

Junos® OS

Application Aware Services Interfaces User Guide for Routing Devices

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About This Guide

Use this guide to configure and monitor the identification of applications being used in TCP, UDP, and ICMP traffic, and to filter traffic based on the application type. Starting with Junos OS Release 16.1R1, the features described in this guide are no longer supported. See the [Broadband Subscriber Services User Guide](#) for information about the new application identification features.

1

CHAPTER

Configuring Stateless, Rule-Based Services Using Application-Aware Access Lists

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AACL Overview

NOTE: Starting with Junos OS Release 12.1, all interface-style services are supported for dynamic Point-to-Point Protocol over Ethernet (PPPoE) subscribers on all MX Series routers with modular Modular Port Concentrators (MPCs).

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 Services Interfaces User Guide for Routing Devices](#). For more information on the operational command, see the [CLI Explorer](#).

NOTE: Because the Junos OS extension-provider package framework lacks aggressive constraint checks, you should not set the `policy-db-size` statement at the `[edit chassis fpc slot-number pic pic-number adaptive-services service-package extension-provider]` hierarchy level to a high value. For Junos Application Aware (previously known as dynamic application awareness) configurations, the recommended values for the extension-provider options at this hierarchy level are as follows:

- `control-cores = 1`
- `data-cores = 7`
- `object-cache-size = 1280` (for Multiservices 400 PIC and Multiservices DPC)
- `policy-db-size = 200`

- Include these package values: jservices-idp, jservices-appid, jservices-llpdf, jservices-aac1

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Best-Effort Application Identification of DPI-Serviced Flows

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Features That Support Application-Level Filtering

The application-aware access list (AACL) service uses application names and groups as matching criteria for filtering traffic. The service defines the applications and application groups for which statistics are collected for a specific user or interface.

The local policy decision function (L-PDF) enables you to configure properties for statistics output. L-PDF supports a process that regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

Best-Effort Application Determination

Typically, APPID conclusively determines the Layer 7 application associated with a given DPI-serviced flow. In these cases, the application identification is final. Occasionally, APPID is only able to make an initial, inconclusive determination of the Layer 7 application associated with a given flow. This is referred to as a *best-effort* application identification. In such cases, the APPID process continues processing packets on that flow and might subsequently make a conclusive determination of the application associated with that flow. In some cases of best-effort application identification, the flow ends before a final application determination can be made.

APPID, AACL, and L-PDF Processing in Preconvergence Scenarios

The following sections describe APPID, AACL, and L-PDF processing in various stages of application identification for a DPI-serviced flow of TCP/UDP/ICMP traffic.

Prior to a Final or Best-Effort Application Identification

During the time that APPID has not yet made either a final or best-effort determination of the application associated with a given flow, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has not yet made either a final or best-effort determination of the associated application:

- `show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)`
- `show services application-aware-access-list flows (interface interface-name | subscriber subscriber-name)`

In the command output, the Action field displays `accept` and the Application or Application group field displays `unknown` for a flow for which APPID has not yet made either a final or best-effort determination of the associated application.

Upon Best-Effort Application Identification

When a best-effort application determination is made, AACL does not apply any AACL term actions configured for that flow. There are a number of reasons for this, one being that the action itself (such as `discard`) can make a final application determination impossible. Instead, AACL or L-PDF tracks the flow and accepts all packets for that flow until a final determination is made, at which time the normal AACL or L-PDFL actions are fully applied to the flow.

While Application Identification Is on a Best-Effort Basis

During the time that APPID identification of the application associated with a given flow is on a best-effort basis, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has only made a best-effort determination of the associated application:

- `show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)`
- `show services application-aware-access-list flows (interface interface-name | subscriber subscriber-name)`

In the command output, the Action field displays `accept` and the Application or Application group field displays `unknown` for a flow for which APPID has only made a best-effort determination of the associated application.

If a Flow Ends Before an Application Identification Is Made

If a flow ends before APPID has made either a final or a best-effort application identification, AACL or L-PDF uses the `unknown` application ID as a final determination and performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the `count AACL` term action is configured for the `application-group-any` application, then the statistics for that flow are collected and aggregated against the `count` bucket type, and reported as such.

If a Flow Ends While Application Identification on a Best-Effort Basis

If a flow ends while the application identification is on a best-effort basis, AACL or L-PDF uses that best-effort determination as a final determination. AACL or L-PDF performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the `count AACL` term action is configured for that Layer 7 application, then the statistics for the flow are collected and aggregated against the AACL or L-PDF statistics. However, in the case of nested applications, AACL and L-PDF do not consider the best-effort determination as final and the nested application is reported as an `unknown` application.

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Configuring AACL Rules

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- [Configuring Actions in AACL Rules | 9](#)
- [Logging AACL Flows Based on Application | 10](#)

To configure an AACL rule, include the rule *rule-name* statement at the [edit services aac1] 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 AACL rules:

Configuring Match Direction for AACL 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 aacl 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 AACL Rules

To configure AACL match conditions, include the `from` statement at the `[edit services aacl 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 Policies, Firewall Filters, and Traffic Policers User 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 AACL rule. For an example, see ["Example: Configuring AACL Rules" on page 12](#).

If you omit the `from` term, the AACL 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 ["APPID Overview" on page 17](#).

- 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 is junos:http:facebook.

Configuring Actions in AACL Rules

To configure AACL 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 AACL 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 AACL does not get the nested application information. In such cases, nested applications are 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" on page 3](#).

- `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 Policies, Firewall Filters, and Traffic Policers User 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

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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;
    }
  }
}
```

```
}
}
```

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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.

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Configuring Logging of AACL Flows

You can configure logging of AACL flows for a given application or for all unknown applications using AACL rules. You must set match-direction to input or input-output for logging to occur.

1. Create a rule and term.

```
user@host# edit services aacl rule rule-name term term-name
```

2. Specify selection of an application.

```
[edit services aacl rule rule-name term term-name]
user@host# set from applications application-name
```

OR

Specify selection of all unknown applications.

```
[edit services aacl rule <variable>rule-name</variable> term <variable>term-name</variable>]
set from application-unknown
```

3. In the then statement, specify logging of input flow.

```
[edit services aacl rule rule-name term term-name]
user@host# set then log input-flows]
```

Example—Configuration of Logging of Input Flows for Unknown Applications

```
[edit services aacl rule aacl_rule5]
match-direction input-output;
term t0 {
  from {
    application-unknown;
  }
  then {
    count application;
    log input-flow;
    accept;
```

```
}  
}
```

Example—Setup of a Specific Log File

The following example shows how to direct the aac1 flow log to a file other than the default syslog file on the Routing Engine file system.

```
[edit system syslog]  
file aac1_log {  
    external any;  
    match aac1-flow-log;  
}
```

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APPID Overview

NOTE: Starting with Junos OS Release 12.1, all interface-style services are supported for dynamic Point-to-Point Protocol over Ethernet (PPPoE) subscribers on all MX Series routers with modular Modular Port Concentrators (MPCs).

The APPID feature identifies applications as constituents of application groups in TCP/UDP/ICMP traffic. It is supported on MX Series routers equipped with Multiservices DPCs and on M120 or M320 routers equipped with Multiservices 400 PICs and Aggregated Multiservices (AMS) PICs. Aggregated Multiservices PICs (ams- interfaces) enable multiple ms- interfaces to be grouped together in a single bundle and cause the traffic destined for this AMS group to be distributed over the member services PICs of the group. Junos OS Trio chipsets enable the calculation of a symmetric hash for the forward and reverse flows, and support a microcode map in the forwarding plane. This capability enables load-balancing of traffic across various services PICs in an AMS group. Starting with Junos OS Release 12.1, ams- interfaces enable an N:1 redundancy mechanism to cluster together N number of ms- interfaces in an AMS group that supports load sharing.

NOTE: For ams- interfaces and rms- interfaces, the statistics data in the bulk statistics file is collected using the reports received from the MS PICs. For the ams- interfaces, the retrieval and storage of statistics is not possible because of multiple PICs containing statistics data for the same subscriber. For interfaces in an AMS group, statistics data from different MS PICs in the AMS group are collected and aggregated on the Routing Engine where a timer control is activated and the data is saved in the bulkstats file based on this timer. This method of collection causes the statistics data in the bulkstats file to be displayed with a small delay period.

To configure APPID, include statements at the [edit services application-identification] hierarchy level to specify parameter values for defining applications, enable or disable application rules, and gather the applications and rules into groups.

The following are related operational commands:

- `show/clear application-identification application-system-cache`
- `show/clear application-identification counters`

For more information on the CLI configuration, see the ["Configuring APPID Rules" on page 24](#). For more information on the operational commands, see the [CLI Explorer](#).

NOTE: Because the extension-provider package framework lacks aggressive constraint checks, you should not set the `policy-db-size` statement at the `[edit chassis fpc slot-number pic pic-number adaptive-services service-package extension-provider]` hierarchy level to a high value. For Junos Application Aware (previously known as Dynamic Application Awareness) configurations, the recommended values for the extension-provider package options at this hierarchy level are as follows:

- `control-cores = 1`
- `data-cores = 7`
- `object-cache-size = 1280` (for Multiservices 400 PIC and Multiservices DPC)
- `policy-db-size = 200`
- Include these package values: `jservices-idp`, `jservices-appid`, `jservices-llpdf`, `jservices-aac1`

NOTE: In the export version of Junos OS, signature download is not expected to work for the AppID feature in Junos Application Aware. In order to make it work, you must additionally install the Crypto Software Suite.

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Best-Effort Application Identification of DPI-Serviced Flows

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- [Best-Effort Application Determination | 19](#)
- [APPID, AACL, and L-PDF Processing in Preconvergence Scenarios | 20](#)

Features That Support Application-Level Filtering

The application-aware access list (AACL) service uses application names and groups as matching criteria for filtering traffic. The service defines the applications and application groups for which statistics are collected for a specific user or interface.

The local policy decision function (L-PDF) enables you to configure properties for statistics output. L-PDF supports a process that regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

Best-Effort Application Determination

Typically, APPID conclusively determines the Layer 7 application associated with a given DPI-serviced flow. In these cases, the application identification is final. Occasionally, APPID is only able to make an initial, inconclusive determination of the Layer 7 application associated with a given flow. This is referred to as a *best-effort* application identification. In such cases, the APPID process continues processing packets on that flow and might subsequently make a conclusive determination of the application associated with that flow. In some cases of best-effort application identification, the flow ends before a final application determination can be made.

APPID, AACL, and L-PDF Processing in Preconvergence Scenarios

The following sections describe APPID, AACL, and L-PDF processing in various stages of application identification for a DPI-serviced flow of TCP/UDP/ICMP traffic.

Prior to a Final or Best-Effort Application Identification

During the time that APPID has not yet made either a final or best-effort determination of the application associated with a given flow, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has not yet made either a final or best-effort determination of the associated application:

- `show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)`
- `show services application-aware-access-list flows (interface interface-name | subscriber subscriber-name)`

In the command output, the Action field displays `accept` and the Application or Application group field displays `unknown` for a flow for which APPID has not yet made either a final or best-effort determination of the associated application.

Upon Best-Effort Application Identification

When a best-effort application determination is made, AACL does not apply any AACL term actions configured for that flow. There are a number of reasons for this, one being that the action itself (such as `discard`) can make a final application determination impossible. Instead, AACL or L-PDF tracks the flow and accepts all packets for that flow until a final determination is made, at which time the normal AACL or L-PDF actions are fully applied to the flow.

While Application Identification Is on a Best-Effort Basis

During the time that APPID identification of the application associated with a given flow is on a best-effort basis, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has only made a best-effort determination of the associated application:

- `show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)`
- `show services application-aware-access-list flows (interface interface-name | subscriber subscriber-name)`

In the command output, the Action field displays accept and the Application or Application group field displays unknown for a flow for which APPID has only made a best-effort determination of the associated application.

If a Flow Ends Before an Application Identification Is Made

If a flow ends before APPID has made either a final or a best-effort application identification, AACL or L-PDF uses the unknown application ID as a final determination and performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the count AACL term action is configured for the application-group-any application, then the statistics for that flow are collected and aggregated against the count bucket type, and reported as such.

If a Flow Ends While Application Identification on a Best-Effort Basis

If a flow ends while the application identification is on a best-effort basis, AACL or L-PDF uses that best-effort determination as a final determination. AACL or L-PDF performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the count AACL term action is configured for that Layer 7 application, then the statistics for the flow are collected and aggregated against the AACL or L-PDF statistics. However, in the case of nested applications, AACL and L-PDF do not consider the best-effort determination as final and the nested application is reported as an unknown application.

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Defining an Application Identification

To configure a specific IP address or port-based application identification, include the application *application-name* statement at the [edit services application-identification] hierarchy level:

```
application application-name {
  disable;
  idle-timeout seconds;
  index number;
  session-timeout seconds;
  type type;
  type-of-service service-type;
  port-mapping {
    port-range {
      tcp [ ports-and-port-ranges ];
      udp [ ports-and-port-ranges ];
    }
    disable;
  }
}
```

You can include the following general properties in the configuration:

- **application**—Application name, a required statement; maximum 31 characters. Predefined applications have the prefix *junos-* to avoid conflict with user-defined ones.
- **idle-timeout**—Amount of time that a session remains idle before it is deleted.
- **index**—Application index number in the range from 1 through 65,534, with integers 1 through 1024 reserved for predefined applications.
- **session-timeout**—Lifetime of a session.
- **type**—Well known applications, such as HTTP or FTP.
- **type-of-service**—Type of service, defined by service objective. There is no default value; options are *maximize-reliability*, *maximize-throughput*, *minimize-delay*, and *minimize-monetary-cost*.
- **disable**—Disable this application definition in the APPID service.

NOTE: You can also specify session and idle timeout values globally for a Multiservices interface by including the following statements at the [edit interfaces *interface-name* services-options] hierarchy level:

- `inactivity-non-tcp-timeout`—Inactivity timeout period for non-TCP established sessions.
- `inactivity-tcp-timeout`—Inactivity timeout period for TCP established sessions.
- `session-timeout`—Lifetime of a session.
- `disable-global-timeout-override`—Disallow overriding a global inactivity or session timeout.

You can include the following port-mapping properties at the [edit services application-identification port-mapping] hierarchy level:

- `port-range`—TCP or UDP port number or numeric range, entered as [*minimum-value* - *maximum-value*]. For port-mapping configurations, this entry is required if the parent node exists.
- `disable`—Disable port-mapping properties for this application.

NOTE: For applications with signatures for both client-to-server and server-to-client directions, the APPID for Junos Application Aware (previously known as Dynamic Application Awareness) must accept the data packets in both directions on the same session to complete the identification process.

For a configuration example, see ["Examples: Configuring Application Identification Properties" on page 41](#).

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Configuring APPID Rules

This configuration specifies the properties for identifying an application for which a source or destination IP address and port is used for a known application, without the requirement of an application signature. For example, the Session Initiation Protocol (SIP) server initiates a session from its identified port, 5060. You can therefore specify the SIP server IP address and port 5060 in the port mapping configuration for the SIP application. The advantage of using this method is to provide efficiency and accuracy of application identification for your network.

To configure application rule properties, include the rule statement at the [edit services application-identification] hierarchy level:

```
rule rule-name {
  address address-name {
    destination {
      ip address</prefix-length>;
      port-range {
        tcp [ ports-and-port-ranges ];
        udp [ ports-and-port-ranges ];
      }
    }
    source {
      ip address</prefix-length>;
      port-range {
        tcp [ ports-and-port-ranges ];
        udp [ ports-and-port-ranges ];
      }
    }
    order number;
  }
  application application-name;
  disable;
}
```

You can include the following application rule properties:

- address—Address properties for APPID rule processing. This statement is mandatory; you must specify either destination or source properties.

- **destination**—Destination address and port information. The `ip` statement defines the IP address and netmask (IPv4 only), and the `port-range` statement defines the TCP or UDP port number or numeric range, entered as `[minimum-value - maximum-value]`.
- **source**—Source address and port information. The `ip` statement defines the IP address and netmask (IPv4 only), and the `port-range` statement defines the TCP or UDP port number or numeric range, entered as `[minimum-value - maximum-value]`.
- **order**—Application matching priority. For address configurations, the order number resolves the conflict when multiple address entries are matched for a specific session; the lower the number, the higher the priority. This statement is mandatory and must contain a unique value.
- **application**—Name of the application to be included in the rule.
- **disable**—Disable processing for this application rule.

The `rule-set` statement defines a collection of APPID 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 application-identification]` hierarchy level with a rule statement for each rule:

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

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Using Stateful Firewall Rules to Identify Data Sessions

The APPID configuration properties enable the Junos OS to detect applications based on signatures, ports, and addresses. For signature-based detection, most of the protocol control sessions are identified, but data sessions are not identified. For example, APPID identifies FTP connections to port 21 (FTP control sessions); however, FTP can open child/data sessions to transfer files and data. These sessions are not identified by signature-based APPID because they do not have well-defined signatures.

Application-level gateways (ALGs) configured using stateful firewall rules can assist APPID in identifying these data sessions. These sessions include file and video transfers that are heavy consumers of bandwidth, so a mechanism for policing and classifying this traffic effectively is a useful tool. In addition to FTP, this mechanism applies to TFTP and RTSP traffic.

To incorporate the stateful firewall rules into Junos Application Aware (previously known as Dynamic Application Awareness for Junos OS) sessions, include the following configurations:

1. Include the stateful firewall package at the [edit chassis fpc *slot-number* pic *pic-number* adaptive-services service-package extension-provider] hierarchy level:

```
package jservices-sfw;
```

2. Define two stateful firewall rules as shown in the following example, one to identify the appropriate ALGs for FTP, TFTP, or RTSP traffic and the other to allow all traffic:

NOTE: Session Initiation Protocol (SIP) is already covered by APPID and the SIP ALG is not supported by stateful firewall, hence a SIP configuration is not needed.

