



## CHAPTER 2

# MAC Address Table

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### Note

For information about creating interfaces, see the document, *Cisco Nexus 1000V Interface Configuration Guide, Release 4.0(4)SV1(1)*.

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## Information About MAC Address Tables

Layer 2 ports correlate the MAC address on a packet with the Layer 2 port information for that packet using the MAC address table. A MAC address table is built using the MAC source addresses of the frames received. When a frame is received for a MAC destination address not listed in the address table, the frame is flooded to all LAN ports of the same VLAN with the exception of the port that received the frame. When the destination station replies, the relevant MAC source addresses and port IDs are added to the address table. Then subsequent frames are forwarded to a single LAN port without flooding all LAN ports.

You can configure MAC addresses, which are called static MAC addresses, to statically point to specified interfaces on the device. These static MAC addresses override any dynamically learned MAC addresses on those interfaces. You cannot configure broadcast or multicast addresses as static MAC addresses. The static MAC entries are retained across reboots.

The address table can store up to 100 address entries. An aging timer triggers removal of addresses from the table when they remain inactive for 300 seconds. The aging timer can be configured on a global basis but not per VLAN. The aging timer is configurable on a global basis but not on a per VLAN basis.

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You can configure the length of time an entry remains in the MAC address table, clearing the table, and so forth.

## Guidelines and Limitations

Keep in mind the following guidelines for configuring MAC addresses:

- The forwarding table for each VLAN in a VEM can store up to 1024 MAC addresses.
- Static MAC address entries cannot be configured on an interfaces where port security is enabled. Instead, use the following command in Interface Configuration mode:

```
n1000v(config-if)# switchport port-security mac address xxxx.yyyy.zzzz [vlan vlan id].
```

For more information, see the *Cisco Nexus 1000V Security Configuration Guide, Release 4.0(4)SVI(1)*.

- The NX-OS software explicitly prohibits configuring port security on ports that have a static MAC addresses configured on the following VLANs:
  - the access VLAN of an access port
  - the native VLAN of a trunk port

## Configuring a Static MAC Address

Use this procedure to configure a MAC address to statically point to a specific interface.

### BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.
- You cannot configure broadcast or multicast addresses as static MAC addresses.
- Static MAC addresses override dynamically-learned MAC addresses on an interface.



#### Note

Be aware that the NX-OS commands may differ from those used in Cisco IOS.

### SUMMARY STEPS

1. **config t**
2. **mac address-table static** *mac address* **vlan** *vlan-id* {[**drop** | **interface** {*type number* | | **port-channel** *number*}]}
3. **exit**
4. **show mac address-table static**
5. **copy running-config startup-config**

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## DETAILED STEPS

	Command	Purpose
Step 1	<code>config t</code>  <b>Example:</b> n1000v# config t n1000v(config)#	Places you into CLI Global Configuration mode.
Step 2	<code>mac address-table static mac_address vlan vlan-id {[drop   interface {type number}   port-channel number]}</code>  <b>Example:</b> n1000v(config)# mac address-table static 12ab.47dd.ff89 vlan 3 interface ethernet 2/1	Adds a static MAC address in the Layer 2 MAC address table and saves it in the running configuration.  Interface can be specified as either of the following: <ul style="list-style-type: none"> <li>• ethernet <i>slot/port</i></li> <li>• veth <i>number</i></li> </ul>
Step 3	<code>exit</code>  <b>Example:</b> n1000v(config)# exit n1000v#	Exits Global Configuration mode and returns you to EXEC mode.
Step 4	<code>show mac address static</code>  <b>Example:</b> n1000v# show mac address static	(Optional) Displays the static MAC addresses.
Step 5	<code>copy running-config startup-config</code>  <b>Example:</b> n1000v# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

```

Example:
n1000v# config t
n1000v(config)# mac address static 12ab.47dd.ff89 vlan 3 interface ethernet 2/1
n1000v# show mac address static
Legend:
      * - primary entry, G - Gateway MAC, (R) - Routed MAC
      age - seconds since last seen
      VLAN   MAC Address      Type      age      Secure  NTFY   Ports
-----+-----+-----+-----+-----+-----+-----
G      -      12ab.47dd.ff89    static    -        False  False  eth2/1
n1000v#

```

## Configuring the Aging Time for the MAC Table

Use this procedure to configure the amount of time that a packet source MAC address and port on which it was learned remain in the MAC table containing the Layer 2 information.



### Note

You can also configure MAC aging time in interface configuration mode or VLAN configuration mode.

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## BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.



### Note

Be aware that the Cisco NX-OS commands may differ from those used in Cisco IOS.

