC Mode to Manage Clients

The following restrictions apply when you configure the DHCP external server application to use a combination of the MAC address and giaddr to uniquely identify DHCP clients, otherwise known as duplicate MAC mode:

- You can issue the **dhcp-external duplicate-mac-address** command at any time to enable duplicate MAC mode. However, you *cannot* issue the **no dhcp-external duplicate-mac-address** command to restore the default setting, unique MAC mode, if DHCP external server is configured for duplicate MAC mode and is currently managing any DHCP clients.
- Do not enable duplicate MAC mode for the DHCP external server application when it is configured in the same VR with either of the following:
 - An instance of the DHCP relay application that is currently managing host routes
 - Any instance of the DHCP relay proxy application
- When you enable duplicate MAC mode, the DHCP external server application ignores notifications of new clients from the RADIUS relay server application because these notifications do not include the giaddr.

Related Topics

- Configuring DHCP External Server to Uniquely Identify Clients with Duplicate MAC Addresses
- `dhcp-external duplicate-mac-address`