Configuring MAC ACLs

This chapter describes how to configure MAC access lists (ACLs) on Cisco NX-OS devices.

This chapter contains the following sections:

- Finding Feature Information, on page 1
- Information About MAC ACLs, on page 1
- Prerequisites for MAC ACLs, on page 2
- Guidelines and Limitations for MAC ACLs, on page 2
- Default Settings for MAC ACLs, on page 2
- Configuring MAC ACLs, on page 3
- Verifying the MAC ACL Configuration, on page 10
- Monitoring and Clearing MAC ACL Statistics, on page 10
- Configuration Example for MAC ACLs, on page 10
- Additional References for MAC ACLs, on page 11
- Feature History for MAC ACLs, on page 11

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://bst.cloudapps.cisco.com/bugsearch and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information"chapter or the Feature History table in this chapter.

Information About MAC ACLs

MAC ACLs are ACLs that use information in the Layer 2 header of packets to filter traffic. MAC ACLs share many fundamental concepts with IP ACLs, including support for virtualization.

Related Topics

Information About ACLs

MAC Packet Classification

MAC packet classification allows you to control whether a MAC ACL that is on a Layer 2 interface applies to all traffic entering the interface, including IP traffic, or to non-IP traffic only.

MAC packet classification does not work on the Layer 3 control plane protocols such as HSRP, VRRP, OSPF, and so on. If you enable MAC packet classification on the VLANs, the basic functionalities will break on these protocols.

MAC Packet Classification State	Effect on Interface
Enabled	• A MAC ACL that is on the interface applies to all traffic entering the interface, including IP traffic. • You cannot apply an IP port ACL on the interface.
Disabled	• A MAC ACL that is on the interface applies only to non-IP traffic entering the interface. • You can apply an IP port ACL on the interface.

Related Topics

Enabling or Disabling MAC Packet Classification, on page 8

Prerequisites for MAC ACLs

There are no prerequisites for configuring MAC ACLs.

Guidelines and Limitations for MAC ACLs

MAC ACLs have the following configuration guidelines and limitations:

- MAC ACLs apply to ingress traffic only.
- ACL statistics are not supported if the DHCP snooping feature is enabled.

Default Settings for MAC ACLs

This table lists the default settings for MAC ACL parameters.

Table 1: Default MAC ACLs Parameters

Parameters	Default
MAC ACLs	No MAC ACLs exist by default
ACL rules	Implicit rules apply to all ACLs

Configuring MAC ACLs

Creating a MAC ACL

You can create a MAC ACL and add rules to it.

SUMMARY STEPS

1. **configure terminal**
2. **mac access-list** *name*
3. {**permit** | **deny**} *source destination protocol*
4. (Optional) **statistics per-entry**
5. (Optional) **show mac access-lists** *name*
6. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**mac access-list** *name*
	Example:
	`switch(config)# mac access-list acl-mac-01`
	`switch(config-mac-acl)#`
		Creates the MAC ACL and enters ACL configuration mode.

Step 3	{**permit** | **deny**} *source destination protocol* **Example:** `switch(config-mac-acl)# permit 00c0.4f00.0000 0000.00ff.ffff any`	Creates a rule in the MAC ACL. The **permit** and **deny** commands support many ways of identifying traffic. For more information, see the *Cisco Nexus 7000 Series NX-OS Security Command Reference*.
Step 4	(Optional) **statistics per-entry** **Example:** `switch(config-mac-acl)# statistics per-entry`	Specifies that the device maintains global statistics for packets that match the rules in the ACL.
Step 5	(Optional) **show mac access-lists** *name* **Example:** `switch(config-mac-acl)# show mac access-lists acl-mac-01`	Displays the MAC ACL configuration.

	Command or Action	Purpose
Step 6	(Optional) **copy running-config startup-config** **Example:** `switch(config-mac-acl)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Changing a MAC ACL

You can remove a MAC ACL from the device.

Before you begin

Use the **show mac access-lists** command with the summary keyword to find the interfaces that a MAC ACL is configured on.

SUMMARY STEPS

1. **configure terminal**
2. **mac access-list** *name*
3. (Optional) [*sequence-number*] {**permit** | **deny**} *source destination protocol*
4. (Optional) **no** {*sequence-number* | {**permit** | **deny**} *source destination protocol*}
5. (Optional) [**no**] **statistics per-entry**
6. (Optional) **show mac access-lists** *name*
7. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**mac access-list** *name*
	Example:
	`switch(config)# mac access-list acl-mac-01`
	`switch(config-mac-acl)#`
		Enters ACL configuration mode for the ACL that you specify by name.