```
[edit services]
stateful-firewall {
  rule rule1 {
    match-direction input-output;
    term term1 {
      from {
        applications [ junos-ftp junos-tftp junos-rtsp ];
      }
      then {
        accept;
```

```

    }
  }
}
rule rule2 {
  match-direction input-output;
  term term1 {
    then {
      accept;
    }
  }
}

rule-set rs1 {
  rule rule1;
  rule rule2;
}
}

```

NOTE: The existing AACL and L-PDF operational mode commands should report the new applications when they are identified.

3. Attach the stateful firewall rule set to a service set, as shown in the following example:

```

service-set test-chaining {
  application-identification-profile add-based;
  stateful-firewall-rule-sets rs1;
  idp-profile idp1;
  aacl-rules rule1;
  interface-service {
    service-interface ms-2/0/0.0;
  }
}

```

4. Include *no-drop* settings for stateful firewall and TCP, as needed.

Stateful firewall processing drops packets in a number of scenarios:

- TCP sessions do not start with a SYN flag. (This prevents sessions from resuming; otherwise, when the PIC starts for the first time, all existing TCP sessions in flight are dropped).
- If the TCP tracker detects SYN but no SYN/ACK or only an ACK, then the ACK is dropped. There are a number of similar checks to verify the TCP connection, window checks, and so forth.

- TCP checks for stateful firewall are aggressive when ALGs are run. It is not possible to ignore TCP errors when an ALG is run on a session.
- If an ALG detects malformed packets (for example, if the FTP PORT command is not RFC-compliant), it drops packets. If an ALG is not able to allocate resources, it drops packets.

You can include the settings shown in the following example to assist in controlling these packet drops:

```
[edit interfaces]
ms-1/2/0 {
  services-options {
    ignore-errors {
      tcp;
      alg;
    }
  }
}
```

The `tcp` statement mediates the first two issues listed, with reference to TCP SYN detection. The `alg` statement handles the fourth issue. ALGs require strict TCP processing, which cannot be relaxed.

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Configuring Application Profiles

You can define an application profile for use in a service set. The profile consists of one or more rule sets, but only one profile can be included per service set.

To specify the application profile constituents, include the profile statement at the [edit services application-identification] hierarchy level:

```
profile profile-name {
  [ rule-set rule-set-name ];
}
```

You assign a profile name and include one or more predefined rule sets. For more information on rule sets, see ["Configuring APPID Rules" on page 24](#). You can then include the profile in a service-set definition:

```
[edit services]
service-set service-set-name {
  profile profile-name;
}
```

The definitions specific to Junos Application Aware (previously known as Dynamic Application Awareness) include the APPID profile and the AACL rule set. For more information on service sets, see *Understanding Service Sets*.

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Configuring Application Groups

You can define an application group to process a number of applications or subgroups at the same time. To configure application group properties, include the application-group statement at the [edit services application-identification] hierarchy level:

```
application-group group-name {
  application-groups {
    application-group-name;
  }
}
```

```

    }
    applications {
        application-name;
    }
    index number;
    disable;
}

```

You can include the following application group properties:

- **applications**—List of applications to include in this application group. The `name` statement is mandatory and must include at least one entry.
- **application-groups**—List of application groups to include in a larger application group. The `name` statement is mandatory and must include at least one entry.
- **index**—Application group index number in the range from 1 through 65,534. This mandatory value must be unique.
- **disable**—Disable processing for this application group.

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Application Identification for Nested Applications

Nested applications are protocols running over the parent application. For example, both Facebook and Yahoo Messenger can run over HTTP, but there is a need to identify them as two different applications. To do this, the application layer is split into two layers: Layer 7 applications and Layer 7 protocols.

The predefined application signatures included with Junos OS have been created to detect the Layer 7 nested applications. Predefined application signatures can be used in attack objects.

To configure nested application properties, include the nested-application statement at the [edit services application-identification] hierarchy level:

```
nested-application name {
  index number;
  protocol protocol;
  signature name {
    chain-order ;
    maximum-transactions number;
    member name {
      context (http-header-content-type | http-header-host | http-url-parsed | http-url-
parsed-param-parsed);
      direction (any | client-to-server | server-to-client);
      pattern dfa-pattern;
    }
    order number;
  }
  type type;
}
```

You can include the following application rule properties:

- **chain-order**—Signatures can contain multiple members. If the chain order feature is on, those members are read in order. The default for this option is no chain order. If a signature contains only one member, this option is ignored.
- **context**—Define a service specific context. The options are `http-header-content-type` , `http-header-host` , `http-url-parsed`, `http-url-parsed-param-parsed`. This statement is mandatory.
- **direction**—The connection direction of the packets to apply pattern matching. The options are `client-to-server`, `server-to-client`, or `any`. This statement is mandatory.
- **index**—A number that is a one-to-one mapping to the application name that is used to ensure that each signature definition is unique. The index range for predefined applications is 1 through 32767. The index range for custom applications and custom nested applications is 32768 through 65534.
- **maximum transactions**—The maximum number of transactions that should occur before a match is made. This statement is mandatory.
- **member**—Define a member name for a custom nested application signature definition. Custom definitions can contain multiple members that define attributes for an application.

- **order**—Define application matching priority. For address configurations, the order number resolves the conflict when multiple address entries are matched for a specific session. The lower number has higher priority. This statement is mandatory.
- **pattern**—Define an attack pattern to be detected. This statement is mandatory.
- **protocol**—The protocol that is monitored to identify nested applications. The value `http` is supported. This statement is mandatory.
- **signature**—Name of the custom nested application signature definition. Must be a unique name with a maximum length of 32 characters. This statement is mandatory.
- **type**—Well-known application name for this application definition, such as Facebook or Kazza. This application name must be unique with a maximum length of 32 characters. This statement is mandatory.

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Disabling Application Identification for Nested Applications

Sometimes there is a need to identify multiple different applications running on the same Layer 7 protocols. For example, both Facebook and Yahoo Messenger can run over HTTP, but there is a need to identify them as two different applications. To do this, the application layer is split into two layers: Layer 7 applications and Layer 7 protocols. Application identification for nested applications is turned on by default. You can manually turn it off by using the CLI.

The `nested-applications-settings` and `no-nested-application` statements are deprecated in Junos OS Release 12.3X48-D10 and later.

To disable nested application identification:

- Set the `no-nested-application` statement.

```
[edit services application-identification nested-application-settings]
user@host# no-nested-application
```

To verify the configuration, issue the `show services application-identification nested-application-settings` command.

To reenable nested application identification:

- Delete the `no-nested-application` statement.

```
[edit services application-identification nested-application-settings]
user@host# delete services application-identification nested-application-settings no-nested-application
```

If you are finished configuring the device, commit the configuration.

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Configuring Global APPID Properties

You can define additional properties that apply on a global basis to APPID processing and are not part of a specific application, group, rule, or profile definition. To configure these global APPID properties, include the following statements at the `[edit services application-identification]` hierarchy level:

```
application-identification {
  application-system-cache-timeout seconds;
  max-checked-bytes bytes;
  min-checked-bytes bytes;
  nested-application name;
  nested-application-settings;
  no-application-identification;
  no-application-system-cache;
```

```

no-clear-application-system-cache;
no-protocol-method;
no-signature-based;
signature-method-all-ports;
}

```

The global application properties have the following effect:

- `application-system-cache-timeout`—Lifetime for system cache entries, in seconds.
- `max-checked-bytes`—The maximum number of bytes to be inspected in APPID processing, in the range from 0 through 100,000 bytes.
- `min-checked-bytes`—The minimum number of bytes to be inspected in APPID processing, in the range from 0 through 2000 bytes.
- `nested-application`—Configure a custom nested application definition for the desired application name that is used by the system to identify the nested application as it passes through the device. For more information see ["nested-application" on page 131](#).
- `nested-application-settings`—Configure nested application options for application identification services. This statement is deprecated in Junos OS Release 12.3X48-D10 and later. For more information see ["nested-application-settings" on page 134](#).
- `no-application-identification`—Disable all application identification methods.
- `no-application-system-cache`—Disable storing application identification results in the application system cache.
- `no-clear-application-system-cache`—Disable clearing the application system cache.
- `no-protocol-method`—Disable the protocol-based application identification method, which is enabled by default.
- `no-signature-based`—Disable the signature-based application identification method.
- `signature-method-all-ports`—Run signature matching on all traffic.

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Configuring APPID Support for Heuristics

Heuristics methodology provides a mechanism for identifying encrypted data packets in point-to-point applications. These packets are not normally detected by the existing application signatures. The `enable-heuristics` statement is deprecated in Junos OS Release 12.3X48-D10 and later.

To enable APPID to employ heuristics in traffic identification:

Include the `enable-heuristics` statement:

```
[edit services application-identification]
user@host# set enable-heuristics
```

The `show services application-identification counter operational` command includes additional output fields that report the number of encrypted sessions.

NOTE: When you enable heuristics, performance and scaling values might be negatively affected. This mechanism assists the APPID module in identifying encrypted traffic, but only if the identifications are supported by the current signature package.

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Configuring APPID Support for Unidirectional Traffic

With asymmetrical routing, a networking device sees only one side of the network sessions, either from client to server or from server to client. Additional functionality is required to support application identification with unidirectional traffic. This addition enables a session for a specified service set to support an asymmetrical routing environment, and allows complete application matches using existing application signatures for traffic in the client-to-server direction only.

To enable APPID to support application matching on unidirectional traffic:

1. Include the `support-uni-directional-traffic` statement:

```
[edit services service-set service-set-name service-set-options]  
user@host# set support-uni-directional-traffic
```

This enables the session belonging to the specified service set to support the asymmetrical routing environment. The APPID module then reports complete matches for the unidirectional traffic.

2. Include the `enable-asymmetric-traffic-processing` statement:

```
[edit services service-set service-set-name service-set-options]  
user@host# set enable-asymmetric-traffic-processing
```

This enables the framework and plug-in to handle unidirectional traffic at a service-set level.

When you enable these settings, APPID treats unidirectional TCP traffic like a UDP connection. UDP traffic itself does not receive any special treatment because the service PIC cannot determine whether UDP traffic is unidirectional or bidirectional. The settings do not affect processing of sessions created with bidirectional traffic.

If the traffic includes both unidirectional and bidirectional sessions, the APPID module uses heuristics to decide whether to change the reporting logic.

NOTE: This feature does not change the processing for any services except APPID. However, other services, including stateful firewall and AACL, can process unidirectional traffic in a limited manner.

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Configuring Automatic Download of Application Package Updates

You can set up automatic downloading of application package updates. To configure downloads, include the download statement at the [edit services application-identification] hierarchy level:

```
download {  
  automatic {  
    interval hour;  
    start-time time;  
  }  
  url url;  
}
```

You can include the following download statements:

- **download**—Define download properties.
- **automatic**—Set start-time value and interval in hours for automatic downloads. The default start-time is 0:00 and the range is from 0:00 through 24:00. The default interval is 24 and the range is from 6 through 720.
- **url**—Specify the download URL.

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Tracing APPID Operations

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Tracing operations track all adaptive services operations and record them in a log file. The logged error descriptions provide detailed information to help you solve problems faster.

By default, no events are traced. If you include the `traceoptions` statement at the `[edit services application-identification]` hierarchy level, the default tracing behavior is as follows:

- Important events are logged in a file called `serviced` located in the `/var/log` directory.
- When the file `serviced` reaches 128 kilobytes (KB), it is renamed `serviced.0`, then `serviced.1`, and so on, until there are three trace files. Then the oldest trace file (`serviced.2`) is overwritten. (For more information about how log files are created, see the [System Log Explorer](#).)
- Only the user who configures the tracing operation can access the log files.
- To display the end of the log, issue the `show log serviced | last` operational mode command:

```
[edit]
user@host# run show log serviced | last
```

You cannot change the directory (**/var/log**) in which trace files are located. However, you can customize the other trace file settings by including the following statements:

```
file filename <files number> <match regex> <size size> <(world-readable | no-world-readable)>;
flag {
    all;
}
```

You configure these statements at the [edit services application-identification traceoptions] hierarchy level.

These statements are described in the following sections:

Configuring the APPID Log Filename

By default, the name of the file that records trace output is *serviced*. You can specify a different name by including the file statement at the [edit services application-identification traceoptions] hierarchy level:

```
file filename;
```

Configuring the Number and Size of APPID Log Files

By default, when the trace file reaches 128 kilobytes (KB) in size, it is renamed *filename.0*, then *filename.1*, and so on, until there are three trace files. Then the oldest trace file (*filename.2*) is overwritten.

You can configure the limits on the number and size of trace files by including the following statements at the [edit services application-identification traceoptions] hierarchy level:

```
file files number size size;
```

For example, set the maximum file size to 2 MB, and the maximum number of files to 20. When the file that receives the output of the tracing operation (*filename*) reaches 2 MB, *filename* is renamed *filename.0*, and a new file called *filename* is created. When the new *filename* reaches 2 MB, *filename.0* is renamed *filename.1* and *filename* is renamed *filename.0*. This process repeats until there are 20 trace files. Then the oldest file (*filename.19*) is overwritten by the newest file (*filename.0*).

The number of files can be from 2 through 1000 files. The file size of each file can be from 10 KB through 1 gigabyte (GB).

Configuring Access to the Log File

By default, only the user who configures the tracing operation can access log files.

To specify that any user can read all log files, include the `file world-readable` statement at the `[edit services application-identification traceoptions]` hierarchy level:

```
file world-readable;
```

To explicitly set the default behavior, include the `file no-world-readable` statement at the `[edit services application-identification traceoptions]` hierarchy level:

```
file no-world-readable;
```

Configuring a Regular Expression for Lines to Be Logged

By default, the trace operation output includes all lines relevant to the logged events.

You can refine the output by including the `match` statement at the `[edit services application-identification traceoptions file filename]` hierarchy level and specifying a regular expression (regex) to be matched:

```
file filename match regex;
```

Configuring the Tracing Flags

By default, if the `traceoptions` configuration is present, only important events are logged. You can configure the trace operations to be logged by including the following statements at the `[edit services application-identification traceoptions]` hierarchy level:

```
flag {  
    all;  
}
```

Currently, the only supported flag is `all`, which instructs the router to trace all operations.

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[Defining an Application Identification | 22](#)

[Examples: Configuring Application Identification Properties | 41](#)

Examples: Configuring Application Identification Properties

The following examples show an address-based application identification configuration:

```
[edit services application-identification]
rule rule1 {
  application-name test2;
  address 1 {
    source {
      ip 10.110.1.1/16;
      port-range {
        tcp 1110-1150;
      }
    }
    destination {
      ip 10.11.1.1/16;
      port-range {
        tcp 111-1100;
      }
    }
    order 1;
  }
}
```

```
[edit services application-identification]
rule-set rs1 {
  rule rule1;
}
```

```

profile pf1 {
    rule-set rs1;
}

[edit services]
service-set sset1 {
    application-identification-profile pf1;
}

```

The following examples show application group configuration:

```

[edit services application-identification]
application-group junos:peer-to-peer {
    index 5;
    application-groups {
        junos:chat;
        junos:file-sharing;
        junos:voip;
    }
}

```

```

[edit services application-identification]
application-group junos:voip {
    index 14;
    applications {
        junos:h225ras;
        junos:h225sgn;
        junos:mgcp;
        junos:sip;
    }
}

```

The following examples show application identification for nested application configuration:

```

nested-application nested1 {
    type nested1;
    index 65345;
    protocol HTTP;
    signature nestedcust001 {
        member m01 {

```

```
        context http-url-parsed;  
        pattern .*nested.*;  
        direction any;  
    }  
    maximum-transactions 2;  
order 3825;
```

3

CHAPTER

Collecting Statistics and Tracking Data Using L-PDF

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L-PDF Overview

NOTE: Starting with Junos OS Release 16.1R1, the local policy decision function is not supported.

NOTE: Starting with Junos OS Release 12.1, all interface-style services are supported for dynamic Point-to-Point Protocol over Ethernet (PPPoE) subscribers on all MX Series routers with modular Modular Port Concentrators (MPCs).

Starting with Junos OS Release 12.1, the local policy decision function (L-PDF) plug-in can offload flows to the Packet Forwarding Engine. Offloading is supported only on MX Series routers with Modular Port Concentrators (MPCs) and accomplished using the Juniper Forwarding Mechanism (JFM). JFM allows services flows to be offloaded to the Packet Forwarding Engine. However, 5-tuple flows cannot be offloaded. Apart from the local L-PDF plug-in, offloading is supported on the packet-triggered subscribers and policy control (PTSP) plug-in. The `show services application-aware-access-list flows subscriber subscriber-name` command displays offload status.

Local policy decision functionality for application-related services adds support for a new process that regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces. This functionality is collectively named the local policy decision function (L-PDF). L-PDF is supported on:

- MX Series routers equipped with Multiservices DPCs.
- M120 or M320 routers equipped with Multiservices 400 PICs.
- Aggregated Multiservices (AMS) PICs.

Multiple `ms-` interfaces can be bundled together in an AMS PIC interface, which causes the traffic destined for this AMS group to be distributed over the member services PICs of the group. Junos OS Trio chipsets enable the calculation of a symmetric hash for the forward and reverse flows, and support a microcode map in the forwarding plane. This capability enables load-balancing of traffic across various services PICs in an AMS group. Starting with Junos OS Release 12.1, `ams-` interfaces enable an N:1 redundancy mechanism to cluster together N number of `ms-` interfaces in an AMS group that supports load sharing.

Starting with Junos OS Release 11.3, local L-PDF that resides on the services PIC is supported on T320, T640, and T1600 routers. The application identification (APPID) service defines the applications and how they are grouped. The application-aware access list (AACL) service defines the applications and

application groups for which statistics are collected for a specific user or interface. The L-PDF configuration defines the way in which the statistics are output.

To configure properties for statistics output, include the `policy-decision-statistics-profile` statement at the `[edit accounting-options]` hierarchy level. A new `traceoptions` configuration is available at the `[edit system services local-policy-decision-function]` hierarchy level. To configure a dynamic profile to attach a specified service set to an interface, include the `service` statement at the `[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number family inet]` hierarchy level. To attach a service set to a static interface, include the `service-set service-set-name` statement at the `[edit interfaces interface-name unit logical-unit-number family inet service (input | output)]` hierarchy level. For more information on service sets, see *Understanding Service Sets*.

The following related operational commands are supported:

- `show services local-policy-decision-function flows`
- `show/clear services local-policy-decision-function statistics`
- `show/clear services application-aware-access-list statistics`

For more information on the CLI configuration, see the ["Best-Effort Application Identification of DPI-Serviced Flows" on page 3](#). For more information on the operational commands, see the [CLI Explorer](#).

NOTE: Because the Junos OS extension-provider package (variously known as JSF, MP-SDK, and eJunos in releases earlier than 12.3) lacks aggressive constraint checks, you should not set the `policy-db-size` statement at the `[edit chassis fpc slot-number pic pic-number adaptive-services service-package extension-provider]` hierarchy level to a high value. For Junos Application Aware (previously known as Dynamic Application Awareness) configurations, the recommended values for the extension-provider package options at this hierarchy level are as follows:

- `control-cores = 1`
- `data-cores = 7`
- `object-cache-size = 1280` (for Multiservices 400 PIC and Multiservices DPC)
- `policy-db-size = 200`
- Include these package values: `jservices-idp`, `jservices-appid`, `jservices-llpdf`, `jservices-aacl`

Release History Table

Release	Description
16.1R1	Starting with Junos OS Release 16.1R1, the local policy decision function is not supported.

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Best-Effort Application Identification of DPI-Serviced Flows

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Features That Support Application-Level Filtering

The application-aware access list (AACL) service uses application names and groups as matching criteria for filtering traffic. The service defines the applications and application groups for which statistics are collected for a specific user or interface.

The local policy decision function (L-PDF) enables you to configure properties for statistics output. L-PDF supports a process that regulates collection of statistics related to applications and application groups and tracking of information about dynamic subscribers and static interfaces.

Best-Effort Application Determination

Typically, APPID conclusively determines the Layer 7 application associated with a given DPI-serviced flow. In these cases, the application identification is final. Occasionally, APPID is only able to make an initial, inconclusive determination of the Layer 7 application associated with a given flow. This is referred to as a *best-effort* application identification. In such cases, the APPID process continues processing

packets on that flow and might subsequently make a conclusive determination of the application associated with that flow. In some cases of best-effort application identification, the flow ends before a final application determination can be made.

APPID, AACL, and L-PDF Processing in Preconvergence Scenarios

The following sections describe APPID, AACL, and L-PDF processing in various stages of application identification for a DPI-serviced flow of TCP/UDP/ICMP traffic.

Prior to a Final or Best-Effort Application Identification

During the time that APPID has not yet made either a final or best-effort determination of the application associated with a given flow, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has not yet made either a final or best-effort determination of the associated application:

- `show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)`
- `show services application-aware-access-list flows (interface interface-name | subscriber subscriber-name)`

In the command output, the Action field displays `accept` and the Application or Application group field displays `unknown` for a flow for which APPID has not yet made either a final or best-effort determination of the associated application.

Upon Best-Effort Application Identification

When a best-effort application determination is made, AACL does not apply any AACL term actions configured for that flow. There are a number of reasons for this, one being that the action itself (such as `discard`) can make a final application determination impossible. Instead, AACL or L-PDF tracks the flow and accepts all packets for that flow until a final determination is made, at which time the normal AACL or L-PDFL actions are fully applied to the flow.

While Application Identification Is on a Best-Effort Basis

During the time that APPID identification of the application associated with a given flow is on a best-effort basis, the flow does not contribute to any per-subscriber or per-application statistics collection.

The output of the following operational mode commands includes flows for which APPID has only made a best-effort determination of the associated application:

- show services local-policy-decision-function flows (interface *interface-name* | subscriber *subscriber-name*)
- show services application-aware-access-list flows (interface *interface-name* | subscriber *subscriber-name*)

In the command output, the Action field displays accept and the Application or Application group field displays unknown for a flow for which APPID has only made a best-effort determination of the associated application.

If a Flow Ends Before an Application Identification Is Made

If a flow ends before APPID has made either a final or a best-effort application identification, AACL or L-PDF uses the unknown application ID as a final determination and performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the count AACL term action is configured for the application-group-any application, then the statistics for that flow are collected and aggregated against the count bucket type, and reported as such.

If a Flow Ends While Application Identification on a Best-Effort Basis

If a flow ends while the application identification is on a best-effort basis, AACL or L-PDF uses that best-effort determination as a final determination. AACL or L-PDF performs any necessary collection, aggregation, and reporting of statistics based on that Layer 7 application. In particular, if the count AACL term action is configured for that Layer 7 application, then the statistics for the flow are collected and aggregated against the AACL or L-PDF statistics. However, in the case of nested applications, AACL and L-PDF do not consider the best-effort determination as final and the nested application is reported as an unknown application.

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Configuring Statistics Profiles

The local policy decision function (L-PDF) enables you to configure properties for statistics output. To do this, you create a statistics profile, which configures the files to which statistics records are exported and the format that is exported. There are two configurations you can use to specify the profile, as described in the following subsections:

NOTE: You must use the same configuration stanza for specifying the profile and the file selection. If configurations are committed in both hierarchies, the one at the [edit system services local-policy-decision-function] hierarchy level takes precedence.

NOTE:

- When a session closes before APPID has identified nested applications, the session is treated as a best-effort session and L-PDF does not get the nested application information. In such cases, nested applications are 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" on page 3](#).

NOTE: For rms- interfaces, the statistics received from the active Multiservices PICs in the RMS group are combined with the statistics of the reported ended flows kept on the Routing Engine. The aggregated value is written to the statistics file. In the case of AMS interfaces, all the Multiservices PICs consisting of the AMS group reports statistics independently. These statistics are aggregated on the Routing Engine. The Routing Engine runs an independent timer, which on expiry writes the aggregated entry in the statistics file. This method of collection causes the statistics data in the statistics file to be displayed with a small delay.

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Applying L-PDF Profiles to Service Sets

You can optionally apply policy decision statistics profiles as part of a service-set definition. To do this, you include the `policy-decision-statistics-profile` statement at the `[edit services service-set service-set-name]` hierarchy level:

```
policy-decision-statistics-profile profile-name;
```

NOTE: To provide high availability for the policy decision statistics, associate the service-set definition with a redundant services PIC (rsp) interface.

You can include only one profile name in the specification for the `application-aware access-list` statement.

The following example shows a sample configuration for attachment of an L-PDF statistics profile:

```
services {  
  service-set test_aacl_sset {  
    aacl-rules aacl_rule;  
    policy-decision-statistics-profile {  
      pdf_stats_prof;  
    }  
    interface-service {  
      service-interface ms-0/3/0.0;  
    }  
  }  
}
```

NOTE: Only one service set can be applied to a single interface when L-PDF functionality is used.

The following example shows a sample configuration for attachment of a service set to a static interface:

```

interfaces {
  fe-0/0/0 {
    vlan-tagging;
    unit 1 {
      vlan-id 1;
      family inet {
        service {
          input {
            service-set test_aacl_sset;
          }
          output {
            service-set test_aacl_sset;
          }
        }
        address 10.1.1.1/24;
      }
    }
  }
}

```

NOTE: The `session-offload` statement at the `[edit chassis fpc slot-number pic number adaptive-services service-package extension-provider]` hierarchy level controls session offload behavior for Multiservices DPCs on MX Series routers. It controls session offload on a per-device basis, where a device is a Multiservices interface (`ms-fpc-pic-port`). Currently, the session offload function is supported for at most one Multiservices interface. When the offload function is enabled, we recommended that you limit Junos Application Aware (previously known as Dynamic Application Awareness) features to that Multiservices interface.

The default is to not offload any sessions.

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Tracing L-PDF Operations

Tracing operations track L-PDF operations and record them in a log file. The logged error descriptions provide detailed information to help you solve problems faster.

By default, no events are traced. If you include the `traceoptions` statement at the `[edit system services local-policy-decision-function]` hierarchy level, you can customize the trace file settings:

```
traceoptions {  
    file filename <files number> <size size>;  
    flag flag;  
}
```

The flags track the following information:

- `all`—Everything
- `configuration`—Configuration traces
- `database`—Database traces
- `general`—Miscellaneous traces
- `gres`—Graceful Routing Engine switchover (GRES) traces
- `ptsp-statistics`—PTSP statistics traces
- `rtsock`—Routing socket traces
- `statistics`—Statistics traces
- `subscriber`—Subscriber traces

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aac1-fields

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Syntax

```
aac1-fields {  
    field-name;  
}
```

Hierarchy Level

```
[edit system services local-policy-decision-function statistics aac1-statistics-profile profile-name]
```

Description

Define the statistics to collect in a data log file.

Options

field-name—Name of the field:

- address—IPv4 address
- all-fields—All available fields
- application—Application name
- application-group—Application group name
- input-bytes—Number of input bytes
- input-interface—Input interface name
- input-packets—Number of input packets
- ipv6-address—IPv6 address
- ipv6-prefix-length—Prefix length associated with the displayed IPv6 address
- mask—Netmask
- output-bytes—Number of output bytes
- output-packets—Number of output packets
- subscriber-name—Subscriber name
- timestamp—Timestamp
- vrf-name—VPN routing and forwarding (VRF) name

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

IPv6 support introduced in Junos OS Release 12.2.

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acl-statistics-profile

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Syntax

```
acl-statistics-profile profile-name {  
    acl-fields {  
        field-name;  
    }  
    file filename;  
    record-mode (interim-active-only | interim-full);  
    report-interval minutes;  
}
```

Hierarchy Level

```
[edit services service-set service-set-name],
[edit system services local-policy-decision-function statistics]
```

Description

Create an ACL statistics profile, which configures the files to which statistics records are exported and the format that is exported.

Options

file filename—Name of the file to receive the statistics data output. Enclose the name within quotation marks. All files are placed in the directory `/var/stats/acl`.

profile-name—Identifier for the profile.

record-mode—Record mode for the reporting interval; possible values are `interim-active-only`, which reports only statistics that have changed, or `interim-full`, which reports all available statistics.

report-interval minutes—Frequency at which statistics are recorded, in minutes.

- **Default:** 15 minutes
- **Range:** 5 through 1440 minutes

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

record-mode option introduced in Junos OS Release 10.2.

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address

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Syntax

```
address address-name {
  destination {
    ip address</prefix-length>;
    port-range {
      tcp [ ports-and-port-ranges ];
      udp [ ports-and-port-ranges ];
    }
  }
}
```

```

source {
    ip address</prefix-length>;
    port-range {
        tcp [ ports-and-port-ranges ];
        udp [ ports-and-port-ranges ];
    }
}
order number;
}

```

Hierarchy Level

```
[edit services application-identification rule rule-name]
```

Description

Define address properties for application-identification rule processing. This statement is mandatory; you must specify either the destination or source properties.

Options

address-name—Identifier for address information.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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application (Defining)

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Syntax

```
application application-name {  
    disable;  
    idle-timeout seconds;  
    index number;  
    port-mapping {  
        disable;  
        port-range {  
            tcp [ ports-and-port-ranges ];  
            udp [ ports-and-port-ranges ];  
        }  
    }  
}
```

```

    session-timeout seconds;
    type type;
    type-of-service service-type;
}

```

Hierarchy Level

```
[edit services application-identification]
```

Description

Define the application and its properties.

The remaining statements are explained separately. See [CLI Explorer](#).

Options

application-name—Identifier for the application. This is a mandatory value and has a maximum length of 32 characters.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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application (Including in Rule)

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Syntax

```
application application-name;
```

Hierarchy Level

```
[edit services application-identification rule rule-name]
```

Description

Identify the application for inclusion in a rule.

Options

application-name—Identifier for the application.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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application-aware-access-list-fields

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Syntax

```
application-aware-access-list-fields {
    field-name;
}
```

Hierarchy Level

```
[edit accounting-options policy-decision-statistics-profile profile-name]
```

Description

Define the statistics to collect in a data log file.

Options

field-name—Name of the field:

- `address`—IP address
- `application`—Application name
- `application-group`—Application group name
- `input-bytes`—Number of input bytes
- `input-interface`—Input interface name
- `input-packets`—Number of input packets
- `mask`—Netmask
- `output-bytes`—Number of output bytes
- `output-packets`—Number of output packets

- `subscriber-name`—Subscriber name
- `timestamp`—Timestamp
- `vrf-name`—VPN routing and forwarding (VRF) name

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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application-group

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Syntax

```
application-group group-name {
    disable;
    application-groups {
        application-group-name;
    }
    applications {
        application-name;
    }
    index number;
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Define the properties and contents of the application group.

