



IPv6 Access Control Lists

Access lists determine what traffic is blocked and what traffic is forwarded at device interfaces and allow filtering of traffic based on source and destination addresses, and inbound and outbound traffic to a specific interface. Standard IPv6 ACL functionality was extended to support traffic filtering based on IPv6 option headers and optional, upper-layer protocol type information for finer granularity of control. Standard IPv6 ACL functionality was extended to support traffic filtering based on IPv6 option headers and optional, upper-layer protocol type information for finer granularity of control.

This module describes how to configure IPv6 traffic filtering and to control access to virtual terminal lines.

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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 <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Restrictions for IPv6 Access Control Lists

- IPv4 ACL is not supported on member link.
- IPv4 or IPv6 is not supported on label interface.
- **permit ipv6 any any** command is not supported.
- **clear counters** command is not supported.

- MAC ACL supports only non-IP packets.
- MAC ACL counters are *not* supported.
- MAC ACL is *not* supported on trunk EFP or port channel EFP.
- TCAMS are programmed for ACL configured on both physical interface and BDI.
- IPv4 and IPv6 ACLs together are supported on the Routed & BDI interface .
- Layer 3 IPv4 and IPv6 ACLs together are *not* supported on same EVC, only one of the ACL (either IPv4 and IPv6) is supported.
- ICMPv6 NDP packets type 133-137 does not hit user configured ingress ACL rule, as traffic are punted to MCAST Q with control entries.
- Clearing of ACL named or numbered counters for both Ipv4 and Ipv6 is not supported.
- Supported IPv6 ACL parameters are source address, destination address, DSCP, fragment, Layer 4 TCP/UDP and TCP/UDP port numbers. However, IPv6 extension header is not supported in ACL.
- IPv6 TCP packets with URG bit set is not supported.

Information About IPv6 Access Control Lists

Access Control Lists for IPv6 Traffic Filtering

The standard ACL functionality in IPv6 is similar to standard ACLs in IPv4. Access lists determine what traffic is blocked and what traffic is forwarded at device interfaces and allow filtering based on source and destination addresses, inbound and outbound to a specific interface. Each access list has an implicit deny statement at the end. IPv6 ACLs are defined and their deny and permit conditions are set using the **ipv6 access-list** command with the **deny** and **permit** keywords in global configuration mode.

IPv6 extended ACLs augments standard IPv6 ACL functionality to support traffic filtering based on IPv6 option headers and optional, upper-layer protocol type information for finer granularity of control (functionality similar to extended ACLs in IPv4).

IPv6 Packet Inspection

The following header fields are used for IPv6 inspection: traffic class, flow label, payload length, next header, hop limit, and source or destination IP address. For further information on and descriptions of the IPv6 header fields, see RFC 2474.

Access Class Filtering in IPv6

Filtering incoming and outgoing connections to and from the device based on an IPv6 ACL is performed using the **ipv6 access-class** command in line configuration mode. The **ipv6 access-class** command is similar to the **access-class** command, except the IPv6 ACLs are defined by a name. If the IPv6 ACL is applied to inbound traffic, the source address in the ACL is matched against the incoming connection source address and the destination address in the ACL is matched against the local device address on the interface. If the IPv6 ACL is applied to outbound traffic, the source address in the ACL is matched against the local device address on the interface and the destination address in the ACL is matched against the outgoing connection

source address. We recommend that identical restrictions are set on all the virtual terminal lines because a user can attempt to connect to any of them.