Step 3	(Optional) [*sequence-number*] {**permit**	**deny**} *source destination protocol* **Example:** `switch(config-mac-acl)# 100 permit mac 00c0.4f00.00 0000.00ff.ffff any`	Creates a rule in the MAC ACL. Using a sequence number allows you to specify a position for the rule in the ACL. Without a sequence number, the rule is added to the end of the rules.

	Command or Action	Purpose
		The **permit** and **deny** commands support many ways of identifying traffic. For more information, see the *Cisco Nexus 7000 Series NX-OS Security Command Reference*.
Step 4	(Optional) **no** {*sequence-number* | {**permit** | **deny**} *source destination protocol*} **Example:** `switch(config-mac-acl)# no 80`	Removes the rule that you specify from the MAC ACL. The **permit** and **deny** commands support many ways of identifying traffic. For more information, see the *Cisco Nexus 7000 Series NX-OS Security Command Reference*.
Step 5	(Optional) [**no**] **statistics per-entry** **Example:** `switch(config-mac-acl)# statistics per-entry`	Specifies that the device maintains global statistics for packets that match the rules in the ACL. The **no** option stops the device from maintaining global statistics for the ACL.
Step 6	(Optional) **show mac access-lists** *name* **Example:** `switch(config-mac-acl)# show mac access-lists acl-mac-01`	Displays the MAC ACL configuration.
Step 7	(Optional) **copy running-config startup-config** **Example:** `switch(config-mac-acl)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Changing Sequence Numbers in a MAC ACL

You can change all the sequence numbers assigned to rules in a MAC ACL. Resequencing is useful when you need to insert rules into an ACL and there are not enough available sequence numbers.

SUMMARY STEPS

1. **configure terminal**
2. **resequence mac access-list** *name starting-sequence-number increment*
3. (Optional) **show mac access-lists** *name*
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

	Command or Action	Purpose
Step 2	**resequence mac access-list** *name starting-sequence-number increment* **Example:** `switch(config)# resequence mac access-list acl-mac-01 100 10`	Assigns sequence numbers to the rules contained in the ACL, where the first rule receives the number specified by the starting-sequence number that you specify. Each subsequent rule receives a number larger than the preceding rule. The difference in numbers is determined by the increment number that you specify.
Step 3	(Optional) **show mac access-lists** *name* **Example:** `switch(config)# show mac access-lists acl-mac-01`	Displays the MAC ACL configuration.
Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Removing a MAC ACL

You can remove a MAC ACL from the device.

SUMMARY STEPS

1. **configure terminal**
2. **no mac access-list** *name*
3. (Optional) **show mac access-lists** *name* **summary**
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**no mac access-list** *name*
	Example:
	`switch(config)# no mac access-list acl-mac-01`
	`switch(config)#`
		Removes the MAC ACL that you specify by name from the running configuration.

Step 3	(Optional) **show mac access-lists** *name* **summary** **Example:** `switch(config)# show mac access-lists acl-mac-01 summary`	Displays the MAC ACL configuration. If the ACL remains applied to an interface, the command lists the interfaces.

	Command or Action	Purpose
Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Applying a MAC ACL as a Port ACL

You can apply a MAC ACL as a port ACL to any of the following interface types:

- Layer 2 or Layer 3 Ethernet interfaces
- Layer 2 or Layer 3 port-channel interfaces

Before you begin

Ensure that the ACL that you want to apply exists and is configured to filter traffic in the manner that you need for this application.

SUMMARY STEPS

1. **configure terminal**
2. Enter one of the following commands:
   - **interface ethernet** *slot*/*port*
   - **interface port-channel** *channel-number*
3. **mac port access-group** *access-list*
4. (Optional) **show running-config aclmgr**
5. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	Enter one of the following commands:
	• **interface ethernet** *slot*/*port*
	• **interface port-channel** *channel-number*
	Example:
	`switch(config)# interface ethernet 2/1`
	`switch(config-if)#`
	Example:
		• Enters interface configuration mode for a Layer 2 or Layer 3 interface.
		• Enters interface configuration mode for a Layer 2 or Layer 3 port-channel interface.

	Command or Action	Purpose
	`switch(config)# interface port-channel 5` `switch(config-if)#`	
Step 3	**mac port access-group** *access-list* **Example:** `switch(config-if)# mac port access-group acl-01`	Applies a MAC ACL to the interface.
Step 4	(Optional) **show running-config aclmgr** **Example:** `switch(config-if)# show running-config aclmgr`	Displays ACL configuration.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-if)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Applying a MAC ACL as a VACL

You can apply a MAC ACL as a VACL.

Related Topics

Configuring VACLs

Enabling or Disabling MAC Packet Classification

You can enable or disable MAC packet classification on a Layer 2 interface.

