Configuring MAC Address Tables

This chapter contains the following sections:

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. 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 if you copy the static MAC addresses configuration to the startup configuration by using the copy running-config startup-config command.

The address table per VEM can store up to 32,000 MAC entries. An aging timer triggers removal of addresses from the table when they remain inactive for the default time of 300 seconds. The aging timer can be configured on a global basis but not per VLAN.

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

Guidelines and Limitations

- The forwarding table for each VLAN in a VEM can store up to 4096 MAC addresses.
- You can configure only 32 static MAC addresses on a single interface and 1024 static MAC addresses on a DVS.
- The Cisco Nexus 1000V supports a maximum of 2000 private VLAN MAC addresses on a VSM.

Default Settings

Table 1: Default MAC Address Aging Time

Parameters	Default
Aging time	1800 seconds

Configuring the MAC Address Table

Configuring a Static MAC Address

You can configure a MAC address to statically point to a specific interface.

Before You Begin

- Log in to the CLI in EXEC mode.
- Know that you cannot configure broadcast or multicast addresses as static MAC addresses.
- Know that static MAC addresses override dynamically learned MAC addresses on an interface.

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **mac address-table static** *mac_address* **vlan** *vlan-id* {[**drop** | **interface** {**type***if_id*} | **port-channel number**]}	Adds a static MAC address in the Layer 2 MAC address table and saves it in the running configuration.

	Command or Action	Purpose
		The interface can be specified as either of the following: • ethernet *slot/port* • veth *number*
Step 3	switch(config)# **show mac address static interface** [**type** *if_id*]	(Optional) Displays static MAC addresses.
Step 4	switch(config)# **copy running-config startup-config**	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to configure a static MAC address:

```
switch# configure terminal
switch(config)# mac address-table static
switch(config)# show mac address static interface12ab.47dd.ff89 vlan 3
interface ethernet 3/3

VLAN      MAC Address       Type    Age       Port                           Mod
---------+-----------------+-------+---------+------------------------------+---------
1         0002.3d11.5502    static  0         N1KV Internal Port             3
1         0002.3d21.5500    static  0         N1KV Internal Port             3
1         0002.3d21.5502    static  0         N1KV Internal Port             3
1         0002.3d31.5502    static  0         N1KV Internal Port             3
1         0002.3d41.5502    static  0         N1KV Internal Port             3
1         0002.3d61.5500    static  0         N1KV Internal Port             3
1         0002.3d61.5502    static  0         N1KV Internal Port             3
1         0002.3d81.5502    static  0         N1KV Internal Port             3
3         12ab.47dd.ff89    static  0         Eth3/3                         3
342       0002.3d41.5502    static  0         N1KV Internal Port             3
343       0002.3d21.5502    static  0         N1KV Internal Port             3
Total MAC Addresses: 11
n1000v(config)# show mac address static interface Ethernet 3/3
VLAN      MAC Address       Type    Age       Port                           Module
---------+-----------------+-------+---------+------------------------------+---------
3         12ab.47dd.ff89    static  0         Eth3/3                         3
Total MAC Addresses: 1
switch(config)#
```

Configuring the Aging Time

You can configure the amount of time that packet source MAC addresses, and the ports on which they are learned, remain in the MAC table.

Note The aging time is a global setting that cannot be configured per VLAN. Although it is a global setting, you can also configure the MAC aging time in interface configuration mode or VLAN configuration mode.

Before You Begin

Log in to the CLI in EXEC mode.

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

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch# **mac address-table aging-time** *seconds*	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 are as follows: • 120 to 918000 seconds (default is 300) • If you specify zero (0), MAC aging is disabled.

This example shows how to configure the aging time:

```
switch# configure terminal
switch(config)# mac address-table aging-time 600
switch(config)# show mac address-table aging-time
Vlan  Aging Time
----- ----------
101   300
100   300
1     300
switch#
```

Clearing Dynamic Addresses from the MAC Address Table

Before You Begin

Log in to the CLI in EXEC mode.

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

Procedure

	Command or Action	Purpose
Step 1	switch# **clear mac address-table dynamic** [**vlan** *vlan_id*]	Clears the dynamic address entries from the Layer 2 MAC address table.

	Command or Action	Purpose
Step 2	switch# **show mac address-table**	(Optional) Displays the MAC address table.

This example shows how to clear the entire MAC address table of all dynamic entries:

```
switch# clear mac address-table dynamic
switch#
```

This example shows how to clear the MAC address table of only those dynamic MAC addresses learned on VLAN 5:

```
switch# clear mac address-table dynamic vlan 5
switch#
```

Verifying the MAC Address Table Configuration

Use the following commands to verify the configuration:

Command	Purpose
show mac address-table	Displays the MAC address table.
show mac address-table module	Displays information about specific module a specific module.
show mac address-table static	Displays information about the MAC address table static entries.
show mac address-table static |inc veth	Displays the static MAC address of vEthernet interfaces in case a VEM physical port learns a dynamic MAC and the packet source is in another VEM on the same VSM.
show mac address static interface [**type** *if_id*]	Displays all static MAC addresses.
show mac address-table aging-time	Displays the aging time in the MAC address table.
show mac address-table count	Displays a count of MAC address entries.
show interface *interface_id* **mac**	Displays the MAC addresses and the burned-in MAC address for an interface.

Configuration Example for MAC Address Tables

This example shows how to add a static MAC address and establish a global aging time:

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

Feature History for MAC Address Tables

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