Options

group-name—Unique identifier for the group.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support added in Junos OS release 19.3R2 and 19.4r1 for Next Gen Services on MX240, MX480, and MX960.

NOTE: The `disable` and `index` options are not supported for Next Gen Services.

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application-group-any

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Syntax

```
application-group-any;
```


Hierarchy Level

```
[edit services aac1 rule rule-name term term-name from]
```

Description

Match any application group defined in the database.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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application-groups (Services AACL)

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Syntax

```
application-groups [ application-group-names ];
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Identify one or more application groups defined in the application identification configuration for inclusion as a match condition.

Options

application-group-names—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.

Release Information

Statement introduced in Junos OS Release 9.5.

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application-groups (Services Application Identification)

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Syntax

```
application-groups {  
    application-group-name;  
}
```

Hierarchy Level

```
[edit services application-identification application-group group-name]
```

Description

Identify the list of application groups for inclusion in a larger application group. An *application-group-name* statement is mandatory.

Options

application-group-name—Identifier for the application group. Maximum length is 32 characters.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support added in Junos OS release 19.3R2 and 19.4r1 for Next Gen Services on MX240, MX480, and MX960.

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application-system-cache-timeout

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Syntax

```
application-system-cache-timeout seconds;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Configure the lifetime for entries in the application system cache.

Specify the timeout value in seconds for the application system cache (ASC) entries.

ASC saves the mapping between an application type and the corresponding destination IP address, destination port, protocol type, and service. By default, the ASC saves the mapping information for 3600 seconds.

NOTE: When you change the timeout value for the application system cache entries using the command `set services application-identification application-system-cache-timeout`, the cache entries need to be cleared to avoid inconsistency in timeout values of existing entries.

NOTE: ASC is not cleared when the IDP policy is loaded. Users need to manually clear or wait for the cache entries to expire.

Options

seconds— Lifetime for system cache entries, in seconds.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support added in Junos OS release 20.2R1 for Next Gen Services on MX240, MX480, and MX960 routers.

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application-unknown

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Syntax

```
application-unknown
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Enable AACL logging of flows for unknown applications.

Required Privilege Level

Release Information

Statement introduced in Junos OS Release 11.2.

RELATED DOCUMENTATION

[Configuring Logging of AACL Flows](#) | 14

applications (Services AACL)

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Syntax

```
applications [ application-names ];
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```


Description

Identify one or more applications defined in the application identification configuration for inclusion as a match condition.

Options

application-names—Identifiers of the applications.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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applications (Services Application Identification)

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Syntax

```
applications {
    application-name;
}
```

Hierarchy Level

```
[edit services application-identification application-group group-name]
```

Description

Identify the list of applications for inclusion in the application group.

Options

application-name—Identifier for the application. Maximum length is 32 characters.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support added in Junos OS release 19.3R2 and 19.4R1 for Next Gen Services on MX240, MX480, and MX960.

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Syntax

```
automatic {  
    interval hour;  
    start-time time;  
}
```

Hierarchy Level

```
[edit services application-identification download]
```

Description

Define automatic download properties.

Options

`interval hour`—Download interval in hours. The default is 24 and the range is from 1 through 168.

`start-time time`—Start-time value. The default is 0:00 and the range is from 0:00 through 24:00.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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bypass-traffic-on-exceeding-flow-limits

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Syntax

```
bypass-traffic-on-exceeding-flow-limits;
```

Hierarchy Level

```
[edit services service-set service-set-name service-set-options]
```

Description

Bypass traffic when exceeding the maximum flow limit.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.1.

Statement introduced in Junos OS Release 19.3R2 on MX240, MX480 and MX960 routers using the MX-SPC3 services card.

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chain-order

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Syntax

```
chain-order;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name]
```

Description

Signatures can contain multiple members. If the chain order feature is on, those members are read in order. By default, chain ordering is turned off. If a signature contains only one member, this option is ignored.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

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context

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Syntax

```
context value;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name member name]
```

Description

Define a service-specific context, such as http-url.

Options

value Use the specified service-specific context:

- http-header-content-type—Use the service context http-header-content-type.
- http-header-host—Use the service context http-header-host.
- http-url-parsed—Use the service context http-url-parsed.
- http-url-parsed-param-parsed—Use the service context http-url-parsed-param-parsed.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

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destination (Services)

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Syntax

```
destination {  
  ip address</prefix-length>;  
  port-range {  
    tcp [ ports-and-port-ranges ];  
    udp [ ports-and-port-ranges ];  
  }  
}
```

Hierarchy Level

```
[edit services application-identification rule rule-name address address-name]
```

Description

Define destination properties for application-identification rule processing.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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destination-address

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Syntax

```
destination-address address;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Specify the destination address for rule matching.

Options

address—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.

Release Information

Statement introduced in Junos OS Release 9.5.

IPv6 support introduced in Junos OS Release 12.2.

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destination-address-range

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Syntax

```
destination-address-range low minimum-value high maximum-value;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Specify the destination address range for rule matching.

Options

minimum-value—Lower boundary for the IPv4 or IPv6 address range.

maximum-value—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.

Release Information

Statement introduced in Junos OS Release 9.5.

IPv6 support introduced in Junos OS Release 12.2.

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destination-prefix-list (Services AACL)

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- Release Information | 94

Syntax

```
destination-prefix-list list-name;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

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

list-name—Destination prefix list.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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direction

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Syntax

```
direction (any | client-to-server | server-to-client) ;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name member name]
```

Description

Specify the connection direction of the packets to apply pattern matching.

Options

- any** Apply pattern matching to the packets from a client to a server and from a server to a client.
- client-to-server** Apply pattern matching to the packets from a client to the server.
- server-to-client** Apply pattern matching to the packets from a server to a client.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

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disable (APPID Application)

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Syntax

```
disable;
```

Hierarchy Level

```
[edit services application-identification application application-name]
```

Description

Disable this application definition.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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disable (APPID Application Group)

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Syntax

```
disable;
```

Hierarchy Level

```
[edit services application-identification application-group group-name]
```

Description

Disable application group properties.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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disable (APPID Port Mapping)

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- [Release Information](#) | 99

Syntax

```
disable;
```

Hierarchy Level

```
[edit services application-identification application application-name port-mapping]
```

Description

Disable port-mapping properties for application identification.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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disable-global-timeout-override

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- Hierarchy Level | 100
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- Release Information | 101

Syntax

```
disable-global-timeout-override;
```

Hierarchy Level

```
[edit interfaces interface-name services-options]  
[edit services service-set service-set-name service-set-options]
```

Description

Disallow overriding a global inactivity or session timeout.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

Support added in Junos OS Release 20.3R1 for Next Gen Services on MX240, MX480, and MX960 routers.

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download

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- [Hierarchy Level](#) | 102
- [Description](#) | 102
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- [Release Information](#) | 102

Syntax

```
download {  
  automatic {  
    interval hour;  
    start-time time;  
  }  
}
```

```
url url;  
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Define application download properties.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

| [Configuring Automatic Download of Application Package Updates](#) | 37

enable-asymmetric-traffic-processing

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- Release Information | 104

Syntax

```
enable-asymmetric-traffic-processing;
```

Hierarchy Level

```
[edit services service-set service-set-name service-set-options]
```

Description

Enable APPID to perform application matching on unidirectional traffic.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.2.

RELATED DOCUMENTATION

[Configuring APPID Support for Unidirectional Traffic](#) | 36

enable-heuristics

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- [Hierarchy Level](#) | 104
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Syntax

```
enable-heuristics;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

(Junos OS Release 12.1X47 and earlier—AppID 1.0 only) Enable APPID to identify encrypted data packets in point-to-point applications by using heuristics methodology.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.2.

Statement deprecated in Junos OS Release 12.3X48-D10 and later.

RELATED DOCUMENTATION

[Configuring APPID Support for Heuristics](#) | 35

file

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- [Description](#) | 106
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- [Release Information](#) | 107

Syntax

```
file file-name {
    archive-sites url;
    files file-number;
    size bytes;
    transfer-interval minutes;
}
```

Hierarchy Level

```
[edit system services local-policy-decision-function statistics]
```

Description

Specify a file to which statistics records are exported and the format that is exported.

Options

`archive-sites` [*url*]*—*Use one or more of the specified destinations for archiving data.

*file-name**—*Name of the file to receive the statistics data output.

`files` *file-number**—*(Optional) Use the specified maximum number of accounting files.

- **Range:** 3 through 1000 files
- **Default:** 3 files

If you specify a maximum number of files, you also must specify a maximum file size with the `size` option.

`size` *bytes**—*(Optional) Use the specified maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB).

- **Syntax:** *yk* to specify KB, *ym* to specify MB, or *yg* to specify GB

- **Range:** 262144 through 1073741824 or the maximum file size supported on your system

If you specify a maximum file size, you also must specify a maximum number of trace files with the `files` option.

`transfer-interval minutes`—Use the specified frequency at which to transfer files to archive sites, in minutes.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

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Syntax

```
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;
}
```

Hierarchy Level

```
[edit services aac1 rule rule-name term term-name]
```

Description

Specify match conditions for the AACL term.

Options

For information on match conditions, see the description of firewall filter match conditions in the [Routing Policies, Firewall Filters, and Traffic Policers User Guide](#).

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced before Junos OS Release 9.5.

RELATED DOCUMENTATION

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idle-timeout

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- [Release Information](#) | 110

Syntax

```
idle-timeout seconds;
```

Hierarchy Level

```
[edit services application-identification application application-name]
```

Description

Define idle timeout for an application in seconds. When the timeout period expires, the session ends if no packets have been received.

Options

seconds—Idle timeout period.

- **Default:** 30
- **Range:** 1 through 604,800

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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ignore-errors

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Syntax

```
ignore-errors <alg> <tcp>;
```

Hierarchy Level

```
[edit interfaces interface-name services-options]
```

Description

Define settings for minimizing TCP packet drops during stateful firewall processing.

NOTE: ignore-errors option is not supported on adaptive services interfaces (sp-x/y/z).

Options

`alg`—(Optional) Mediate ALG behavior that results in dropping malformed packets or random packets when the software is unable to allocate resources.

`tcp`—(Optional) Prevent software from dropping packets that fail TCP SYN checks.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.1.

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index (Applications)

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Syntax

```
index number;
```

Hierarchy Level

```
[edit services application-identification application application-name],  
[edit services application-identification application-group group-name]
```

Description

Assign an application or application-group index number. This is a mandatory value.

Options

number—Index number; must be a unique, unsigned value.

- **Range:** 0 through 65,535

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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[Configuring Application Groups | 29](#)

index (Nested Applications)

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- [Description | 115](#)
- [Options | 115](#)
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- [Release Information | 115](#)

Syntax

```
index number;
```

Hierarchy Level

```
[edit services application-identification nested-application name]
```

Description

Set a number that is a one-to-one mapping to the application name. The application name is used to ensure that each signature definition is unique.

Options

number Numeric value associated with an application name. The index range for predefined applications is from 1 through 32,767. The index range for custom applications and custom nested applications is from 32,768 through 65,534.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

inactivity-non-tcp-timeout

IN THIS SECTION

- [Syntax | 116](#)
- [Hierarchy Level | 116](#)
- [Description | 116](#)
- [Options | 116](#)
- [Required Privilege Level | 117](#)
- [Release Information | 117](#)

Syntax

```
inactivity-non-tcp-timeout seconds;
```

Hierarchy Level

```
[edit interfaces interface-name services-options]
```

Description

Define the inactivity timeout period for non-TCP established sessions in seconds.

Options

seconds—Timeout period.

- **Range:** 4 through 86,400

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

| [Defining an Application Identification](#) | 22

inactivity-tcp-timeout

IN THIS SECTION

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- [Description](#) | 118
- [Options](#) | 118
- [Required Privilege Level](#) | 118
- [Release Information](#) | 118

Syntax

```
inactivity-tcp-timeout seconds;
```

Hierarchy Level

```
[edit interfaces interface-name services-options]
```

Description

Define the inactivity timeout period for TCP established sessions in seconds.

Options

seconds—Timeout period.

- **Range:** 4 through 86,400

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

[Defining an Application Identification](#) | 22

ip

IN THIS SECTION

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- [Hierarchy Level](#) | 119
- [Description](#) | 119
- [Options](#) | 120
- [Required Privilege Level](#) | 120
- [Release Information](#) | 120

Syntax

```
ip address</prefix-length>;
```

Hierarchy Level

```
[edit services application-identification rule rule-name address destination],  
[edit services application-identification rule rule-name address source]
```

Description

Define an IP address and netmask for identifying the traffic destination or source.

Options

*address**</prefix-length>*—IP address and netmask.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring APPID Rules](#) | 24

local-policy-decision-function

IN THIS SECTION

- [Syntax](#) | 121
- [Hierarchy Level](#) | 121
- [Description](#) | 121
- [Required Privilege Level](#) | 122
- [Release Information](#) | 122

Syntax

```

local-policy-decision-function {
  statistics {
    aac1-statistics-profile profile-name {
      aac1-fields {
        field-name;
      }
      file filename;
      report-interval minutes;
    }
    file file-name {
      archive-sites url;
      files file-number;
      size bytes;
      transfer-interval minutes;
    }
    record-type (delta | interim);
  }
  traceoptions {
    file filename <files number> <size size>;
    flag flag;
    no-remote-trace;
  }
}

```

Hierarchy Level

```
[edit system services]
```

Description

Specify L-PDF properties.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

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log (aaci)

IN THIS SECTION

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- [Hierarchy Level](#) | 123
- [Description](#) | 123
- [Options](#) | 123
- [Required Privilege Level](#) | 123
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Syntax

```
log event-type
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name then ]
```

Description

Enable AACL logging of flows for known or unknown applications.

Options

event-type—Enable logging of the specified *event-type*:

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

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.2.

RELATED DOCUMENTATION

[Configuring Logging of AACL Flows | 14](#)

match-direction

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- [Syntax | 124](#)
- [Hierarchy Level | 124](#)
- [Description | 124](#)
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- [Required Privilege Level | 125](#)
- [Release Information | 125](#)

Syntax

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

Hierarchy Level

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

Description

Specify the direction in which the rule match is applied.

Options

input—Apply the rule match on the input side of the interface.

output—Apply the rule match on the output side of the interface.

input-output—Apply the rule match bidirectionally.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

| [Configuring AACL Rules](#) | 6

max-checked-bytes

IN THIS SECTION

- [Syntax](#) | 126
- [Hierarchy Level](#) | 126
- [Description](#) | 126
- [Options](#) | 126
- [Required Privilege Level](#) | 126

Syntax

```
max-checked-bytes bytes;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Specify the maximum number of bytes to be inspected.

Options

bytes—Maximum number of bytes.

- **Range:** 0 through 100,000

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

maximum-transactions

IN THIS SECTION

- [Syntax](#) | 127
- [Hierarchy Level](#) | 127
- [Description](#) | 128
- [Options](#) | 128
- [Required Privilege Level](#) | 128
- [Release Information](#) | 128

Syntax

```
maximum-transactions number;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name]
```


Description

Set the maximum number of transactions required before a match is made.

Options

number Maximum number of transactions.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

member

IN THIS SECTION

- [Syntax](#) | 129
- [Hierarchy Level](#) | 129
- [Description](#) | 129

- Options | 129
- Required Privilege Level | 129
- Release Information | 130

Syntax

```
member name;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name]
```

Description

Define a member name for a custom nested application signature definition. Custom definitions can contain multiple members that define attributes for an application.

Options

name Name of member for a custom nested application signature definition.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

min-checked-bytes

IN THIS SECTION

- [Syntax](#) | 130
- [Hierarchy Level](#) | 130
- [Description](#) | 131
- [Options](#) | 131
- [Required Privilege Level](#) | 131
- [Release Information](#) | 131

Syntax

```
min-checked-bytes bytes;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Specify the minimum number of bytes to be inspected.

Options

bytes—Minimum number of bytes.

- **Range:** 0 through 2000

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

nested-application

IN THIS SECTION

- [Syntax](#) | 132
- [Hierarchy Level](#) | 132

- Description | 133
- Options | 133
- Required Privilege Level | 133
- Release Information | 133

Syntax

```
nested-application name {
  index number;
  protocol protocol ;
  signature name {
    chain-order ;
    maximum-transactions number;
    member name {
      context (http-header-content-type | http-header-host | http-url-parsed | http-url-
parsed-param-parsed);
      direction (any | client-to-server | server-to-client);
      pattern dfa-pattern;
    }
    order number;
  }
  type type;
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Configure a custom nested application definition, which is used by the system to identify the nested application as it passes through the device. Custom nested application definitions can be used for nested applications that are not part of the Juniper Networks predefined nested application database.