How to Configure IPv6 Access Control Lists

Configuring IPv6 Traffic Filtering

Creating and Configuring an IPv6 ACL for Traffic Filtering

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 access-list <i>access-list-name</i> Example: Device(config)# ipv6 access-list outbound	Defines an IPv6 ACL, and enters IPv6 access list configuration mode. <ul style="list-style-type: none"> • The <i>access-list name</i> argument specifies the name of the IPv6 ACL. IPv6 ACL names cannot contain a space or quotation mark, or begin with a numeral.
Step 4	Do one of the following: <ul style="list-style-type: none"> • permit protocol { <i>source-ipv6-prefix/prefix-length</i> any host <i>source-ipv6-address</i> } [<i>operator</i> [<i>port-number</i>]] { <i>destination-ipv6-prefix / prefix-length</i> any host <i>destination-ipv6-address</i> } [operator [<i>port-number</i>]] [dest-option-type [<i>doh-number</i> <i>doh-type</i>]] [dscp <i>value</i>] [flow-label <i>value</i>] [fragments] [log] [log-input] [mobility] [mobility-type [<i>mh-number</i> <i>mh-type</i>]] [routing] [routing-type <i>routing-number</i>] [sequence <i>value</i>] [time-range <i>name</i>] • deny protocol { <i>source-ipv6-prefix/prefix-length</i> any 	Specifies permit or deny conditions for an IPv6 ACL.

	Command or Action	Purpose
	<p>host <i>source-ipv6-address</i> [<i>operator port-number</i>] {<i>destination-ipv6-prefix/prefix-length</i> any host <i>destination-ipv6-address</i> } [<i>operator</i> [<i>port-number</i>]] [dest-option-type [<i>doh-number</i> <i>doh-type</i>]] [dscp <i>value</i>] [flow-label <i>value</i>] [fragments] [log] [log-input] [mobility] [mobility-type [<i>mh-number</i> <i>mh-type</i>]] [routing] [routing-type <i>routing-number</i>] [sequence <i>value</i>] [time-range <i>name</i>] [undetermined-transport]</p> <p>Example:</p> <pre>Device(config-ipv6-acl)# permit tcp 2001:DB8:0300:0201::/32 eq telnet any</pre> <p>Example:</p> <pre>Device(config-ipv6-acl)# deny tcp host 2001:DB8:1::1 any log-input</pre>	

Applying the IPv6 ACL to an Interface

Procedure

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example:</p> <pre>Device> enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<p>configure terminal</p> <p>Example:</p> <pre>Device# configure terminal</pre>	<p>Enters global configuration mode.</p>
Step 3	<p>interface <i>type slot/subslot/port</i></p> <p>Example:</p> <pre>Router(config)# interface GigabitEthernet 0/0/1</pre>	<p>Specifies an interface and enters interface configuration mode.</p>
Step 4	<p>ipv6 traffic-filter <i>access-list-name</i> {in out}</p> <p>Example:</p> <pre>Device(config-if)# ipv6 traffic-filter outbound out</pre>	<p>Applies the specified IPv6 access list to the interface specified in the previous step.</p>

Controlling Access to a vty

Creating an IPv6 ACL to Provide Access Class Filtering

Procedure

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 access-list <i>access-list-name</i> Example: Device(config)# ipv6 access-list cisco	Defines an IPv6 ACL, and enters IPv6 access list configuration mode.
Step 4	Do one of the following: <ul style="list-style-type: none"> • permit protocol { <i>source-ipv6-prefix/prefix-length</i> any host <i>source-ipv6-address</i> } [operator [port-number]] { <i>destination-ipv6-prefix / prefix-length</i> any host <i>destination-ipv6-address</i> } [operator [port-number]] [dest-option-type [doh-number doh-type]] [dscp value] [flow-label value] [fragments] [log] [log-input] [mobility] [mobility-type [mh-number mh-type]] [routing] [routing-type routing-number] [sequence value] [time-range name] • deny protocol { <i>source-ipv6-prefix/prefix-length</i> any host <i>source-ipv6-address</i> } [operator port-number]] { <i>destination-ipv6-prefix/prefix-length</i> any host <i>destination-ipv6-address</i> } [operator [port-number]] [dest-option-type [doh-number doh-type]] [dscp value] [flow-label value] [fragments] [log] [log-input] [mobility] [mobility-type [mh-number mh-type]] [routing] [routing-type routing-number] 	Specifies permit or deny conditions for an IPv6 ACL.

