



Application-Aware Access List



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Table of Contents

	About the Documentation	vii
	Documentation and Release Notes	vii
	Supported Platforms	vii
	Using the Examples in This Manual	vii
	Merging a Full Example	viii
	Merging a Snippet	viii
	Documentation Conventions	ix
	Documentation Feedback	xi
	Requesting Technical Support	xi
	Self-Help Online Tools and Resources	xi
	Opening a Case with JTAC	xii
Part 1	Overview	
Chapter 1	Application-Aware Access List	3
	AACL Overview	3
Part 2	Configuration	
Chapter 2	Configuration Tasks for AACL	7
	Configuring AACL Rules	7
	Configuring Match Direction for AACL Rules	8
	Configuring Match Conditions in AACL Rules	8
	Configuring Actions in AACL Rules	10
	Logging AACL Flows Based on Application	11
	Configuring AACL Rule Sets	11
Chapter 3	AACL Example	13
	Example: Configuring AACL Rules	13
Chapter 4	AACL Configuration Statements	15
	applications (Services AACL)	15
	application-groups (Services AACL)	15
	application-group-any	16
	destination-address	16
	destination-address-range	17
	destination-prefix-list	17
	from	18
	log (aACL)	19
	match-direction	19
	rule	20
	rule-set (Services AACL)	21

	services (AACL)	21
	source-address (AACL)	22
	source-address-range	22
	source-prefix-list	23
	term	24
	then	25
Part 3	Administration	
Chapter 5	AACL Operational Mode Commands	29
	clear services application-aware-access-list statistics	30
	show services application-aware-access-list statistics	31
	show services application-aware-access-list flows	33
Part 4	Index	
	Index	39

List of Tables

	About the Documentation	vii
	Table 1: Notice Icons	ix
	Table 2: Text and Syntax Conventions	ix
Part 3	Administration	
Chapter 5	AACL Operational Mode Commands	29
	Table 3: show services application-aware-access-list statistics Output Fields	31
	Table 4: show services application-aware-access-list flows Output Fields	33

About the Documentation

- Documentation and Release Notes on page vii
- Supported Platforms on page vii
- Using the Examples in This Manual on page vii
- Documentation Conventions on page ix
- Documentation Feedback on page xi
- Requesting Technical Support on page xi

Documentation and Release Notes

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If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

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Supported Platforms

For the features described in this document, the following platforms are supported:

- MX Series

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

```
system {
  scripts {
    commit {
      file ex-script.xml;
    }
  }
}
interfaces {
  fxp0 {
    disable;
    unit 0 {
      family inet {
        address 10.0.0.1/24;
      }
    }
  }
}
```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

```
[edit]
user@host# load merge /var/tmp/ex-script.conf
load complete
```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

```
commit {
  file ex-script-snippet.xml; }
```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:


```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see the CLI User Guide.

Documentation Conventions

Table 1 on page ix defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Table 2 on page ix defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> show chassis alarms No alarms currently active

Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
<i>Italic text like this</i>	<ul style="list-style-type: none"> Introduces or emphasizes important new terms. Identifies book names. Identifies RFC and Internet draft titles. 	<ul style="list-style-type: none"> A policy <i>term</i> is a named structure that defines match conditions and actions. <i>Junos OS System Basics Configuration Guide</i> RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast <i>(string1 string2 string3)</i>
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [community-ids]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
J-Web GUI Conventions		
Bold text like this	Represents J-Web graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of J-Web selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

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- Document or topic name
- URL or page number
- Software release version (if applicable)

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- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
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- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/>.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html>.

PART 1

Overview

- [Application-Aware Access List on page 3](#)

CHAPTER 1

Application-Aware Access List

- [AACL Overview on page 3](#)

AACL Overview

The application-aware access list (AACL) service adds support for a new service that uses application names and groups as matching criteria for filtering traffic. AACL is a stateless, rules-based service that must be combined with application identification to enable policies to be applied to flows based on application and application group membership in addition to traditional packet matching rules. It is supported on MX Series routers equipped with Multiservices DPCs and on M120 or M320 routers equipped with Multiservices 400 PICs. Starting with Junos OS Release 11.3, AACL is supported on T320, T640, and T1600 routers also.

AACL is configured in a similar way to other rules-based services such as Network Address Translation (NAT), class of service (CoS), and stateful firewall. To configure AACL, include rule specifications for match criteria and actions at the **[edit services aacl]** hierarchy level. You can chain AACL rules along with other service rules by including them in a service-set definition at the **[edit services service-set]** hierarchy level, as previously documented.

There is one pair of related operational commands, **show/clear application-aware-access-list statistics**.

For more information on the CLI configuration, see the Application-Aware Access List. For more information on the operational command, see the Junos OS Operational Mode Commands.

PART 2

Configuration

- [Configuration Tasks for ACL on page 7](#)
- [ACL Example on page 13](#)
- [ACL Configuration Statements on page 15](#)

CHAPTER 2

Configuration Tasks for AACL

- [Configuring AACL Rules on page 7](#)
- [Configuring AACL Rule Sets on page 11](#)

Configuring AACL Rules

To configure an AACL rule, include the **rule** *rule-name* statement at the **[edit services aacl]** hierarchy level:

```
rule rule-name {
  match-direction (input | output | input-output);
  term term-name {
    from {
      application-group-any;
      application-groups [ application-group-names ];
      applications [ application-names ];
      destination-address address <any-unicast>;
      destination-address-range low minimum-value high maximum-value;
      destination-prefix-list list-name;
      nested-applications [ nested-application-names ];
      nested-application-unknown
      source-address address <any-unicast>;
      source-address-range low minimum-value high maximum-value;
      source-prefix-list list-name;
    }
    then {
      (accept | discard);
      count (application | application-group | application-group-any | nested-application
        | none);
      forwarding-class class-name;
      policer policer-name;
    }
  }
}
```

Each AACL rule consists of a set of terms, similar to a filter configured at the **[edit firewall]** hierarchy level. A term consists of the following:

- **from** statement—Specifies the match conditions and applications that are included and excluded.

- **then** statement—Specifies the actions and action modifiers to be performed by the router software.

The following sections explain how to configure the components of ACL rules:

- [Configuring Match Direction for ACL Rules on page 8](#)
- [Configuring Match Conditions in ACL Rules on page 8](#)
- [Configuring Actions in ACL Rules on page 10](#)
- [Logging ACL Flows Based on Application on page 11](#)

Configuring Match Direction for ACL Rules

Each rule must include a **match-direction** statement that specifies the direction in which the rule match is applied. To configure where the match is applied, include the **match-direction** statement at the **[edit services acl rule *rule-name*]** hierarchy level:

```
match-direction (input | output | input-output);
```

If you configure **match-direction input-output**, bidirectional rule creation is allowed.

The match direction is used with respect to the traffic flow through the services PIC or DPC. When a packet is sent to the PIC or DPC, direction information is carried along with it.

With an interface service set, packet direction is determined by whether a packet is entering or leaving the interface on which the service set is applied.

With a next-hop service set, packet direction is determined by the interface used to route the packet to the services PIC or DPC. If the inside interface is used to route the packet, the packet direction is input. If the outside interface is used to direct the packet to the PIC or DPC, the packet direction is output. For more information on inside and outside interfaces, see *Configuring Service Sets to be Applied to Services Interfaces*.

On the PIC or DPC, a flow lookup is performed. If no flow is found, rule processing is performed. All rules in the service set are considered. During rule processing, the packet direction is compared against rule directions. Only rules with direction information that matches the packet direction are considered.

Configuring Match Conditions in ACL Rules

To configure ACL match conditions, include the **from** statement at the **[edit services acl rule *rule-name* term *term-name*]** hierarchy level:

```
from {  
  application-group-any;  
  application-groups [ application-group-names ];  
  applications [ application-names ];  
  destination-address address <any-unicast>;  
  destination-address-range low minimum-value high maximum-value;  
  destination-prefix-list list-name;  
  nested-applications [ nested-application-names ];  
  nested-application-unknown  
  source-address address <any-unicast>;  
}
```