Options

name Name of nested application.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

| [Application Identification for Nested Applications](#) | 30

nested-application-settings

IN THIS SECTION

- [Syntax | 134](#)
- [Hierarchy Level | 134](#)
- [Description | 134](#)
- [Required Privilege Level | 135](#)
- [Release Information | 135](#)

Syntax

```
nested-application-settings {  
    no-application-system-cache;  
    no-nested-application;  
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Configure nested application options for application identification services.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

Statement deprecated in Junos OS Release 12.3X48-D10.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

nested-application-unknown

IN THIS SECTION

- [Syntax](#) | 135
- [Hierarchy Level](#) | 136
- [Description](#) | 136
- [Required Privilege Level](#) | 136
- [Release Information](#) | 136

Syntax

```
nested-application-unknown
```


Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Enable AACL logging of flows for unknown nested applications.

Required Privilege Level

interface	To view this statement in the configuration.
interface-control	To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

[Configuring Logging of AACL Flows](#) | 14

nested-applications

IN THIS SECTION

● [Syntax](#) | 137

- [Hierarchy Level | 137](#)
- [Description | 137](#)
- [Options | 137](#)
- [Required Privilege Level | 137](#)
- [Release Information | 138](#)

Syntax

```
nested-applications [ nested-application-names ];
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Identify one or more nested applications defined in the application identification configuration for inclusion as a match condition.

Options

nested-application-names—Identifiers of the nested applications.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.1.

RELATED DOCUMENTATION

[Configuring Match Conditions in ACL Rules](#) | 8

no-application-identification

IN THIS SECTION

- [Syntax](#) | 138
- [Hierarchy Level](#) | 139
- [Description](#) | 139
- [Required Privilege Level](#) | 139
- [Release Information](#) | 139

Syntax

```
no-application-identification;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Disable all application identification methods.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

no-application-system-cache

IN THIS SECTION

- [Syntax](#) | 140
- [Hierarchy Level](#) | 140

- [Description | 140](#)
- [Required Privilege Level | 140](#)
- [Release Information | 141](#)

Syntax

```
no-application-system-cache;
```

Hierarchy Level

```
[edit services application-identification],  
[edit services application-identification nested-application-settings]
```

Description

Application identification information is saved in the application system cache to improve performance. This cache is updated when a different application is identified. This caching is turned on by default. Use the `no-application-system-cache` statement to turn it off.

ASC is enabled by default when a session is created. You can manually turn this caching off using the `set services application-identification no-application-system-cache` command. You can re-enable the ASC by using the `set services application-identification application-system-cache` command.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support for Next Gen Services introduced in Junos OS Release 19.3R2 and 19.4R1 on MX Series routers MX240, MX480 and MX960.

Statement deprecated in Junos OS Release 12.3X48-D10 at the [edit services application-identification nested-application-settings] hierarchy level.

RELATED DOCUMENTATION

[Configuring Global APPID Properties | 33](#)

[Application Identification for Nested Applications | 30](#)

no-clear-application-system-cache

IN THIS SECTION

- [Syntax | 141](#)
- [Hierarchy Level | 142](#)
- [Description | 142](#)
- [Required Privilege Level | 142](#)
- [Release Information | 142](#)

Syntax

```
no-clear-application-system-cache;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Disable clearing the application system cache.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

no-nested-application

IN THIS SECTION

- [Syntax](#) | 143
- [Hierarchy Level](#) | 143

- [Description | 143](#)
- [Required Privilege Level | 143](#)
- [Release Information | 144](#)

Syntax

```
no-nested-application;
```

Hierarchy Level

```
[edit services application-identification nested-application-settings]
```

Description

Sometimes there is a need to identify multiple different applications running on the same Layer 7 protocols. For example, both Facebook and Yahoo Messenger can run over HTTP, but there is a need to identify them as two different applications. To do this, the application layer is split into two layers: Layer 7 applications and Layer 7 protocols. This function is turned on by default. Use the `no-nested-application` statement to turn it off.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

Statement deprecated in Junos OS Release 12.3X48-D10.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

no-protocol-method

IN THIS SECTION

- [Syntax](#) | 144
- [Hierarchy Level](#) | 144
- [Description](#) | 145
- [Required Privilege Level](#) | 145
- [Release Information](#) | 145

Syntax

```
no-protocol-method;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Disable the protocol-based application identification method.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.1.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

no-signature-based

IN THIS SECTION

- [Syntax](#) | 146
- [Hierarchy Level](#) | 146
- [Description](#) | 146
- [Required Privilege Level](#) | 146
- [Release Information](#) | 146

Syntax

```
no-signature-based;
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Disable the signature-based application identification method.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring Global APPID Properties](#) | 33

order (Services Application Identification)

IN THIS SECTION

- [Syntax | 147](#)
- [Hierarchy Level | 147](#)
- [Description | 147](#)
- [Options | 148](#)
- [Required Privilege Level | 148](#)
- [Release Information | 148](#)

Syntax

```
order number;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name member name],  
[edit services application-identification rule rule-name address]
```

Description

Define application matching priority. For address configurations, the order number resolves the conflict when multiple address entries are matched for a specific session. The lower number has higher priority.

Options

number—Order number. This value is mandatory and must be unique.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring APPID Rules | 24](#)

[Application Identification for Nested Applications | 30](#)

pattern

IN THIS SECTION

- [Syntax | 149](#)
- [Hierarchy Level | 149](#)
- [Description | 149](#)
- [Options | 149](#)
- [Required Privilege Level | 149](#)
- [Release Information | 149](#)

Syntax

```
pattern dfa-pattern;
```

Hierarchy Level

```
[edit services application-identification nested-application name signature name member name]
```

Description

Define an attack pattern to be detected.

Options

dfa-pattern Pattern of attack to match. Deterministic Finite Automata (DFA) is a powerful pattern matching engine.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

policy-decision-statistics-profile

IN THIS SECTION

- [Syntax](#) | 150
- [Hierarchy Level](#) | 150
- [Description](#) | 151
- [Options](#) | 151
- [Required Privilege Level](#) | 151
- [Release Information](#) | 152

Syntax

```
policy-decision-statistics-profile profile-name {  
    acl-fields {  
        field-name;  
    }  
    file filename;  
    files file-number;  
    size bytes;  
}
```

Hierarchy Level

```
[edit accounting-options],  
[edit services service-set service-set-name]
```

Description

Create a policy decision statistics profile, which configures the files to which statistics records are exported and the format that is exported.

Options

file filename—Use the specified file to receive the accounting-data output. Enclose the name within quotation marks. All files are placed in the directory **/var/log**.

files number—(Optional) Use the specified maximum number of accounting files.

- **Range:** 2 through 1000 files
- **Default:** 2 files

If you specify a maximum number of files, you also must specify a maximum file size with the *size* option.

profile-name—Name of the policy decision statistics profile.

size size—(Optional) Use the specified maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB).

- **Syntax:** *kb* to specify KB, *mb* to specify MB, or *gb* to specify GB
- **Range:** 10,240 through 1,073,741,824 or the maximum file size supported on your system

If you specify a maximum file size, you also must specify a maximum number of trace files with the *files* option.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Network Management and Monitoring Guide](#)

[Configuring Statistics Profiles](#) | 50

port-mapping

IN THIS SECTION

- [Syntax](#) | 152
- [Hierarchy Level](#) | 153
- [Description](#) | 153
- [Required Privilege Level](#) | 153
- [Release Information](#) | 153

Syntax

```
port-mapping {  
  disable;  
  port-range {  
    tcp [ ports-and-port-ranges ];  
    udp [ ports-and-port-ranges ];  
  }  
}
```

Hierarchy Level

```
[edit services application-identification application application-name]
```

Description

Define port-mapping properties for application identification.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

| [Defining an Application Identification](#) | 22

port-range

IN THIS SECTION

● [Syntax](#) | 154

- [Hierarchy Level | 154](#)
- [Description | 154](#)
- [Options | 154](#)
- [Required Privilege Level | 155](#)
- [Release Information | 155](#)

Syntax

```
port-range {
    tcp [ ports-and-port-ranges ];
    udp [ ports-and-port-ranges ];
}
```

Hierarchy Level

```
[edit services application-identification application application-name port-mapping],
[edit services application-identification rule rule-name address destination],
[edit services application-identification rule rule-name address source]
```

Description

Define TCP and UDP port numbers or numeric ranges. For port-mapping configurations, this entry is required if the parent node exists.

Options

ports-and-port-ranges—Individual port numbers, numeric port ranges, or both. Separate the values with spaces. The format for numeric port ranges is *minimum-value-maximum-value*.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Defining an Application Identification | 22](#)

[Configuring APPID Rules | 24](#)

profile

IN THIS SECTION

- [Syntax | 156](#)
- [Hierarchy Level | 156](#)
- [Description | 156](#)
- [Options | 156](#)
- [Required Privilege Level | 156](#)
- [Release Information | 156](#)

Syntax

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

Hierarchy Level

```
[edit services application-identification]
```

Description

Define members of the application profile, which consists of one or more rule sets.

Options

profile-name—Identifier for the application profile.

The remaining statement is explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

Support added in Junos OS release 19.3R2 and 19.4R1 for Next Gen Services on MX240, MX480, and MX960.

RELATED DOCUMENTATION

| [Configuring Application Profiles](#) | 28

protocol

IN THIS SECTION

- [Syntax](#) | 157
- [Hierarchy Level](#) | 157
- [Description](#) | 158
- [Options](#) | 158
- [Required Privilege Level](#) | 158
- [Release Information](#) | 158

Syntax

```
protocol protocol;
```

Hierarchy Level

```
[edit services application-identification nested-application name]
```

Description

Identify the protocol that is monitored to identify nested applications. HTTP is supported.

Options

protocol An agreed-upon or standardized method for transmitting data and establishing communications between different devices. The value `http` is supported.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

[Application Identification for Nested Applications](#) | 30

rule (AACL Rule Set)

IN THIS SECTION

- [Syntax](#) | 159
- [Hierarchy Level](#) | 160

- Description | 160
- Options | 160
- Required Privilege Level | 160
- Release Information | 160

Syntax

```
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;
    }
  }
}
```


Hierarchy Level

```
[edit services aacl],  
[edit services aacl rule-set rule-set-name]
```

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. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

| [Configuring AACL Rules](#) | 6

rule (Application Identification)

IN THIS SECTION

- [Syntax | 161](#)
- [Hierarchy Level | 162](#)
- [Description | 162](#)
- [Options | 162](#)
- [Required Privilege Level | 162](#)
- [Release Information | 162](#)

Syntax

```
rule rule-name {  
    address {  
        destination {  
            ip address</prefix-length>;  
            port-range {  
                tcp [ ports-and-port-ranges ];  
                udp [ ports-and-port-ranges ];  
            }  
        }  
        source {  
            ip address</prefix-length>;  
            port-range {  
                tcp [ ports-and-port-ranges ];  
                udp [ ports-and-port-ranges ];  
            }  
        }  
        order number;  
    }  
    application application-name;  
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Define properties for application-identification rule processing.

Options

rule-name—Unique identifier for the rule.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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rule (Including in Rule Set)

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Syntax

```
rule rule-name;
```

Hierarchy Level

```
[edit services application-identification rule-set rule-set-name]
```

Description

Identify rules for inclusion in application rule set.

Options

rule-name—Unique identifier for the rule.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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rule-set (Services AAACL)

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Syntax

```
rule-set rule-set-name {  
    [rule rule-names ];  
}
```

Hierarchy Level

```
[edit services aac1]
```

Description

Specify the rule set the router uses when applying this service.

Options

rule-set-name—Identifier for the collection of rules that constitute this rule set.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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rule-set (Services Application Identification)

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Syntax

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

Hierarchy Level

```
[edit services application-identification],  
[edit services application-identification profile profile-name]
```

Description

Define members of rule set.

Options

rule-set-name—Unique identifier for the rule set.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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service-set (Services)

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Syntax

```

service-set service-set-name {
    allow-multicast;
    captive-portal-content-delivery-profile;
    cos-options {
        match-rules-on-reverse-flow;
    }
    cos-rules [cos-rule-name];
    extension-service service-name {
        provider-specific-rules-configuration;
    }
    (ids-rules rule-name | ids-rule-sets rule-set-name);
    interface-service {
        load-balancing-options {
            hash-keys {
                egress-key (destination-ip | source-ip);
                ingress-key (destination-ip | source-ip);
            }
        }
        service-interface interface-name;
    }
    ipsec-vpn-options {
        anti-replay-window-size bits;
        clear-dont-fragment-bit;
        ike-access-profile profile-name;
        local-gateway address;
        no-anti-replay;
        no-certificate-chain-in-ike;
        passive-mode-tunneling;
        trusted-ca [ ca-profile-names ];
        tunnel-mtu bytes;
    }
}

```

```

    udp-encapsulation {
        <udp-dest-port destination-port>;
    }
}
ip-reassembly-rules rule-name;
(ipsec-vpn-rules rule-name | ipsec-vpn-rule-sets rule-set-name);
max-flows number;
max-drop-flows {
    ingress ingress-flows;
    egress egress-flows;
}
max-session-setup-rate max-setup-rate;
nat-options {
    land-attack-check (ip-only | ip-port);
    max-sessions-per-subscriber session-number;

    stateful-nat64 {
        clear-dont-fragment-bit;
    }
}
(nat-rules rule-name | nat-rule-sets rule-set-name);
next-hop-service {
    inside-service-interface interface-name.unit-number;
    outside-service-interface interface-name.unit-number;
    outside-service-interface-type local;
    service-interface-pool name;
}
pcp-rules rule-name;
(pgcp-rules rule-name | pgcp-rule-sets rule-set-name);
(ptsp-rules rule-name | ptsp-rule-sets rule-set-name);
service-set-options {
    bypass-traffic-on-exceeding-flow-limits;
    bypass-traffic-on-pic-failure;
    disable-session-open-syslog;
    enable-asymmetric-traffic-processing;
    header-integrity-check;
    routing-engine-services;
    static-subscriber-application;
    subscriber-awareness;
    support-uni-directional-traffic;
}
snmp-trap-thresholds {
    flows high high-threshold | low low-threshold;
}

```

```

        nat-address-port high-threshold | low low-threshold;
    }
}
software-options {
    dslite-ipv6-prefix-length dslite-ipv6-prefix-length;
}
(software-rules rule-name | software-rule-sets rule-set-name);
(stateful-firewall-rules rule-name | stateful-firewall-rule-sets rule-set-name);
syslog {
    host hostname {
        class {
            alg-logs;
            deterministic-nat-configuration-log;
            ids-logs;
            nat-logs;
            packet-logs;
            pcp-logs;
            session-logs <open | close>;
            stateful-firewall-logs ;
        }
        services severity-level;
        facility-override facility-name;
        interface-service prefix-value;
        port port-number;
        services severity-level;
    }
}
(web-filter-profile | url-filter-profile) profile-name;
}

```

Hierarchy Level

[edit services]

Description

Define the service set.

NOTE: Use the `web-filter-profile` option starting in Junos OS Release 18.3R1 and use the `url-filter-profile` option in Junos OS Releases before 18.3R1.

Options

service-set-name—Name of the service set. You can include special characters, such as a forward slash (/), colon (:), or a period (.).

- **Range:** Up to 64 alphanumeric characters.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

system—To view this statement in the configuration.

system-control—To add this statement to the configuration.

Release Information

Statement introduced before Junos OS Release 7.4.

pgcp-rules and *pgcp-rule-sets* options added in Junos OS Release 8.4.

server-set-options option added in Junos OS Release 10.1.

ptsp-rules and *ptsp-rule-sets* options added in Junos OS Release 10.2.

software-rules and *clear-rule-sets* options added in Junos OS Release 10.4.

ip-reassembly-rules and *outside-service-interface-type* option added in Junos OS Release 13.1R1.

pcp-rules option added in Junos OS Release 13.2R1.

software-options option added in Junos OS Release 14.1.

subscriber-awareness option added in Junos OS Release 17.1R1.

url-filter-profile option added in Junos OS Release 17.2R1.

match-rules-on-reverse-flow option added in Junos OS Release 16.1R5 and 17.4R1.

no-certificate-chain-in-ike option added in Junos OS Release 18.2R1.

web-filter-profile option added in Junos OS Release 18.3R1, replacing the deprecated url-filter-profile option.

max-session-setup-rate option added in Junos OS Release 19.1R1, replacing the deprecated option max-session-creation rate, which was added in Junos OS Release 17.1R1.

Support added in Junos 20.2R1 for Next Gen Services NAT PT feature.

static-subscriber-application option added in Junos OS Release 21.2R1.

RELATED DOCUMENTATION

| *Understanding Service Sets*

service-set-options

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- [Hierarchy Level | 173](#)
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Syntax