	Command or Action	Purpose
	<p>[sequence value] [time-range name] [undetermined-transport]</p> <p>Example:</p> <pre>Device(config-ipv6-acl)# permit tcp host 2001:DB8:0:4::32 any eq telnet</pre> <p>Example:</p> <pre>Device(config-ipv6-acl)# deny tcp host 2001:DB8:0:6::32</pre>	

Applying an IPv6 ACL to the Virtual Terminal Line

Procedure

	Command or Action	Purpose
Step 1	<p>enable</p> <p>Example:</p> <pre>Device> enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<p>configure terminal</p> <p>Example:</p> <pre>Device# configure terminal</pre>	<p>Enters global configuration mode.</p>
Step 3	<p>line [aux console tty vty] <i>line-number[ending-line-number]</i></p> <p>Example:</p> <pre>Device(config)# line vty 0 4</pre>	<p>Identifies a specific line for configuration and enters line configuration mode.</p> <ul style="list-style-type: none"> • In this example, the vty keyword is used to specify the virtual terminal lines for remote console access.
Step 4	<p>ipv6 access-class <i>ipv6-access-list-name</i> {in out}</p> <p>Example:</p> <pre>Device(config-line)# ipv6 access-class cisco in</pre>	<p>Filters incoming and outgoing connections to and from the device based on an IPv6 ACL.</p>

Configuration Examples for IPv6 Access Control Lists

Example: Verifying IPv6 ACL Configuration

In this example, the `show ipv6 access-list` command is used to verify that IPv6 ACLs are configured correctly:

```
Device> show ipv6 access-list

IPv6 access list inbound
  permit tcp any any eq bgp (8 matches) sequence 10
  permit tcp any any eq telnet (15 matches) sequence 20
  permit udp any any sequence 30

IPv6 access list Virtual-Access2.1#427819008151 (per-user)
  permit tcp host 2001:DB8:1::32 eq bgp host 2001:DB8:2::32 eq 11000 sequence 1
  permit tcp host 2001:DB8:1::32 eq telnet host 2001:DB8:2::32 eq 11001 sequence 2
```

Example: Creating and Applying an IPv6 ACL

The following example shows how to restrict HTTP access to certain hours during the day and log any activity outside of the permitted hours:

```
Device# configure terminal
Device(config)# time-range lunchtime
Device(config-time-range)# periodic weekdays 12:00 to 13:00
Device(config-time-range)# exit
Device(config)# ipv6 access-list INBOUND
Device(config-ipv6-acl)# permit tcp any any eq www time-range lunchtime
Device(config-ipv6-acl)# deny tcp any any eq www log-input
Device(config-ipv6-acl)# permit tcp 2001:DB8::/32 any
Device(config-ipv6-acl)# permit udp 2001:DB8::/32 any
Device(config-ipv6-acl)# end
```

Example: Controlling Access to a vty

In the following example, incoming connections to the virtual terminal lines 0 to 4 are filtered based on the IPv6 access list named `acl1`:

```
ipv6 access-list acl1
  permit ipv6 host 2001:DB8:0:4::2/32 any
  !
line vty 0 4
  ipv6 access-class acl1 in
```

Additional References

Related Documents

Related Topic	Document Title
IP access list commands	<i>Cisco IOS Security Command Reference</i>
Configuring IP access lists	<i>Creating an IP Access List and Applying It to an Interface</i>

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IPv6 Access Control Lists

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.

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Table 1: Feature Information for IPv6 Access Control Lists

Feature Name	Releases	Feature Information
IPv6 Access Control Lists	Cisco IOS XE Release 3.14.0S	This feature was introduced on the Cisco ASR 920 Series Aggregation Services Router (ASR-920-12CZ-A, ASR-920-12CZ-D, ASR-920-4SZ-A, ASR-920-4SZ-D, ASR-920-10SZ-PD, ASR-920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M) .