```

source-address-range low minimum-value high maximum-value;
source-prefix-list list-name;
}

```

IPv4 and IPv6 source and destination addresses are supported. You can use either the source address or the destination address as a match condition, in the same way that you configure a firewall filter; for more information, see the Routing Policy Configuration Guide.

Alternatively, you can specify a list of source or destination prefixes by configuring the **prefix-list** statement at the **[edit policy-options]** hierarchy level and then including either the **destination-prefix-list** or the **source-prefix-list** statement in the ACL rule. For an example, see [“Example: Configuring ACL Rules” on page 13](#).

If you omit the **from** term, the ACL rule accepts all traffic and the default protocol handlers take effect:

- User Datagram Protocol (UDP), Transmission Control Protocol (TCP), and Internet Control Message Protocol (ICMP) create a bidirectional flow with a predicted reverse flow.
- IP creates a unidirectional flow.

You can also include application and application group definitions you have configured at the **[edit services application-identification]** hierarchy level; for more information, see the topics in Application Identification.

- To apply one or more specific application protocol definitions, include the **applications** statement at the **[edit services aacl rule rule-name term term-name from]** hierarchy level.
- To apply one or more sets of application group definitions you have defined, include the **application-groups** statement at the **[edit services aacl rule rule-name term term-name from]** hierarchy level.



NOTE: If you include one of the statements that specifies application protocols, the router derives port and protocol information from the corresponding configuration at the **[edit services application-identification]** hierarchy level; you cannot specify these properties as match conditions.

- To consider any application group defined in the database as a match, include the **application-group-any** statement at the **[edit services aacl rule rule-name term term-name from]** hierarchy level.
- To consider any nested application defined in the database a match, include the **nested-applications** statement at the **[edit services aacl rule rule-name term term-name from]** hierarchy level. Nested applications are protocols that run on a parent application. For example, if the Facebook application runs on the parent application `junos:http`, the nested application will be `junos:http:facebook`.

Configuring Actions in ACL Rules

To configure ACL actions, include the **then** statement at the **[edit services aacl rule rule-name term term-name]** hierarchy level:

```
then {  
  (accept | discard);  
  (count (application | application-group | application-group-any | nested-application |  
    none) | forwarding-class class-name);  
}
```

You must include one of the following actions:

- **accept**—The packet is accepted and sent on to its destination.
- **discard**—The packet is not accepted and is not processed further.

When you select **accept** as the action, you can optionally configure one or both of the following action modifiers. No action modifiers are allowed with the **discard** action.

- **count (application | application-group | application-group-any | nested-application | none)**—For all accepted packets that match the rules, record a packet count using ACL statistics practices. You can specify one of the following options; there is no default setting:
 - **application**—Count the application that matched in the **from** clause.
 - **application-group**—Count the application group that matched in the **from** clause.
 - **application-group-any**—Count all application groups that match **from application-group-any** under the **any** group name.
 - **nested-application**—Count all nested applications that matched in the **from** clause.
 - **none**—Same as not specifying **count** as an action.



NOTE:

- When a session closes before APPID has identified nested applications, the session is treated as a best-effort session and ACL does not get the nested application information. In such cases, nested applications will be reported as unknown applications.
- During the time that the application identification (APPID) feature has not yet made a final determination of the application associated with a given flow, the flow does not contribute to any per-subscriber or per-application statistics collection. For more information, see Best-Effort Application Identification of DPI-Serviced Flows.

-
- **forwarding-class class-name**—Specify the packets' forwarding-class name.

You can optionally include a **policer** that has been specified at the **[edit firewall]** hierarchy level. Only the bit-rate and burst-size properties specified for the policer are applied in

the AACL rule set. The only action application when a policer is configured is **discard**. For more information on policer definitions, see the Routing Policy Configuration Guide.

Logging AACL Flows Based on Application

You can now log AACL flows based on application. You can select a specific application or request information on unknown applications.

You can now configure AACL rules to match unknown applications. All existing actions that can apply to recognized applications can also apply to unknown applications. You can use the following statements at the **[edit services aacl rule rule-name term term-name from]** hierarchy level:

- application-group-any
- application-groups
- application-unknown
- applications
- nested-application-unknown
- nested-applications

The addition of matching “application unknown” enables the specific logging of the input flows associated with applications that cannot be identified. Because logging is triggered by an input event, you must specify **match-direction** as **input-output** or **input**.

To configure logging of flows for AACL, include the **match-direction input** or **match-direction input-output** statement at the **[edit services aacl rule rule-name]** hierarchy level, include an **applications** or **application-unknown** statement at the **[edit services aacl rule rule-name term term-name from]** hierarchy level, and include only one **log** statement at the **[edit services aacl rule rule-name term term-name then]** hierarchy level. The log statements can include any of the following options:

- session-start
- session-end
- session-start-end-no-stats
- session-start-interim-end
- session-interim-end
- session-end

Configuring AACL Rule Sets

The **rule-set** statement defines a collection of AACL rules that determine what actions the router software performs on packets in the data stream. You define each rule by specifying a rule name and configuring terms. Then, you specify the order of the rules by including the **rule-set** statement at the **[edit services aacl]** hierarchy level with a **rule** statement for each rule:

```
rule-set rule-set-name {  
  rule rule-name;  
}
```

The router software processes the rules in the order in which you specify them in the configuration. If a term in a rule matches the packet, the router performs the corresponding action and the rule processing stops. If no term in a rule matches the packet, processing continues to the next rule in the rule set. If none of the rules matches the packet, the packet is dropped by default.

CHAPTER 3

AACL Example

- [Example: Configuring AACL Rules on page 13](#)

Example: Configuring AACL Rules

The following example shows an AACL configuration containing a rule with three terms using a variety of match conditions and actions:

```
[edit services aacl]
rule aacl-test {
  match-direction input;
  term term1 {
    from {
      source-address 10.0.1.1
      application test1;
    }
    then {
      accept;
    }
  }
  term term2 {
    from {
      source-address {
        any-unicast;
      }
      application test1;
    }
    then {
      discard;
    }
  }
  term term3 {
    from {
      source-address {
        any-unicast;
      }
      application test1 test2;
    }
    then {
      accept;
      count application;
    }
  }
}
```

```
}  
}
```

CHAPTER 4

AACL Configuration Statements

applications (Services AACL)

Syntax	<code>applications [<i>application-names</i>];</code>
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Identify one or more applications defined in the application identification configuration for inclusion as a match condition.
Options	<i>application-names</i> —Identifiers of the applications.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

application-groups (Services AACL)

Syntax	<code>application-groups [<i>application-group-names</i>];</code>
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Identify one or more application groups defined in the application identification configuration for inclusion as a match condition.
Options	<i>application-group-names</i> —Identifiers of the application groups.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

application-group-any

Syntax	application-group-any;
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Indicates that any application group defined in the database is considered a match.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

destination-address

Syntax	destination-address <i>address</i> ;
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the destination address for rule matching.
Options	<i>address</i> —Destination IPv4 or IPv6 address or prefix value.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

destination-address-range

Syntax	<code>destination-address-range low <i>minimum-value</i> high <i>maximum-value</i>;</code>
Hierarchy Level	<code>[edit services aacl rule <i>rule-name</i> term <i>term-name</i> from]</code>
Release Information	Statement introduced in Junos OS Release 9.5. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the destination address range for rule matching.
Options	<i>minimum-value</i> —Lower boundary for the IPv4 or IPv6 address range. <i>maximum-value</i> —Upper boundary for the IPv4 or IPv6 address range.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Match Conditions in ACL Rules on page 8

destination-prefix-list

Syntax	<code>destination-prefix-list <i>list-name</i>;</code>
Hierarchy Level	<code>[edit services aacl rule <i>rule-name</i> term <i>term-name</i> from]</code>
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the destination prefix list for rule matching. You configure the prefix list by including the prefix-list statement at the [edit policy-options] hierarchy level.
Options	<i>list-name</i> —Destination prefix list.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Match Conditions in ACL Rules on page 8

from

Syntax	<pre>from { application-group-any; application-groups [<i>application-group-names</i>]; application-unknown; applications [<i>application-names</i>]; destination-address <i>address</i> <any-unicast>; destination-address-range low <i>minimum-value</i> high <i>maximum-value</i>; destination-prefix-list <i>list-name</i>; nested-application-unknown; source-address <i>address</i> <any-unicast>; source-address-range low <i>minimum-value</i> high <i>maximum-value</i>; source-prefix-list <i>list-name</i>; }</pre>
Hierarchy Level	[edit services aacl rule <i>rule-name</i> term <i>term-name</i>]
Release Information	Statement introduced before Junos OS Release 9.5.
Description	Specify match conditions for the AACL term.
Options	<p>For information on match conditions, see the description of firewall filter match conditions in the Routing Policy Configuration Guide.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring AACL Rules on page 7

log (aACL)

Syntax	log <i>event-type</i>
Hierarchy Level	[edit services aACL rule rule-name term term-name then]
Release Information	Statement introduced in Junos OS Release 11.2.
Description	Enable AACL logging of flows for known or unknown applications.