```
service-set-options {  
    bypass-traffic-on-exceeding-flow-limits;  
    bypass-traffic-on-pic-failure;  
    enable-asymmetric-traffic-processing;  
    enable-descriptive-session-syslog;  
    header-integrity-check;  
    routing-engine-services;  
    static-subscriber-application;  
    subscriber-awareness;  
    support-uni-directional-traffic;  
    tcp-fast-open {  
        disabled;  
        drop;  
    }  
    tcp-non-syn {  
        drop-flow;  
        drop-flow-send-rst;  
    }  
    unidirectional-session-refreshing {  
        input;  
        output;  
    }  
}
```

Hierarchy Level

```
[edit services service-set service-set-name]
```

Description

Specify the service set options to apply to a service set.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.1.

enable-asymmetric-traffic-processing and support-uni-directional-traffic options added in Junos OS Release 11.2.

routing-engine-services option added in Junos OS Release 15.1.

enable-change-on-ams-redistribution option added in Junos OS Release 15.1.

subscriber-awareness option added in Junos OS Release 17.1.

tcp-fast-open option added in Junos OS Release 17.2.

enable-descriptive-session-syslog option added in Junos OS Release 20.3.

static-subscriber-application option added in Junos OS Release 21.2.

RELATED DOCUMENTATION

Configuring Service Sets to be Applied to Services Interfaces

[Configuring APPID Support for Unidirectional Traffic | 36](#)

session-timeout (Application Identification)

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- [Hierarchy Level | 175](#)

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Syntax

```
session-timeout seconds;
```

Hierarchy Level

```
[edit services application-identification application application-name]
```

Description

Define session lifetime for the specified application in seconds.

Options

seconds—Duration of session.

- **Default:** 3600
- **Range:** 1 through 604,800

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Defining an Application Identification](#) | 22

session-timeout (Interfaces)

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Syntax

```
session-timeout seconds;
```

Hierarchy Level

```
[edit interfaces interface-name services-options]
```

Description

Define session lifetime globally for the Multiservices interface in seconds.

Options

seconds—Duration of session.

- **Range:** 4 through 86,400

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

[Defining an Application Identification](#) | 22

signature

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Syntax

```
signature name {  
    chain-order;  
    maximum-transactions number;  
    member name {  
        context value;  
        direction (any | client-to-server | server-to-client);  
        pattern dfa-pattern;  
    }  
    order number;  
}
```

Hierarchy Level

```
[edit services application-identification nested-application name]
```

Description

Identify the name of the custom nested application signature definition. The name must be unique with a maximum length of 32 characters.

Options

name Name of the signature definition.

The remaining statements are described separately.

Required Privilege Level

system—To view this statement in the configuration.

system control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

| [Application Identification for Nested Applications](#) | 30

signature-method-all-ports

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- [Hierarchy Level | 180](#)
- [Description | 180](#)
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- [Release Information | 181](#)

Syntax

```
signature-method-all-ports
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Run signature matching on all traffic in application-identification. This is called the signature-match mode.

In the default mode, or fast-port-match mode, all traffic destined to well-known ports (up to 1024) immediately returns the final port match. However, the device runs signature matching for all traffic destined for port 80,

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.2.

RELATED DOCUMENTATION

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source

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Syntax

```
source {  
  ip address</prefix-length>;  
  port-range {  
    tcp [ ports-and-port-ranges ];  
    udp [ ports-and-port-ranges ];  
  }  
}
```

Hierarchy Level

```
[edit services application-identification rule rule-name address address-name]
```

Description

Define source properties for application-identification rule processing.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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source-address (AAACL)

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● [Syntax](#) | 183

- Hierarchy Level | 183
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- Release Information | 184

Syntax

```
source-address address;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Specify the source address for rule matching.

Options

address—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.

Release Information

Statement introduced in Junos OS Release 9.5.

IPv6 support introduced in Junos OS Release 12.2.

RELATED DOCUMENTATION

[Configuring AACL Rules](#) | 6

source-address-range

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Syntax

```
source-address-range low minimum-value high maximum-value;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Specify the source address range for rule matching.

Options

minimum-value—Lower boundary for the IPv4 or IPv6 address range.

maximum-value—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.

Release Information

Statement introduced in Junos OS Release 9.5.

IPv6 support introduced in Junos OS Release 12.2.

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source-prefix-list (Services AACL)

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Syntax

```
source-prefix-list list-name;
```

Hierarchy Level

```
[edit services aacl rule rule-name term term-name from]
```

Description

Specify the source prefix list for rule matching. You configure the prefix list by including the prefix-list statement at the [edit policy-options] hierarchy level.

Options

list-name—Source prefix list.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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source-prefix-list (Services IDS)

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Syntax

```
source-prefix-list list-name <except>;
```

Hierarchy Level

```
[edit services ids rule rule-name term term-name from]
```

Description

Specify the source prefix list for rule matching. You configure the prefix list by including the `prefix-list` statement at the `[edit policy-options]` hierarchy level.

Options

list-name—Destination prefix list.

`except`—(Optional) Exclude the specified prefix list from rule matching.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 8.2.

RELATED DOCUMENTATION

Configuring Match Conditions in IDS Rules

https://www.juniper.net/documentation/en_US/junos/information-products/pathway-pages/config-guide-policy/config-guide-policy.html

statistics (L-PDF)

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Syntax

```
statistics {  
    aac1-statistics-profile profile-name {  
        aac1-fields {  
            field-name;  
        }  
        file filename;  
        report-interval minutes;  
    }  
    file file-name {  
        archive-sites [ url ];  
        files file-number;  
        size bytes;  
        transfer-interval minutes;  
    }  
    record-type (delta | interim);  
}
```

Hierarchy Level

```
[edit system services local-policy-decision-function]
```

Description

Configure file and data specifications for recording ACL statistics.

Options

record-type—Use the specified record type; possible values are delta or interim.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 10.0.

RELATED DOCUMENTATION

[Configuring Statistics Profiles](#) | 50

support-uni-directional-traffic

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- [Hierarchy Level | 191](#)
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Syntax

```
support-uni-directional-traffic;
```

Hierarchy Level

```
[edit services service-set service-set-name service-set-options]
```

Description

Enable APPID to perform application matching on unidirectional traffic.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 11.2.

RELATED DOCUMENTATION

[Configuring APPID Support for Unidirectional Traffic](#) | 36

term

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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]
```

Description

Define the AACL term properties.

Options

term-name—Identifier for the term.

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

[Configuring AACL Rules](#) | 6

then

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- [Description](#) | 195
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Syntax

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

Hierarchy Level

```
[edit services aacl rule rule-name term term-name]
```

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

You can configure one of the following actions:

- **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.

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

policer *policer-name*—Apply rate-limiting properties to the traffic as configured at the [edit firewall policer *policer-name*] 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 Policies, Firewall Filters, and Traffic Policers User Guide](#).

The remaining statements are explained separately. See [CLI Explorer](#).

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

policer statement added in Junos OS Release 9.6.

nested-application option for the count statement added in Junos OS Release 11.1.

RELATED DOCUMENTATION

[Configuring AACL Rules | 6](#)

[Routing Policies, Firewall Filters, and Traffic Policers User Guide](#)

traceoptions (Application Identification)

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- Release Information | 198

Syntax

```
traceoptions {
    file filename <files number> <match regex> <size size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
}
```

Hierarchy Level

```
[edit services application-identification]
```

Description

Configure application identification tracing options.

To specify more than one tracing operation, include multiple `flag` statements.

Options

`file filename`—Use the specified file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory `/var/log`.

`files number`—(Optional) Use the specified maximum number of trace files. When a trace file named `trace-file` reaches its maximum size, it is renamed `trace-file.0`, then `trace-file.1`, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

- **Range:** 2 through 1000 files
- **Default:** 2 files

If you specify a maximum number of files, you also must specify a maximum file size with the `size` option.

flag—Tracing operation to perform. `all` is the only valid completion.

- `all`—Trace all events.

`match regex`—(Optional) Use the specified regular expression for lines to be logged.

`no-world-readable`—(Optional) Disallow any user to read the log file.

`size size`—(Optional) Use the specified maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named *trace-file* reaches this size, it is renamed *trace-file.0*. When the *trace-file* again reaches its maximum size, *trace-file.0* is renamed *trace-file.1* and *trace-file* is renamed *trace-file.0*. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

- **Syntax:** `yk` to specify KB, `ym` to specify MB, or `yg` to specify GB
- **Range:** 10,240 through 1,073,741,824 or the maximum file size supported on your system

If you specify a maximum file size, you also must specify a maximum number of trace files with the `files` option.

`world-readable`—(Optional) Allow any user to read the log file.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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traceoptions (Services Local Policy Decision Function)

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Syntax

```
traceoptions {  
    file filename <files number> <size size>;  
    flag flag;  
    no-remote-trace;  
}
```

Hierarchy Level

```
[edit services local-policy-decision-function],  
[edit system services local-policy-decision-function]
```


Description

Configure local policy decision function (L-PDF) tracing options.

Options

file filename—Use the specified file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory **/var/log**.

files number—(Optional) Use the specified maximum number of trace files. When a trace file named *trace-file* reaches its maximum size, it is renamed *trace-file.0*, then *trace-file.1*, and so on, until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

- **Range:** 2 through 1000 files
- **Default:** 2 files

If you specify a maximum number of files, you also must specify a maximum file size with the *size* option.

flag—Tracing operation to perform. To specify more than one flag, include multiple flag statements.

- *all*—Everything
- *configuration*—Configuration traces
- *database*—Database traces
- *general*—Miscellaneous traces
- *gres*—Graceful Routing Engine switchover (GRES) traces
- *ptsp-statistics*—PTSP statistics traces
- *rtsock*—Routing socket traces
- *statistics*—Statistics traces
- *subscriber*—Subscriber traces

no-remote-trace—Disable remote tracing.

size size—(Optional) Use the specified maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named *trace-file* reaches this size, it is renamed *trace-file.0*. When the *trace-file* again reaches its maximum size, *trace-file.0* is renamed *trace-file.1* and *trace-file* is

renamed *trace-file.0*. This renaming scheme continues until the maximum number of trace files is reached. Then the oldest trace file is overwritten.

- **Syntax:** *k* to specify KB, *m* to specify MB, or *g* to specify GB
- **Range:** 10,240 through 1,073,741,824 or the maximum file size supported on your system

If you specify a maximum file size, you also must specify a maximum number of trace files with the *files* option.

Required Privilege Level

routing and trace—To view this statement in the configuration.

routing-control and trace-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

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type

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Syntax

```
type type;
```

Hierarchy Level

```
[edit services application-identification application application-name],  
[edit services application-identification nested-application name]
```

Description

Define type of application, such as HTTP or FTP.

Options

type—Application type. This is a mandatory value and has a maximum length of 32 characters.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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[Application Identification for Nested Applications | 30](#)

type-of-service

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Syntax

```
type-of-service service-type;
```

Hierarchy Level

```
[edit services application-identification application application-name]
```

Description

Define the type of service by service objective. There is no default value.

Options

The following *service-type* options are available:

- `maximize-reliability`—Service designed for maximum reliability in packet transmission.
- `maximize-throughput`—Service designed for maximum throughput.
- `minimize-delay`—Service designed for minimum delay in packet transmission.
- `minimize-monetary-cost`—Service designed for minimum monetary cost.

Required Privilege Level

`interface`—To view this statement in the configuration.

`interface-control`—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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url

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Syntax

```
url url;
```

Hierarchy Level

```
[edit services application-identification download]
```

Description

Define the URL for application package downloads.

Options

url—Download URL.

Required Privilege Level

interface—To view this statement in the configuration.

interface-control—To add this statement to the configuration.

Release Information

Statement introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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5

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clear services application-aware-access-list statistics

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Syntax

```
clear services application-aware-access-list statistics
```

Description

Clear application-aware access list (AACL) statistics.

Options

This command has no options.

Required Privilege Level

clear

Release Information

Command introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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clear services application-identification application-system-cache

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Syntax

```
clear services application-identification application-system-cache
```

Description

Clear entries from application system cache.

Options

This command has no options.

Required Privilege Level

clear

Release Information

Command introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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clear services application-identification counter

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Syntax

```
clear services application-identification counter
```

Description

Clear application identification counters.

Options

This command has no options.

Required Privilege Level

clear

Release Information

Command introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

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clear services flows

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Syntax

```
clear services flows
<application-protocol protocol>
<destination-port destination-port>
<destination-prefix destination-prefix>
<interface interface-name>
<protocol protocol>
<service-set service-set>
<source-port source-port>
<source-prefix source-prefix>
```

Description

Clear flow session table entries.

Options

none

Clear all flows.

**application-
protocol *protocol***

(Optional) Clear flows for one of the following application protocols:

- bootp—Bootstrap protocol
- dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols
- dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service
- dns—Domain Name System protocol
- exec—Exec
- ftp—File Transfer Protocol
- h323—H.323 standards
- icmp—Internet Control Message Protocol
- iiop—Internet Inter-ORB Protocol
- login—Login
- netbios—NetBIOS
- netshow—NetShow
- pptp—Point-to-Point Tunneling Protocol
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- shell—Shell
- sip—Session Initiation Protocol
- snmp—Simple Network Management Protocol

- sqlnet—SQLNet
- talk—Talk Program
- tftp—Trivial File Transfer Protocol
- traceroute—Traceroute
- winframe—WinFrame

destination-port
destination-port (Optional) Clear flows for the specified destination port. The range of values is from 0 to 65535.

destination-prefix
destination-prefix (Optional) Clear flows for the specified destination prefix.

interface
interface-name (Optional) Clear flows for the specified interface. On M Series and T Series routers, the *interface-name* can be *ms-fpc/pic/port* or *rspnumber*. On J Series routers, the *interface-name* is *ms-pim/0/port*.

protocol *protocol* (Optional) Clear flows for one of the following IP types:

- *number*—Numeric protocol value from 0 to 255
- ah—IPsec Authentication Header protocol
- egp—An exterior gateway protocol
- esp—IPsec Encapsulating Security Payload protocol
- gre—A generic routing encapsulation protocol
- icmp—Internet Control Message Protocol
- icmp6—Internet Control Message Protocol version 6
- igmp—Internet Group Management Protocol
- ipip—IP-over-IP Encapsulation Protocol
- ospf—Open Shortest Path First protocol
- pim—Protocol Independent Multicast protocol
- rsvp—Resource Reservation Protocol
- sctp—Stream Control Transmission Protocol

- tcp—Transmission Control Protocol
- udp—User Datagram Protocol

service-set <i>service-set</i>	(Optional) Clear flows for the specified service set.
source-port <i>source-port</i>	(Optional) Clear flows for the specified source port. The range of values is from 0 through 65535.
source-prefix <i>source-prefix</i>	(Optional) Clear flows for the specified source prefix.

Required Privilege Level

clear

Output Fields

Table 1 on page 216 lists the output fields for the `clear services flows` command. Output fields are listed in the approximate order in which they appear.

Table 1: clear services flows Output Fields

Field Name	Field Description
Interface	Name of an interface.
Service set	Name of the service set from which flows are being cleared.
Flows removed	Number of flows removed.

Sample Output

clear services flows