## SUMMARY STEPS

- config t**
- mac address-table aging-time *seconds***
- exit**
- show mac address-table**
- copy running-config startup-config**

## DETAILED STEPS

	Command	Purpose
Step 1	<b>config t</b>  <b>Example:</b> n1000v# config t n1000v(config)#	Places you into CLI Global Configuration mode.
Step 2	<b>mac address-table aging-time <i>seconds</i></b>  <b>Example:</b> n1000v(config)# mac address-table aging-time 600	Specifies and saves in the running configuration the amount of time that will elapse before an entry in the Layer 2 MAC address table is discarded.  Allowable entries: <ul style="list-style-type: none"> <li>120 to 918000 seconds (default is 300)</li> <li>If you specify zero (0), MAC aging is disabled.</li> </ul>
Step 3	<b>exit</b>  <b>Example:</b> n1000v(config)# exit n1000v#	Exits Global Configuration mode and returns you to EXEC mode.
Step 4	<b>show mac address-table aging-time</b>  <b>Example:</b> n1000v# show mac address-table aging-time	(Optional) Displays the aging time in the MAC address table.
Step 5	<b>copy running-config startup-config</b>  <b>Example:</b> n1000v# copy running-config startup-config	(Optional) Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

### Example:

```
n1000v# config t
n1000v(config)# mac address-table aging-time 600
n1000v(config)#
```

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# Clearing Dynamic Addresses from the MAC Address Table

Use this procedure to clear all dynamic Layer 2 entries from the MAC address table.

## BEFORE YOU BEGIN

Before beginning this procedure, you must know or do the following:

- You are logged in to the CLI in EXEC mode.



### Note

Be aware that the NX-OS commands may differ from those used in Cisco IOS.

## SUMMARY STEPS

- `clear mac address-table dynamic {address mac_addr} {interface [type number] | port-channel number | vlan vlan_id}`
- `show mac address-table`

## DETAILED STEPS

	Command	Purpose
Step 1	<pre>clear mac address-table dynamic {address <i>mac_addr</i>} {interface [<i>type number</i>]   port-channel <i>number</i>   vlan <i>vlan_id</i>}</pre> <p><b>Example:</b> n1000v# clear mac address-table dynamic n1000v#</p> <p><b>Example:</b> n1000v# clear mac address-table dynamic vlan 5 n1000v#</p>	<p>Clears the dynamic address entries from the Layer 2 MAC address table.</p> <p>Interface can be specified as either of the following:</p> <ul style="list-style-type: none"> <li>ethernet <i>slot/port</i></li> <li>veth <i>number</i></li> </ul> <p>This example clears the entire MAC address table of all dynamic entries.</p> <p>This example clears only those dynamic MAC addresses learned on VLAN 5 from the MAC address table.</p>
Step 2	<pre>show mac address-table</pre> <p><b>Example:</b> n1000v# show mac address-table</p>	<p>(Optional) Displays the MAC address table.</p>

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## Verifying the Layer 2 Switching Configuration

Use the following commands to display and verify the Layer 2 MAC address configuration.

Command	Purpose
<code>show mac address-table</code>	Displays the MAC address table.
<code>show mac address-table static</code>	Displays information about the MAC address table static entries.
<code>show mac address-table aging-time</code>	Displays the aging time in the MAC address table.
<code>show interface [&lt;interface&gt;] mac</code>	Displays the MAC addresses and the burn-in MAC address for an interface.



**Note** The Cisco Nexus 1000V MAC address table does not display multicast MAC addresses.

## Layer 2 Switching Example Configuration

The following example shows how to add a static MAC address:

```
n1000v# configure terminal
n1000v(config)# mac address-table static 0000.0000.1234 vlan 10 interface ethernet 2/15
n1000v(config)# mac address-table aging-time 120
```

## Default Setting

Table 2-1 lists the default setting for the MAC address aging time.

**Table 2-1** Default MAC Address Aging Time

Parameters	Default
Aging time	300 seconds

## Additional References

For additional information related to implementing Layer 2 switching, see the following sections:

- [Related Documents, page 2-7](#)
- [Standards, page 2-7](#)

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## Related Documents

Related Topic	Document Title
Interfaces	<i>Cisco Nexus 1000V Interface Configuration Guide, Release 4.0(4)SV1(1)</i>
Port-Profiles	<i>Cisco Nexus 1000V Port Profile Configuration Guide, Release 4.0(4)SV1(1)</i>
System management	<i>Cisco Nexus 1000V System Management Configuration Guide, Release 4.0(4)SV1(1)</i>
Release Notes	<i>Cisco Nexus 1000V Release Notes, Release 4.0(4)SV1(1)</i>
Layer 2 commands	<i>Cisco Nexus 1000V Command Reference, Release 4.0(4)SV1(1)</i>

## Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

## Feature History for the MAC Address Table

This section provides the MAC address tables release history.

Feature Name	Releases	Feature Information
MAC Address Tables	4.0(4)SV1(1)	This feature was introduced.

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