Options	<p><i>event-type</i>—Enable logging of the specified <i>event-type</i>:</p> <ul style="list-style-type: none"> • session-start • session-end • session-start-end-no-stats • session-start-interim-end • session-interim end • session-end
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • See Configuring Logging of AACL Flows.

match-direction

Syntax	match-direction (input output input-output);
Hierarchy Level	[edit services aACL rule rule-name]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the direction in which the rule match is applied.
Options	<p>input—Apply the rule match on the input side of the interface.</p> <p>output—Apply the rule match on the output side of the interface.</p> <p>input-output—Apply the rule match bidirectionally.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Match Direction for AACL Rules on page 8

rule

Syntax	<pre>rule rule-name { match-direction (input output input-output); term term-name { from { application-group-any; application-groups [application-group-names]; application-unknown; applications [application-names]; destination-address address <any-unicast>; destination-address-range low minimum-value high maximum-value; destination-prefix-list list-name; nested-application-unknown; source-address address <any-unicast>; source-address-range low minimum-value high maximum-value; source-prefix-list list-name; } then { (accept discard); count (application application-group application-group-any nested-application none); forwarding-class class-name; policer policer-name; } } }</pre>
Hierarchy Level	[edit services aacl], [edit services aacl rule-set rule-set-name]
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the rule the router uses when applying this service.
Options	rule-name —Identifier for the collection of terms that constitute this rule. The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring AACL Rules on page 7

rule-set (Services ACL)

Syntax	<code>rule-set <i>rule-set-name</i> { [<i>rule</i> <i>rule-names</i>]; }</code>
Hierarchy Level	[edit services aac]l
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the rule set the router uses when applying this service.
Options	<i>rule-set-name</i> —Identifier for the collection of rules that constitute this rule set.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring ACL Rule Sets on page 11

services (ACL)

Syntax	<code>services aac] { ... }</code>
Hierarchy Level	[edit]
Release Information	<i>aac]l</i> statement introduced in Junos OS Release 9.5.
Description	Define the services to be applied to traffic.
Options	<i>aac]l</i> —The values configured for application-aware-access-list matching rules. The statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Application-Aware Access List

source-address (AACL)

Syntax	<code>source-address <i>address</i>;</code>
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the source address for rule matching.
Options	<i>address</i> —Source IPv4 or IPv6 address or prefix value.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

source-address-range

Syntax	<code>source-address-range low <i>minimum-value</i> high <i>maximum-value</i>;</code>
Hierarchy Level	[edit services aacl rule rule-name term term-name from]
Release Information	Statement introduced in Junos OS Release 9.5. IPv6 support introduced in Junos OS Release 12.2
Description	Specify the source address range for rule matching.
Options	<i>minimum-value</i> —Lower boundary for the IPv4 or IPv6 address range. <i>maximum-value</i> —Upper boundary for the IPv4 or IPv6 address range.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

source-prefix-list

Syntax	<code>source-prefix-list <i>list-name</i>;</code>
Hierarchy Level	<code>[edit services aacl rule <i>rule-name</i> term <i>term-name</i> from]</code>
Release Information	Statement introduced in Junos OS Release 9.5.
Description	Specify the source prefix list for rule matching. You configure the prefix list by including the prefix-list statement at the <code>[edit policy-options]</code> hierarchy level.
Options	<i>list-name</i> —Source prefix list.
Required Privilege Level	<code>interface</code> —To view this statement in the configuration. <code>interface-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Match Conditions in AACL Rules on page 8

term

Syntax `term term-name {`
 `from {`
 `application-group-any;`
 `application-groups [application-group-names];`
 `application-unknown;`
 `applications [application-names];`
 `destination-address address <any-unicast>;`
 `destination-address-range low minimum-value high maximum-value;`
 `destination-prefix-list list-name;`
 `nested-application-unknown;`
 `source-address address <any-unicast>;`
 `source-address-range low minimum-value high maximum-value;`
 `source-prefix-list list-name;`
 `}`
 `then {`
 `(accept | discard);`
 `count (application | application-group | application-group-any | nested-application |`
 `none);`
 `forwarding-class class-name;`
 `policer policer-name;`
 `}`
 `}`

Hierarchy Level `[edit services aacl rule rule-name]`