```
user@host> clear services flows
Interface  Service set  Flows removed
ms-2/0/0   IDP          1
```

clear services flows ip-action

```
user@host> clear services flows ip-action
Interface  Service set  Flows removed
ms-4/0/0   idp-service  1
```

Release Information

Command introduced in Junos OS Release 9.5.

application-protocol option introduced in Junos OS Release 11.1.

RELATED DOCUMENTATION

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clear services local-policy-decision-function statistics

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Syntax

```
clear services local-policy-decision-function statistics
```

Description

Clear local policy decision function (L-PDF) statistics.

Options

This command has no options.

Required Privilege Level

view

Release Information

Command introduced in Junos OS Release 9.5.

RELATED DOCUMENTATION

| [show services local-policy-decision-function statistics](#) | 280

request services application-identification application

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Syntax

```
request services application-identification application [disable | enable] predefined-  
application-name
```

Description

Disable, or enable a predefined application signature.

Options

disable—(Optional) Disable a predefined application signature, initiate signature recompilation, and commit all pending uncompiled signatures to the configuration.

The following conditions apply:

- You cannot disable a predefined application signature that is referenced by an active security policy or custom application signature. First modify or deactivate the policy or custom application signature.
- If you disable an application signature, for example, `junos:HTTP`, that has nested applications, the nested applications are not recognized.

enable—(Optional) Enable a predefined application signature, initiate signature recompilation, and commit all pending uncompiled signatures to the configuration.

Required Privilege Level

maintenance

Output Fields

When you enter this command, the system provides feedback on the status of your request.

Sample Output

request services application-identification application disable

```
user@host> request services application-identification application disable junos:163
```

```
Please wait while we are updating signatures ...
Please wait while we are updating signatures ...
Please wait while we are updating signatures ...
Please wait while we are updating signatures ...
Please wait while we are updating signatures ...
```

```
Please wait while we are updating signatures ...  
Disable application junos:163 succeed.
```

Release Information

Command introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

| *show services application-identification application*

request services application-identification download

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Syntax

```
request services application-identification download  
<check-server>  
<status>  
<version>
```

Description

Manually download the application signature package for Junos OS application identification. The application package is extracted from the IDP signature database and contains signature definitions for known applications, such as: DNS, Facebook, FTP, Skype, and SNMP.

Options

- `check-server` —Display the details of the download server URL.
- `status`—Check the download status of the application signature package. The downloaded application package is saved under `/var/db/appid/sec-download/`.
- `version`—(Optional) Download a specific version of the application package from the Juniper Networks security website. If you do not enter a version, the most recent version is downloaded.

Required Privilege Level

maintenance

Output Fields

When you enter this command, you are provided feedback on the status of your request.

Sample Output

request services application-identification download

```
user@host> request services application-identifications download
Please use command "request services application-identification download status"
to check status
```

request services application-identification download status

```
user@host> request services application-identifications download status
Application package 1608 is downloaded successfully.
```

request services application-identification check-server

```
user@host> request services application-identifications download check-server
Download server URL: https://signatures.juniper.net/cgi-bin/index.cgi
Sigpack Version: 3377
Protobundle version: 1.500.2-31
Build Time: Apr 05 2021 13:57:06
```

NOTE: We recommend not to use the request services application-identification download check-server command when running the following commands:

request services application-identification download

request services application-identification install

Following messages are displayed in such cases:

```
user@host> request services application-identifications download check-server
Currently "download" command is running, please try again later.
```

```
user@host> request services application-identifications download check-server
Currently "install" command is running, please try again later.
```

Release Information

Statement introduced in Junos OS Release 10.2.

RELATED DOCUMENTATION

request services application-identification download status

request services application-identification install

request services application-identification download status

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- [Description | 224](#)
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- [Sample Output | 225](#)
- [Release Information | 225](#)

Syntax

```
request services application-identification download status
```

Description

Check the download status of the application signature package. The downloaded application package is saved under **/var/db/appid/sec-download/**.

Required Privilege Level

maintenance

Output Fields

When you enter this command, the system provides feedback on the status of your request.

Sample Output

request services application-identification download status

```
user@host> request services application-identifications download status
Application package 1608 is downloaded successfully.
```

Release Information

Statement introduced in Junos OS Release 10.2.

Statement modified in Junos OS Release 11.4.

RELATED DOCUMENTATION

| *request services application-identification download*

request services application-identification group

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- [Description | 226](#)
- [Options | 226](#)
- [Required Privilege Level | 227](#)

- [Output Fields | 227](#)
- [Sample Output | 227](#)
- [Release Information | 228](#)

Syntax

```
request services application-identification group [copy | disable | enable] predefined-
application-group-name
```

Description

Copy, disable, or enable a predefined application signature group.

Options

copy (Optional) Copy a predefined application signature group from the database to the configuration and change the name (for example, my:FTP). The ID and order are generated automatically. Do not name your custom application signature group with the `junos` prefix; this prefix is reserved for predefined application signature groups. You can copy the same predefined application signature group only once; duplicate custom signature groups are not allowed.

NOTE: In configuration mode, if an uncommitted action is pending, the `request services application-identification group copy` command fails.

disable (Optional) Disable a predefined application signature group.

NOTE: You cannot disable a predefined application signature group that is referenced by an active security policy or custom application signature group. First modify or deactivate the policy or custom application signature group.

enable (Optional) Enable a predefined application signature group.

predefined-application-group-name Name of the predefined application signature group.

Required Privilege Level

maintenance

Output Fields

When you enter this command, the system provides feedback on the status of your request.

Sample Output

request services application-identification group

```
user@host> request services application-identification group disable
junos:infrastructure:networking
Disable application group junos:infrastructure:networking succeed.
```

request services application-identification group

```
user@host> request services application-identification group enable
junos:infrastructure:networking
Enable application group junos:infrastructure:networking succeed.
```

request services application-identification group

```
user@host> request services application-identification group copy
junos:infrastructure:networking
Please wait while we are copying group ...
Copy application group junos:infrastructure:networking succeed.
```

Release Information

Command introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

| *show services application-identification group*

request services application-identification install

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- [Description | 229](#)
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Syntax

```
request services application-identification install
```

Description

Install the downloaded predefined application signature package.

Required Privilege Level

maintenance

Output Fields

When you enter this command, the system provides feedback on the status of your request.

Sample Output

command-name

```
user@host> request services application-identification install
Please use command "request services application-identification install status" to check status
and use command "request services application-identification proto-bundle-status" to check
protocol bundle status
```

Release Information

Statement introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

request services application-identification install status

request services application-identification download

request services application-identification install status

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- [Description | 230](#)
- [Required Privilege Level | 230](#)
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Syntax

```
request services application-identification install status
```

Description

Display the status of the install operation.

Required Privilege Level

maintenance

Output Fields

When you enter this command, the system provides feedback on the status of your request.

Sample Output

command-name

```
user@host> request services application-identification install status
Install application package version (1776) succeed.
```

Release Information

Statement introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

| *request services application-identification install*

show services application-aware-access-list flows

IN THIS SECTION

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- [Description | 232](#)
- [Options | 232](#)
- [Required Privilege Level | 232](#)
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Syntax

```
show services application-aware-access-list flows
<interface interface-name>
<subscriber subscriber-name>
```

Description

Display application-aware-access-list (AACL) flows. Offloading using JFM is supported only on MX Series routers with Modular Port Concentrators (MPCs).

Options

<code>interface <i>interface-name</i></code>	Displays AACL flows for the specified interfaces only. The keyword, interface, must be appended to the command.
<code>subscriber <i>subscriber-name</i></code>	Displays AACL flows for the specified subscribers only. The keyword, subscriber, must be appended to the command.

Required Privilege Level

view

Output Fields

Table 2 on page 233 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 2: show services application-aware-access-list flows Output Fields

Field Name	Field Description	Level of Output
5-tuple	<p>This field comprises five components of the given flow. The components are:</p> <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	<p>The direction in terms of input or output.</p> <ul style="list-style-type: none"> • Input (I) • Output (O) 	All levels
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

Table 2: 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 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 interface

```

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

```

High watermark flows: 2

5-tuple	Application-ID	Dir	Off	Action
198.51.100.2:47072-> 10.10.254.116:80 ,6	junos:http [64]	I	-	C-T
10.10.254.116:80 -> 198.51.100.2:47072,6	junos:http [64]	O	-	C-T

show services application-aware-access-list flows subscriber

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

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

5-tuple	Application-ID	Dir	Off	Action
192.0.2.100:20109->160.200.200.200:80,17	junos:http [64]	I	-	C-T+FC+P
203.0.113.200:80->192.0.2.100:20109,17	junos:http [64]	O	-	C-T+FC+P
192.0.2.100:20108->203.0.113.100:80,17	junos:http [64]	I	P+F	C-T+FC+P
203.0.113.100:80->192.0.2.100:20108,17	junos:http [64]	O	P+F	C-T+FC
+P				

show services application-aware-access-list flows subscriber (Offloading Using JFM)

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

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

5-tuple	Application-ID	Dir	Off	Action
---------	----------------	-----	-----	--------

192.0.2.100:20109->160.200.200.200:80,17	junos:http [64]	I	-	C-T+FC+P
203.0.113.200:80	->192.0.2.100:20109,17	0	-	C-T+FC+P
192.0.2.100:20108->203.0.113.100:80,17	junos:http [64]	I	R	C-T+FC+P
203.0.113.100:80	->192.0.2.100:20108,17	0	0	C-T+FC+P

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.

RELATED DOCUMENTATION

[Application Aware Services Interfaces User Guide for Routing Devices](#)

show services application-aware-access-list statistics

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Syntax

```
show services application-aware-access-list statistics
<interface interface-name>
<subscriber subscriber-name>
```

Description

Display application-aware access list (AACL) statistics.

Options

`interface interface-name` (Optional) Display AACL statistics for the specified interface only.

`subscriber subscriber-name` (Optional) Display AACL statistics for the specified subscriber only.

Required Privilege Level

view

Output Fields

[Table 3 on page 237](#) 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

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

Field Name	Field Description	Level of Output
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 interface

```

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

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

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

```

6	346
---	-----

show services application-aware-access-list statistics subscriber

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

Service-set-interface: ms-1/3/0
Service set: aacl-svc-set

Application-aware-access-list statistics

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

Release Information

Command introduced in Junos OS Release 9.5.

show services application-identification application

IN THIS SECTION

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Syntax

```
show services application-identification application (detail | summary)
```

Description

Display detailed information about a specified application signature, detailed information about all application signatures, or a summary of the existing application signatures.

Options

- | | |
|----------------|--|
| detail | Display detailed information for all application signatures. |
| summary | Display summary information for all application signatures. |

Required Privilege Level

view

Output Fields

[Table 4 on page 241](#) shows the output details for the `show services application-identification application detail` command.

Table 4: show services application-identification application summary Output Fields

Field Name	Field Description
Application(s)	The number of applications present.
Application	Name of the custom application.
Disabled	The status of the application and whether the mapping method is currently used to identify this application.
ID	The unique ID number of an application. ID numbers 1 through 32,767 are automatically generated for applications; these IDs do not change. ID numbers for custom applications use 16,777,216 to 33,554,431.
Order	Number used to specify priority when multiple applications match the traffic. The lowest order number takes the highest priority.

[show services application-identification application Output Fields on page 241](#) lists the output fields for the `show services application-identification application` command. Output fields are listed in the approximate order in which they appear.

Table 5: show services application-identification application Output Fields

Field Name	Field Description
Application Name	Name of the application.
Application Type	The basic application type, such as HTTP.
Description	A description of the application.

Table 5: show services application-identification application Output Fields (Continued)

Field Name	Field Description
Application ID	<p>The unique ID number of an application signature. ID numbers 1 through 32,767 are automatically generated for application; these IDs do not change.</p> <p>ID numbers for custom applications use 16,777,216 to 33,554,431.</p>
Priority	Priority over other signature applications.
Order	
Disabled	<p>The status of the application and whether the mapping method is currently used to identify this application.</p>
Cacheable	<p>The status whether the application identification results caching is enabled or not for the application.</p> <p>When this option is enabled, you can cache the application detection result in an ASC table.</p>
Configurable	The status whether application is configurable or not.
Activation Date	Date when the application was activated for the first time.
Last Modified	Date when the application was last updated.
Number of Parent Group(s)	Total number of parent groups in this application signature group or cluster.
Underlying consolidated Protocols/ports application is dependent on	<p>List of default protocols and ports for dependent applications of the specified application.</p> <ul style="list-style-type: none"> • Protocols—List of default protocols. • TCP ports—List of default TCP ports.
Layer-7 Immediate Protocol(s)	List of applications over which that dynamic application can be identified.

Table 5: show services application-identification application Output Fields (Continued)

Field Name	Field Description
Application Specific Ports:	The default port for this application type.
Signature:	Signature mapping criteria for application identification
Protocol	Application protocol
Port range	Port range. This option is applicable for TCP or UDP-based applications only.
Member(s)	<p>Member name for a custom application signature.</p> <ul style="list-style-type: none"> • Depth–Maximum number of bytes to check for context match. Byte limit for AppID to identify custom application pattern for applications running over TCP or UDP or Layer 7 applications. • Context–Service-specific context, such as http-header-content-type. • Pattern–Deterministic finite automaton (DFA) pattern matched on the context. The DFA pattern specifies the pattern to be matched for the signature. • Direction–Connection direction of the packets to match pattern (example : CTS [client-to-server])
Number of Parent Group	Number of parents application groups.
Application Groups	Application groups names.
Application tags	Application tag groups created to group related applications based on the attributes.
group-tags	Name of the tag group
characteristic	characteristic of application
risk	Associated risk
subcategory	Subcategory of the application

Table 5: show services application-identification application Output Fields (*Continued*)

Field Name	Field Description
category	Category of the application.
Attribute	Attribute of the application. Shows Obsolete for the deprecated application

Sample Output

show services application-identification application summary

```

user@host> show services application-identification application summary
Application(s): 3616
Applications           Disabled      ID      Order
junos:SLACKER          No           1179    1
junos:GOOGLE-TRUSTED-STORE No           2819    5
junos:AMJILT           No           2272    4
junos:DSI              No           2644    3
junos:HLN              No           2096    2
junos:ETSI-LI          No           537     1
junos:CRAZYSALOON      No           1720    5
junos:EKSISOZLUK       No           2436    4
junos:SABAH            No           2574    3
junos:AFREECA          No           2373    2
junos:SENEWEB          No           2068    1
junos:DIINO            No           776     5
junos:CARE2            No           376     4
junos:MOBAGE           No           1456    3
junos:CARTOONNETWORK   No           982     2
junos:AVATARS-UNITED   No           363     1
junos:CONVIVA          No           2015    5
junos:DREAMORA         No           1725    4
junos:ELWATANNEWS      No           2381    3
junos:REUTERS          No           1044    2
junos:BABYCENTER       No           364     1

```

junos:SOUTHWEST	No	289	5
junos:ONEDIO	No	2517	4
.....			
.....			

show services application-identification application detail

```

user@host> show services application-identification application detail junos:FTP

Application Name: junos:FTP
Application type: FTP
Description: This signature detects the File Transfer Protocol (FTP), which provides facilities
for transferring files to and from remote computer systems. It usually runs on TCP port 21.
Application ID: 45
Priority: high
Order: 0
Disabled: Yes
Cacheable: Yes
Activation Date: 2003-05-05
Last Modified: 2016-04-11
Number of Parent Group(s): 1
Application Groups:
    junos:infrastructure:file-servers
Application Tags:
    characteristic      : Supports File Transfer
    characteristic      : Known Vulnerabilities
    characteristic      : Capable of Tunneling
    risk                : 3
    subcategory         : File-Servers
    category            : Infrastructure
Layer-7 Protocol(s):
    Protocol: TCP        / 205
    Protocol: SPDY       / 1469
    Protocol: SOCKS5     / 193
    Protocol: SOCKS4     / 192
    Protocol: HTTPS      / 68
    Protocol: HTTP2      / 2553
    Protocol: HTTP       / 67
Port Mapping:

```

Default ports: TCP/21

show services application-identification application detail (Custom Applications)