Before you begin

The interface must be configured as a Layer 2 interface. Note that the M1 and M2 Series modules do not support IP ACLs on port ACL and VACL policies, when the MAC packet classification feature is enabled on the interface. Before you upgrade to Cisco NX-OS Release 6.x or later versions, you need to disable the MAC packet classification feature on M1 and M2 Series modules, and verify whether all the existing functionalities work. This limitation is not applicable for M3 series modules.

Note If the interface is configured with the **ip port access-group** command or the **ipv6 port traffic-filter** command, you cannot enable MAC packet classification until you remove the **ip port access-group** and **ipv6 port traffic-filter** commands from the interface configuration.

SUMMARY STEPS

1. **configure terminal**
2. Enter one of the following commands:
   - **interface ethernet** *slot/port*
   - **interface port-channel** *channel-number*

3. [**no**] **mac packet-classify**
4. (Optional) Enter one of the following commands:
   - **show running-config interface ethernet** *slot*/*port*
   - **show running-config interface port-channel** *channel-number*
5. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	Enter one of the following commands:
	• **interface ethernet** *slot*/*port*
	• **interface port-channel** *channel-number*
	Example:
	`switch(config)# interface ethernet 2/1`
	`switch(config-if)#`
	Example:
	`switch(config)# interface port-channel 5`
	`switch(config-if)#`
		• Enters interface configuration mode for a Ethernet interface.
		• Enters interface configuration mode for a port-channel interface.

Step 3	[**no**] **mac packet-classify** **Example:** `switch(config-if)# mac packet-classify`	Enables MAC packet classification on the interface. The **no** option disables MAC packet classification on the interface.

Step 4	(Optional) Enter one of the following commands:
	• **show running-config interface ethernet** *slot*/*port*
	• **show running-config interface port-channel** *channel-number*
	Example:
	`switch(config-if)# show running-config interface ethernet 2/1`
	Example:
	`switch(config-if)# show running-config interface port-channel 5`
		• Displays the running configuration of the Ethernet interface.
		• Displays the running configuration of the port-channel interface.

Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-if)# copy running-config startup-config`	Copies the running configuration to the startup configuration.

Related Topics

MAC Packet Classification, on page 2

Verifying the MAC ACL Configuration

To display MAC ACL configuration information, perform one of the following tasks. For detailed information about the fields in the output from these commands, see the *Cisco Nexus 7000 Series NX-OS Security Command Reference*.

Command	Purpose
show mac access-lists	Displays the MAC ACL configuration.
show running-config aclmgr [**all**]	Displays the ACL configuration, including MAC ACLs and the interfaces to which MAC ACLs are applied.
show startup-config aclmgr [**all**]	Displays the ACL startup configuration.

Monitoring and Clearing MAC ACL Statistics

Use the **show mac access-lists** command to monitor statistics about a MAC ACL, including the number of packets that have matched each rule.

To monitor or clear MAC ACL statistics, use one of the commands in this table. For detailed information about these commands, see the *Cisco Nexus 7000 Series NX-OS Security Command Reference*.

Command	Purpose
show mac access-lists	Displays the MAC ACL configuration. If the MAC ACL includes the statistics per-entry command, the **show mac access-lists** command output includes the number of packets that have matched each rule.
clear mac access-list counters	Clears statistics for all MAC ACLs or for a specific MAC ACL.

Configuration Example for MAC ACLs

The following example shows how to create a MAC ACL named acl-mac-01 and apply it to Ethernet interface 2/1, which is a Layer 2 interface in this example:

```
mac access-list acl-mac-01
  permit 00c0.4f00.0000 0000.00ff.ffff any
interface ethernet 2/1
  mac port access-group acl-mac-01
```

Additional References for MAC ACLs

Related Documents

Related Topic	Document Title
MAC ACL commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples	*Cisco Nexus 7000 Series NX-OS Security Command Reference*

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 MAC ACLs

This table lists the release history for this feature.

Table 2: Feature History for MAC ACLs

Feature Name	Releases	Feature Information
MAC ACLs	6.1(1)	Updated for M2 Series modules.
MAC ACLs	6.0(1)	Updated for F2 Series modules.
MAC ACLs	5.2(1)	Changed the **show running-config aclmgr** and **show startup-config aclmgr** commands to display only the user-configured ACLs (and not also the default CoPP-configured ACLs) in the running and startup configurations.
MAC ACLs	5.0(2)	Support was added for up to 128,000 ACL entries when using an XL line card, provided a scalable services license is installed.

Feature Name	Releases	Feature Information
MAC ACLs	4.2(1)	Support was added for MAC packet classification.