Release Information Statement introduced in Junos OS Release 9.5.

Description Define the AACL term properties.

Options *term-name*—Identifier for the term.

The remaining statements are explained separately.

Required Privilege Level interface—To view this statement in the configuration.
 interface-control—To add this statement to the configuration.

Related Documentation

- [Configuring AACL Rules on page 7](#)

then

Syntax	<pre> then { (accept discard); count (application application-group application-group-any nested-application none); forwarding-class <i>class-name</i>; log <i>event-type</i>; policer <i>policer-name</i>; } </pre>
Hierarchy Level	[edit services aacl rule <i>rule-name</i> term <i>term-name</i>]
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>policer statement added in Junos OS Release 9.6.</p> <p>The nested-application option for the count statement introduced in Junos OS Release 11.1.</p>
Description	Define the AACL term actions. You can configure the router to accept or discard the targeted traffic. The action modifiers (count and forwarding-class) are optional.
Options	<p>You can configure one of the following actions:</p> <ul style="list-style-type: none"> • accept—Accept the packets and all subsequent packets in flows that match the rules. • discard—Discard the packet and all subsequent packets in flows that match the rules. <p>When you select accept as the action, you can optionally configure one or both of the following action modifiers. No action modifiers are allowed with the discard action.</p> <ul style="list-style-type: none"> • count (application application-group application-group-any nested-application none)—For all accepted packets that match the rules, record a packet count using AACL statistics practices. You can specify one of the following options; there is no default setting: <ul style="list-style-type: none"> • application—Count the application that matched in the from clause. • application-group—Count the application group that matched in the from clause. • application-group-any—Count all application groups that match from application-group-any under the any group name. • nested-application—Count all nested applications that matched in the from clause. • none—Same as not specifying count as an action. • forwarding-class <i>class-name</i>—Specify the packets' forwarding-class name. <p>policer <i>policer-name</i>—Apply rate-limiting properties to the traffic as configured at the [edit firewall policer <i>policer-name</i>] hierarchy level. This configuration allows bit-rate and burst-size attributes to be applied to the traffic that are not supported by AACL rules. When you include a policer, the only allowed action is discard. For more information on policers, see the Routing Policy Configuration Guide.</p>

Required Privilege	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring AACL Rules on page 7• Routing Policy Configuration Guide

PART 3

Administration

- [AACL Operational Mode Commands on page 29](#)

CHAPTER 5

AACL Operational Mode Commands

[clear services application-aware-access-list statistics](#)

Syntax	clear services application-aware-access-list statistics
Release Information	Command introduced in Junos OS Release 9.5.
Description	Clear application aware access list (AACL) statistics.
Options	This command has no options.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show services application-aware-access-list statistics on page 31

show services application-aware-access-list statistics

Syntax	show services application-aware-access-list statistics <interface <i>interface-name</i>> <subscriber <i>subscriber-name</i>>
Release Information	Command introduced in Junos OS Release 9.5.
Description	Display application-aware-access-list (AACL) statistics.
Options	interface <i>interface-name</i> —(Optional) Displays AACL statistics for the specified interface(s) only. subscriber <i>subscriber-name</i> —(Optional) Displays AACL statistics for the specified subscriber(s) only.
Required Privilege Level	view
List of Sample Output	show services application-aware-access-list statistics by interface on page 32 show services application-aware-access-list statistics by subscriber on page 32
Output Fields	Table 3 on page 31 lists the output fields for the show services application-aware-access-list statistics command. Output fields are listed in the approximate order in which they appear.

Table 3: show services application-aware-access-list statistics Output Fields

Field Name	Field Description	Level of Output
Interface	Interface name.	Subscriber option
Subscriber	Subscriber identifier.	Interface option
Service-set-interface	Service set interface name.	All levels
Service set	Service set name.	All levels
Application group	Application group identifier.	All levels
Packets in	Number of ingress packets.	All levels
Bytes in	Number of ingress bytes.	All levels
Packets out	Number of egress packets.	All levels
Bytes out	Number of egress bytes.	All levels

Sample Output

show services
application-aware-access-list
statistics by interface

