



Configuring MAC Address Tables

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Information About MAC Addresses

To switch frames between LAN ports, the switch maintains an address table. When the switch receives a frame, it associates the media access control (MAC) address of the sending network device with the LAN port on which it was received.

The switch dynamically builds the address table by using the MAC source address of the frames received. When the switch receives a frame for a MAC destination address not listed in its address table, it floods the frame to all LAN ports of the same VLAN except the port that received the frame. When the destination station replies, the switch adds its relevant MAC source address and port ID to the address table. The switch then forwards subsequent frames to a single LAN port without flooding all LAN ports.

You can also enter a MAC address, which is termed a static MAC address, into the table. These static MAC entries are retained across a reboot of the switch.

RMAC Learning

Starting with Cisco NX-OS Release 7.2(0)N1(1), the RMAC Learning feature is supported on Cisco Nexus 5600 and 6000 series switches. This feature allows the default MAC address (RMAC) of a VLAN interface to be dynamically learned on another VLAN over a bridged interface on the switch. For example, consider two VLANs—VLAN X and VLAN Y—bridged over an external device. If a customer has a VLAN interface configured on VLAN Y, the MAC address of the interface will be dynamically learned on VLAN X.

Configuring MAC Addresses

Configuring Static MAC Addresses

You can configure static MAC addresses for the switch. These addresses can be configured in interface configuration mode or in VLAN configuration mode.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config) # mac-address-table static <i>mac_address</i> vlan <i>vlan-id</i> { drop interface { <i>type slot/port</i> } port-channel <i>number</i> } [auto-learn]	Specifies a static address to add to the MAC address table. If you enable the auto-learn option, the switch will update the entry if the same MAC address is seen on a different port.
Step 3	switch(config)# no mac address-table static <i>mac_address</i> vlan <i>vlan-id</i>	(Optional) Deletes the static entry from the MAC address table. Use the mac address-table static command to assign a static MAC address to a virtual interface.

This example shows how to put a static entry in the MAC address table:

```
switch# configure terminal
switch(config) # mac address-table static 12ab.47dd.ff89 vlan 3 interface ethernet 1/4
switch(config) #
```

Configuring the Aging Time for the MAC Table

You can configure the amount of time that an entry (the packet source MAC address and port that packet ingresses) remains in the MAC table. MAC aging time can be configured in either interface configuration mode or in VLAN configuration mode.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# mac-address-table aging-time <i>seconds</i> [vlan <i>vlan_id</i>]	Specifies the time before an entry ages out and is discarded from the MAC address table. The <i>seconds</i> range is from 0 to 1000000. The default is 300 seconds for Cisco NX-OS 5500 and 1800 for Cisco NX-OS 5600 and 6000 series. Entering the value 0 disables the MAC

	Command or Action	Purpose
		aging. If a VLAN is not specified, the aging specification applies to all VLANs.

This example shows how to set the aging time for entries in the MAC address table to 300 seconds:

```
switch# configure terminal
switch(config) # mac address-table aging-time 300
switch(config) #
```

Configuring MAC Move Loop Detection

When the number of MAC address moves between two ports exceeds a threshold, it forms a loop. From Cisco NX-OS release 6.0(2)N2(1), you can configure the action of bringing down the port with the lower interface index when such a loop is detected by using the **mac address-table loop-detect port-down** command. To revert to the default action of disabling MAC learning, use the **no** form of this command.



Note

If only the loop-detect port-down configuration is enabled, the last port on which MAC loop is detected is err-disabled.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# [no] mac address-table loop-detect port-down	Specifies the port-down action for MAC move loop detection. The no form of this command reverts to the default action of disabling MAC learning for 180 seconds.
Step 3	switch(config)# mac address-table loop-detect port-down edge-port	Enables the err-disabled detection for the edge-port on the MAC move loop detection.

This example shows how to configure port-down as the action for MAC move loop detection.

```
switch# configure terminal
switch(config) # mac address-table loop-detect port-down
```

This example shows how to enable the err-disabled detection for the edge-port on the MAC move loop detection.

```
switch# configure terminal
switch(config) # mac address-table loop-detect port-down edge-port
```

Clearing Dynamic Addresses from the MAC Table

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# clear mac-address-table dynamic {address <i>mac-addr</i> } {interface [<i>type slot/port</i> <i>port-channel number</i>] {vlan <i>vlan-id</i> }	Clears the dynamic address entries from the MAC address table.

Enabling RMAC Learning Feature

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# [no] mac address-table router-mac learn-enable	Enables/disables the RMAC learning feature. <ul style="list-style-type: none"> You can use the clear mac address-table dynamic command to clear the learned MAC addresses.

Verifying the MAC Address Configuration

Use one of the following commands to verify the configuration:

Table 1: MAC Address Configuration Verification Commands

Command	Purpose
show mac-address-table aging-time	Displays the MAC address aging time for all VLANs defined in the switch.
show mac-address-table	Displays the contents of the MAC address table. Note IGMP snooping learned MAC addresses are not displayed.
show mac address-table loop-detect	Displays the currently configured action.

This example shows how to display the MAC address table:

```
switch# show mac-address-table
VLAN      MAC Address      Type      Age      Port
-----+-----+-----+-----+-----
1         0018.b967.3cd0   dynamic   10       Eth1/3
1         001c.b05a.5380   dynamic   200      Eth1/3
Total MAC Addresses: 2
```

This example shows how to display the current aging time:

```
switch# show mac-address-table aging-time
Vlan      Aging Time
-----+-----
1         300
13        300
42        300
```

This example shows how to display the currently configured action:

```
switch# configure terminal
switch(config)# show mac address-table loop-detect
Port Down Action Mac Loop Detect : enabled
```

```
switch# configure terminal
switch(config)# no mac address-table loop-detect port-down
switch(config)# show mac address-table loop-detect
Port Down Action Mac Loop Detect : disabled
```

Verifying RMAC Learning Feature

Use the `show mac address-table interface type slot/port vlan vlan_id` command to display the information about the MAC address table. In the sample output given below, RMAC is learned on Ethernet 1/33.

```
switch# show mac address-table interface ethernet 1/33 vlan 2

Legend:
      * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
      age - seconds since last seen, + - primary entry using vPC Peer-Link
      VLAN      MAC Address      Type      age      Secure NTFY  Ports/SWID.SSID.LID
-----+-----+-----+-----+-----+-----
* 2          002a.6aca.b6bc   dynamic   20       F      F  Eth1/33
```

