IPv4 ACL Chaining Support

ACL Chaining, also known as Multi-Access Control List, allows you to split access control lists (ACLs). This module describes how with the IPv4 ACL Chaining Support feature, you can explicitly split ACLs into common and user-specific ACLs and bind both ACLs to a target for traffic filtering on a device. In this way, the common ACLs in Ternary Content Addressable Memory (TCAM) are shared by multiple targets, thereby reducing the resource usage.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and 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 feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Restrictions for IPv4 ACL Chaining Support

- A single access control List (ACL) cannot be used for both common and regular ACLs for the same target in the same direction.
- ACL chaining applies to only security ACLs. It is not supported for feature policies, such as Quality of Service (QoS), Firewall Services Module (FW) and Policy Based Routing (PBR).
- Per-target statistics are not supported for common ACLs.

Information About IPv4 ACL Chaining Support

ACL Chaining Overview

The packet filter process supports only a single Access control list (ACL) to be applied per direction and per protocol on an interface. This leads to manageability and scalability issues if there are common ACL entries needed on many interfaces. Duplicate Access control entries (ACEs) are configured for all those interfaces, and any modification to the common ACEs needs to be performed for all ACLs.

A typical ACL on the edge box for an Internet Service Provider (ISP) has two sets of ACEs:

- Common ISP specific ACEs
- Customer/interface specific ACEs

The purpose of these address blocks is to deny access to ISP's protected infrastructure networks and anti-spoofing protection by allowing only customer source address blocks. This results in configuring unique ACL per interface and most of the ACEs being common across all ACLs on a device. ACL provisioning and modification is very cumbersome, hence, any changes to the ACE impacts every target.

IPv4 ACL Chaining Support

IPv4 ACL Chaining Support allows you to split the Access control list (ACL) into common and customer-specific ACLs and attach both ACLs to a common session. In this way, only one copy of the common ACL is attached to Ternary Content Addressable Memory (TCAM) and shared by all users, thereby making it easier to maintain the common ACEs.

The IPv4 ACL Chaining feature allows two IPV4 ACLs to be active on an interface per direction:

- Common
- Regular
- Common and Regular

Note If you configure both common and regular ACLs on an interface, the common ACL is considered over a regular ACL.

How to Configure IPv4 ACL Chaining Support

ACL chaining is supported by extending the **ip traffic filter** command.

The **ip traffic filter** command is not additive. When you use this command, it replaces earlier instances of the command.

For more information, refer to the *IPv6 ACL Chaining with a Common ACL* section in the Security Configuration Guide: Access Control Lists Configuration Guide.

Configuring an Interface to Accept Common ACL

Perform this task to configure the interface to accept a common Access control list (ACL) along with an interface-specific ACL:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*}
4. **ip access-group** {**common** {*common-access-list-name* {*regular-access-list* | **acl**}}{**in** | **out**}}
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number*} **Example:** `Device(config)# interface gigabitethernet 0/0/0`	Configures an interface (in this case a gigabitethernet interface) and enters the interface configuration mode.
Step 4	**ip access-group** {**common** {*common-access-list-name* {*regular-access-list*	**acl**}}{**in**	**out**}} **Example:** `Device(config)# ipv4 access-group common acl-p acl1 in`	Configures the interface to accept a common ACL along with the interface-specific ACL.
Step 5	**end** **Example:** `Device(config-if)# end`	(Optional) Exits the configuration mode and returns to privileged EXEC mode.

Configuration Examples for IPv4 ACL Chaining Support

This section provides configuration examples of Common Access Control List (ACL).

Example: Configuring an Interface to Accept a Common ACL

This example shows how to replace an Access Control List (ACL) configured on the interface without explicitly deleting the ACL:

```
interface gigabitethernet 0/0/0
ipv4 access-group common  C_acl ACL1 in
end
replace interface acl ACL1 by ACL2
interface gigabitethernet 0/0/0
ipv4 access-group common  C_acl ACL2 in
end
```

This example shows how common ACL cannot be replaced on interfaces without deleting it explicitly from the interface:

```
interface gigabitethernet 0/0/0
ipv4 access-group common  C_acl1 ACL1 in
end
change the common acl to C_acl2
interface gigabitethernet 0/0/0
no ipv4 access-group common  C_acl1  ACL1 in
end
interface gigabitethernet 0/0/0
ipv4 access-group common  C_acl2  ACL1 in
end
```

Note When reconfiguring a common ACL, you must ensure that no other interface on the line card is attached to the common ACL.

Note If both common ACL and interface ACL are attached to an interface and only one of the above is reconfigured on the interface, then the other is removed automatically.

This example shows how the interface ACL is removed:

```
interface gigabitethernet 0/0/0
ipv4 access-group common C_acl1 ACL1 in
end
```

Additional References for IPv4 ACL Chaining Support

Related Documents

Related Topic	Document Title
IPv6 ACL Chaining Support	

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
Security commands	• Cisco IOS Security Command Reference: Commands A to C • Cisco IOS Security Command Reference: Commands D to L • Cisco IOS Security Command Reference: Commands M to R • Cisco IOS Security Command Reference: Commands S to Z

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

Feature Information for IPv4 ACL Chaining Support

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for IPv4 ACL Chaining Support

Feature Name	Releases	Feature Information
IPv4 ACL Chaining Support	Cisco IOS XE Release 3.11S Cisco IOS XE Release 3.6E	The IPv4 ACL Chaining Support feature describes how you can explicitly split Access control lists (ACLs) into common and user-specific ACLs and bind both ACLs to a session for traffic filtering on a device. In this way, the common ACLs in Ternary Content Addressable Memory (TCAM) are shared by multiple targets, thereby reducing the resource usage. The following commands were introduced or modified: **ip access-group command**.