```
user@host> show services application-aware-access-list statistics interface ge-0/0/0.100
Subscriber: user@juniper.net
```

```
service-set: IDP
service-set interface: ms-2/0/0
```

Application group	Application	Packets in	Bytes in
Packets out	Bytes out		
6	junos:ftp [63] 346	5	334

show services
application-aware-access-list
statistics by subscriber

```
user@host> show services application-aware-access-list statistics subscriber user@juniper.net
Interface: ge-1/1/0.0
```

```
Service-set-interface: ms-1/3/0
Service set: aac1-svc-set
```

Application-aware-access-list statistics

Application group	Packets in	Bytes in	Packets out	Bytes
out				
P2P	16284	400	32025	200
FTP	8700	20000	5231000	100

show services application-aware-access-list flows

Syntax	show services application-aware-access-list flows <interface <i>interface-name</i>> <subscriber <i>subscriber-name</i>>
Release Information	Command introduced in Junos OS Release 10.1. Offload status for flows using Juniper Forwarding Mechanism (JFM) added in Junos OS Release 12.1.
Description	Display application-aware-access-list (AACL) flows. Offloading using JFM is supported only on MX Series routers with Modular Port Concentrators (MPCs).
Options	interface <i>interface-name</i> —Displays AACL flows for the specified interface(s) only. The keyword, <i>interface</i> , must be appended to the command. subscriber <i>subscriber-name</i> —Displays AACL flows for the specified subscriber(s) only. The keyword, <i>subscriber</i> , must be appended to the command.
Required Privilege Level	view
List of Sample Output	show services application-aware-access-list flows by interface on page 35 show services application-aware-access-list flows by subscriber on page 35 show services application-aware-access-list flows by subscriber for offloading using JFM on page 35
Output Fields	Table 4 on page 33 lists the output fields for the show services application-aware-access-list flows command. Output fields are listed in the approximate order in which they appear.

Table 4: show services application-aware-access-list flows Output Fields

Field Name	Field Description	Level of Output
5-tuple	This field comprises five components of the given flow. The components are: <ul style="list-style-type: none"> • Src IP • Dest IP • Src Port • Dest Port • Protocol 	All levels
Application-ID	The identification number associated with the application.	All levels
Dir	The direction in terms of input or output. <ul style="list-style-type: none"> • Input (I) • Output (O) 	All levels

Table 4: show services application-aware-access-list flows Output Fields (*continued*)

Field Name	Field Description	Level of Output
Off	<p>The status of offload to Packet Forwarding Engine. The various options are:</p> <ul style="list-style-type: none"> • Not Offloaded (-) • Policer Offloaded, Flow Not Offloaded (P) • Policer Not Offloaded, Flow Offloaded (F) • Policer and Offloaded (P+F) 	All levels
Off	<p>The status of offload to Packet Forwarding Engine using JFM. The various options are:</p> <ul style="list-style-type: none"> • Not Offloaded (-) • Offload requested but not completed (R) • Offload requested and completed (O) 	All levels
Actions	<p>The types of actions displayed are:</p> <ul style="list-style-type: none"> • discard: (D) • accept : A • accept, count [T]: C-A or C-G or C-T • accept, fwd-class [C]: FC • accept, policer [P]: P • accept, count [T], fwd-class [C]: C-T+FC • accept, count [T], policer [P]: C-T+P • accept, fwd-class [C], policer [P]: FC+P • accept, count[T],fwd-class[C],policer[P]: C-T+FC+P 	All levels

Sample Output

show services
application-aware-access-list
flows by interface

```
user@host>show services application-aware-access-list flows interface ge-1/0/5.0
Interface: ge-1/0/5.0
service-set: aac1-countApps
service-set interface: ms-0/0/0
Currently active flows: 2
High watermark flows: 2
```

5-tuple	Application-ID
Dir Off Action	
-----	-----
1.0.5.2:47072-> 10.10.254.116:80 ,6	junos:http [64]
I - C-T	
10.10.254.116:80 -> 1.0.5.2:47072,6	junos:http [64]
O - C-T	

show services
application-aware-access-list
flows by subscriber

```
user@host>show services application-aware-access-list flows subscriber user@juniper.net
Subscriber: user@juniper.net
```

```
Service-set: ss1
Service-set interface: ms-2/0/0
Currently active flows: 4
High watermark flows: 40
```

5-tuple	Application-ID	Dir Off Action
150.100.100.100:20109->160.200.200.200:80,17	junos:http [64]	I - C-T+FC+P
160.200.200.200:80->150.100.100.100:20109,17	junos:http [64]	O - C-T+FC+P
150.100.100.100:20108->160.100.100.100:80,17	junos:http [64]	I P+F C-T+FC+P
160.100.100.100:80->150.100.100.100:20108,17	junos:http [64]	O P+F C-T+FC+P

show services
application-aware-access-list
flows by subscriber for
offloading using JFM

```
user@host>show services application-aware-access-list flows subscriber user@juniper.net
Subscriber: user@juniper.net
```

```
Service-set: ss1
Service-set interface: ms-2/0/0
Currently active flows: 4
High watermark flows: 40
```

5-tuple	Application-ID	Dir Off Action
150.100.100.100:20109->160.200.200.200:80,17	junos:http [64]	I
- C-T+FC+P		
160.200.200.200:80 ->150.100.100.100:20109,17	junos:http [64]	O
- C-T+FC+P		
150.100.100.100:20108->160.100.100.100:80,17	junos:http [64]	I
R C-T+FC+P		
160.100.100.100:80 ->150.100.100.100:20108,17	junos:http [64]	O
O C-T+FC+P		

PART 4

Index

- [Index on page 39](#)

Index

Symbols

#, comments in configuration statements.....	x
(), in syntax descriptions.....	x
< >, in syntax descriptions.....	x
[], in configuration statements.....	x
{ }, in configuration statements.....	x
(pipe), in syntax descriptions.....	x

A

AACL	
action statements.....	10
applications.....	8
example configuration.....	13
logging flows.....	11
match conditions.....	8
rules.....	11
statistics	
clearing.....	30
application-aware-access-list See aacl	
application-group-any statement.....	16
AACL	
usage guidelines.....	8
application-groups statement.....	15
AACL	
usage guidelines.....	8
applications statement	
AACL.....	15
usage guidelines.....	8

B

braces, in configuration statements.....	x
brackets	
angle, in syntax descriptions.....	x
square, in configuration statements.....	x

C

clear services application-aware-access-list	
statistics command.....	30
command-name command.....	33
comments, in configuration statements.....	x

conventions	
text and syntax.....	ix
curly braces, in configuration statements.....	x
customer support.....	xi
contacting JTAC.....	xi

D

destination-address statement	
AACL.....	16
usage guidelines.....	8
destination-address-range statement	
AACL.....	17
usage guidelines.....	8
destination-prefix-list statement	
AACL.....	17
usage guidelines.....	8
documentation	
comments on.....	xi

F

flows	
access-list.....	33
list-flows.....	33
font conventions.....	ix
from statement	
AACL.....	18
usage guidelines.....	7

L

list-flows.....	33
See also list-statistics	

M

manuals	
comments on.....	xi
match-direction statement	
AACL.....	19
usage guidelines.....	8

P

parentheses, in syntax descriptions.....	x
--	---

R

rule statement	
AACL.....	20
usage guidelines.....	7
rule-set statement	
AACL.....	21
usage guidelines.....	11

S

show services application-aware-access-list	
statistics command.....	31
source-address statement	
AACL.....	22
usage guidelines.....	8
source-address-range statement	
AACL.....	22
usage guidelines.....	8
source-prefix-list statement	
AACL.....	23
usage guidelines.....	8
statistics	
AACL	
clearing.....	30
support, technical See technical support	
syntax conventions.....	ix

T

technical support	
contacting JTAC.....	xi
term statement	
AACL.....	24
usage guidelines.....	7
then statement	
AACL.....	25
usage guidelines.....	7