```
user@host> show services application-identification application detail my-custom-app
```

```
Application Name: my-custom-app
Application type: MY-CUSTOM-APP
Description: custom App
Application ID: 16777216
Priority: high
Order: 65500
Disabled: No
Cacheable: No
Activation Date: N/A
Last Modified: N/A
Layer-7 Protocol(s):
  Protocol: http      / http
  Port range: N/A
  Member(s): 1
    Member m01
      Context: http-header-host
      Pattern: MY-SERVER.COM
      Direction: CTS
```

Sample Output

show services application-identification application detail (Unified Policies)

```
user@host> show services application-identification application detail
```

```
Application Name: junos:GOOGLE
Application type: GOOGLE
Description: This signature detects SSL connections to Google.com. Google is a
             company best known for their search engine but offers many cloud
```

based services.

Application ID: 54

Priority: high

Order: 0

Disabled: No

Cacheable: No

Activation Date: 2003-05-05

Last Modified: 2017-06-28

Number of Parent Group(s): 2

Application Groups:

junos:web:applications

junos:web:portal

Application Tags:

characteristic : Can Leak Information

characteristic : Loss of Productivity

characteristic : Supports File Transfer

risk : 3

subcategory : Applications

category : Web

Underlying consolidated Protocols/ports application is dependent on:

Protocols:

Protocol: junos:GOOGLE-GEN / 943

Protocol: junos:STUN / 201

Protocol: junos:UDP / 216

Protocol: junos:TCP / 205

Protocol: junos:HTTP-PROXY / 2956

Protocol: junos:SSL / 199

Protocol: junos:SPDY / 1469

Protocol: junos:POSTGRESQL / 150

Protocol: junos:HTTPS / 68

Protocol: junos:HTTP / 67

Protocol: junos:NET-PROXY / 2629

Protocol: junos:HTTP2 / 2553

Protocol: junos:HTTP-TUNNEL / 750

Protocol: junos:COTP / 22

Protocol: junos:RTSP / 176

Protocol: junos:RTP / 175

Protocol: junos:DTLS / 1291

Protocol: junos:RTMP / 337

Protocol: junos:QUIC / 2521

Protocol: junos:JABBER / 94

TCP Ports:

Port: 443


```

    Port: 554
    Port: 80
  UDP Ports:
    Port: 554
  Layer-7 Immediate Protocol(s):
    Protocol: GOOGLE-GEN / 943
  Alias List:
    junos:GOOGLE-SSL
  Application Specific Ports:
    Default ports: N/A
  Signature:
    Port range: N/A
    Client-to-server
    Order: 1

```

show services application-identification application detail (Junos OS Release 20.2R1)

```

user@host> show services application-identification application detail
Application Name: test
Application type: TEST
Description: N/A
Application ID: 16777221
Priority: high
Order: 65500
Disabled: No
Cacheable: No
Activation Date: N/A
Last Modified: N/A
Underlying consolidated Protocols/ports application is dependent on:
  Protocols:
    Protocol: junos:HTTP / 67
    Protocol: junos:UDP / 216
    Protocol: junos:TCP / 205
    Protocol: junos:NET-PROXY / 2629
    Protocol: junos:SPDY / 1469
    Protocol: junos:SSL / 199
    Protocol: junos:LIBJINGLE-PSEUDOTCP / 3237
    Protocol: junos:STUN / 201
    Protocol: junos:HTTPS / 68

```

```

    Protocol: junos:HTTP / 67
    Protocol: junos:HTTP2 / 2553
    Protocol: junos:HTTP-TUNNEL / 750
    Protocol: junos:HTTP-PROXY / 2956
    Protocol: junos:HAPROXY / 3331
    Protocol: junos:COTP / 22
TCP Ports:
    Port: 80
    Port: 3128
    Port: 8000
    Port: 8080
Layer-7 Immediate Protocol(s):
    Protocol: HTTP / 67
    Signature: fgnm
    Port range: N/A
    Member(s): 1
        Member m01
            Depth: 4
            Context: http-get-url-parsed-param-parsed
            Pattern: ads
            Direction: CTS

```

Sample Output

show services application-identification application detail (Junos OS Release 20.3 R1)

```

user@host> show services application-identification application detail junos:PDF
Application Name: junos:PDF
Application type: PDF
Description: This signature detects the download of PDF documents.
Application ID: 11046
Priority: high
Order: 0
Disabled: No
Cacheable: Yes
Configurable: No
Activation Date: 1999-12-31
Last Modified: 2019-12-31
Application Tags:

```

```

characteristic      : Known Vulnerabilities
characteristic      : Carrier of Malware
characteristic      : Bandwidth Consumer
risk                : 4
subcategory         : Multimedia
category           : Web

```

Layer-7 Immediate Protocol(s):

```

Protocol: SPDY      / 1469
Protocol: HTTPS     / 68
Protocol: HTTP2     / 2553
Protocol: HTTP      / 67

```

Application Specific Ports:

Default ports: N/A

Signature:

```

Port range: N/A
Client-to-server
Order: 3

```

show services application-identification application detail junos:DNS-ENCRYPTED

```
user@host> show services application-identification application detail junos:DNS-ENCRYPTED
```

```

Application Name: junos:DNS-ENCRYPTED
Application type: DNS-ENCRYPTED
Description: This application is used to represent DNS Queries over HTTPS (DoH) and DNS over
Transport Layer Security (TLS)
Application ID: 33554507
Priority: high
Order: 0
Disabled: No
Cacheable: Yes
Configurable: Yes
Activation Date: N/A
Last Modified: N/A
Number of Parent Group(s): 1
Application Groups:
    junos:unassigned
Application Tags:
    risk                : 4
    subcategory         : Networking

```

```

category                : Infrastructure
Underlying consolidated Protocols/ports application is dependent on:
  Protocols:
    Protocol: junos:SSL    / 199
    Protocol: junos:TCP    / 205
    Protocol: junos:SPDY   / 1469
    Protocol: junos:LIBJINGLE-PSEUDOTCP / 3237
    Protocol: junos:UDP    / 216
    Protocol: junos:STUN   / 201
    Protocol: junos:HTTP-PROXY / 2956
    Protocol: junos:HTTPS  / 68
    Protocol: junos:HTTP   / 67
    Protocol: junos:NET-PROXY / 2629
    Protocol: junos:HTTP2  / 2553
    Protocol: junos:HTTP-TUNNEL / 750
    Protocol: junos:HAPROXY / 3331
    Protocol: junos:COTP   / 22
  TCP Ports:
    Port: 853
    Port: 443
Layer-7 Immediate Protocol(s):
  Protocol: SSL           / 199

```

show services application-identification application detail junos:RLOGIN (Junos OS Release 21.1R1)

```

Application Name: junos:RLOGIN
Application type: RLOGIN
Description: This signature detects RLOGIN, a remote access protocol.
Application ID: 165
Priority: high
Order: 0
Disabled: No
Cacheable: Yes
Configurable: Yes
Activation Date: 2003-05-05
Last Modified: 2017-01-25
Number of Parent Group(s): 2
Application Groups:
  junos:all-new-apps
  junos:remote-access:command

```

Application Tags:

```

group-tags      : new-app
group-tags      : standardized
group-tags      : remote_access
group-tags      : enterprise
characteristic   : Known Vulnerabilities
risk            : 1
subcategory     : Command
category        : Remote-Access

```

show services application-identification application detail junos:MXIT (Junos OS Release 21.1R1)

```

Application Name: junos:MXIT
Application type: MXIT
Description: This protocol plug-in is deprecated.
Application ID: 535
Priority: high
Order: 0
Disabled: No
Cacheable: Yes
Configurable: Yes
Activation Date: 2010-08-06
Last Modified: 2010-10-01
Number of Parent Group(s): 1
Application Groups:
junos:web:messaging:instant-messaging
Application Tags:
characteristic : Loss of Productivity
characteristic : Bandwidth Consumer
risk : 2
subcategory : Messaging
category : Web
attribute : Obsolete
Alias List:
junos:MXIT-TCP
Application Specific Ports:
Default ports: N/A
Signature:
Port range: N/A

```

Client-to-server
Order: 3

Release Information

Command introduced in Junos OS Release 11.4.

Starting in Junos OS Release 15.1X49-D100, the options `Cacheable`, `Activation Date`, and `Last modified` are introduced for `show services application-identification application detail` command.

The Underlying consolidated Protocols/ports application is dependent on and Layer-7 Immediate Protocol(s) options are introduced in Junos OS Release 18.2R1.

RELATED DOCUMENTATION

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show services application-identification application-system-cache

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Syntax

```
show services application-identification application-system-cache
<interface interface-name>
```

Description

Display the database of cached values stored by the application identification (APPID) system.

NOTE: The `show services application-identification application-system-cache` command gives the information only when the application identifier (AI) is matched with the signature.

Options

`interface interface-name` Display the specified services interfaces to query.

Required Privilege Level

view

Output Fields

[Table 6 on page 255](#) lists the output fields for the `show services application-identification application-system-cache` command. Output fields are listed in the approximate order in which they appear.

Table 6: show services application-identification application-system-cache Output Fields

Field Name	Field Description	Level of Output
IP address	IP address.	All levels
Port	Port number.	All levels
Protocol	Protocol name.	All levels
Application	Application number.	All levels
CPU	CPU number	All levels

Sample Output

show services application-identification application-system-cache

```
user@host> show services application-identification application-system-cache interface ms-1/0/0
pic: 2/0
```

IP address	Port	Protocol	Application	CPU
10.1.1.2	81	TCP	63	18

Release Information

Command introduced in Junos OS Release 9.5.

interface option added in Junos OS Release 10.1.

show services application-identification counter

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Syntax

```
show services application-identification counter  
<interface interface-name>
```

Description

Display application identification (APPID) counter statistics.

Options

<code>interface <i>interface-name</i></code>	Display the specified services interfaces to query.
--	---

Required Privilege Level

view

Output Fields

[Table 7 on page 257](#) lists the output fields for the `show services application-identification counter` command. Output fields are listed in the approximate order in which they appear.

Table 7: show services application-identification counter Output Fields

Field Name	Field Description
pic	PIC number.
Total sessions	Total number of sessions.
Total identified sessions	Total number of identified sessions.
Total unidentified sessions	Total number of unidentified sessions.
Total identified-by-address sessions	Number of sessions identified by address.
Total unidentified-by-address sessions	Number of sessions not identified by address.
Total identified-by-port sessions	Number of sessions identified by port.
Total unidentified-by-port sessions	Number of sessions not identified by port.
Total identified-by-icmp sessions	Number of sessions identified by ICMP.
Total unidentified-by-icmp sessions	Number of sessions not identified by ICMP.

Table 7: show services application-identification counter Output Fields (Continued)

Field Name	Field Description
Total identified-by-ip-protocol sessions	Number of sessions identified by IP protocol.
Total unidentified-by-ip-protocol sessions	Number of sessions not identified by IP protocol.
Total identified-by-signature sessions	Number of sessions identified by signature.
Total unidentified-by-signature sessions	Number of sessions not identified by signature.
Total unspecified encrypted sessions	Number of encrypted sessions not specified by normal processes.
Total encrypted P2P sessions	Number of encrypted point-to-point sessions.
Total application system cache hits	Number of sessions found in the application system cache.
Total application system cache misses	Number of sessions not found in the application system cache.
Total identified-by-protocol sessions	Number of sessions identified by protocol.
Total unidentified-by-protocol sessions	Number of sessions not identified by protocol.

Sample Output

show services application-identification counter

```

user@host> show services application-identification counter interface ms-1/0/0
Counter Statistics:
  pic: 1/1
  Total sessions: 11
  Total identified sessions: 11

```

```

    Total un-identified sessions: 0
Address Method
    Total identified-by-address sessions: 0
    Total un-identified-by-address sessions: 11
Port Method
    Total identified-by-port sessions: 1
    Total un-identified-by-port sessions: 0
    Total identified-by-icmp sessions: 0
    Total un-identified-by-icmp sessions: 0
    Total identified-by-ip-protocol sessions: 0
    Total un-identified-by-ip-protocol sessions: 0
Signature Method
    Total identified-by-signature sessions: 11
    Total un-identified-by-signature sessions: 0
    Total unspecified encrypted sessions: 2
    Total encrypted P2P sessions: 2
    Total application system cache hits: 10
    Total application system cache misses: 1
Protocol Method
    Total identified-by-protocol sessions: 0
    Total un-identified-by-protocol sessions: 0

```

show services application-identification counter

```

user@host> show services application-identification counter interface ams0
Counter Statistics:
    pic: ams0
    Total sessions: 20
    Total identified sessions: 20
    Total un-identified sessions: 0
Protocol Method
    Total identified-by-protocol sessions: 0
    Total un-identified-by-protocol sessions: 0
Address Method
    Total identified-by-address sessions: 0
    Total un-identified-by-address sessions: 0
Port Method
    Total identified-by-port sessions: 0
    Total un-identified-by-port sessions: 0
    Total identified-by-icmp sessions: 0
    Total un-identified-by-icmp sessions: 0

```

```

Total identified-by-ip-protocol sessions: 0
Total un-identified-by-ip-protocol sessions: 0
Signature Method
Total identified-by-signature sessions: 20
Total identified-by-signature uni-directional sessions: 0
Total un-identified-by-signature sessions: 0
Total application system cache hits: 0
Total application system cache misses: 0

```

Release Information

Command introduced in Junos OS Release 9.5.

`interface` option added in Junos OS Release 10.1.

show services application-identification group

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- [Release Information | 265](#)

Syntax

```
show services application-identification group [detail application-group name | summary]
```

Description

Display detailed or summary information about a specified application signature group or all application signature groups. Both custom and predefined application signature groups can be displayed.

Options

<code>detail <i>application-group name</i></code>	(Optional) Display detailed information for the specified application signature group.
<code>summary</code>	(Optional) Display summary information for all application signature groups.

Required Privilege Level

view

Output Fields

[Table 8 on page 261](#) lists the output fields for the `show services application-identification group` command. Output fields are listed in the approximate order in which they appear.

Table 8: show services application-identification group Output Fields

Field Name	Field Description
Description	Description of the specified application in the detailed display.
Group ID or ID	The unique ID number of an application signature or application signature group. ID numbers 1 through 32,767 are automatically generated for predefined application signatures and application signature groups; these IDs do not change. ID numbers for custom application signatures and application signature groups use ID numbers 32,768 to 65,534.

Table 8: show services application-identification group Output Fields (Continued)

Field Name	Field Description
Disabled	The status of the application signature group and whether the signature method is currently used to identify this application. The default is No.
Application Group(s)	The application signature groups present.
Applications	The application signatures associated with this application signature group.
Number of Applications	Number of applications in the group
Number of Sub-Groups	Number of subgroups belonging to the application group.
Number of Parent-Groups	Number of parent group in the application group.
Tag Group	Tag group created to group applications based on the application attributes.
Tag group applications:	The application signatures associated with the tag group.

Sample Output

show services application-identification group summary

```
user@host> show services application-identification group summary
```

```
Application Group(s): 24
```

Application Groups	Disabled	ID
my:enterprise	No	32770
junos:enterprise:voip	No	25
junos:peer-to-peer:voip	No	24
junos:peer-to-peer:chat	No	23
junos:peer-to-peer:file-sharing	No	22
...		

show services application-identification group detail

```

user@host> show services application-identification group detail junos:social-networking
Group Name: junos:social-networking
Group ID: 36
Description: N/A
Disabled: No
Number of Applications: 0
Number of Sub-Groups: 2
Number of Parent-Groups: 1
Sub Groups:
    junos:social-networking:applications
    junos:social-networking:business

```

show services application-identification group detail (Junos OS 21.1R1)

```

user@host> show services application-identification group detail junos:all-new-apps
    junos:all-new-apps
Group Name: junos:all-new-apps
Group ID: 32766
Description: N/A
Disabled: No
Number of Applications: 77
Number of Sub-Groups: 0
Number of Parent-Groups: 1
Applications:
    junos:RLOGIN
    junos:LINKEDIN

```

show services application-identification group detail (Junos OS 21.1)

```

user@host> show services application-identification group detail remote_acc_web_tags
Group Name: remote_acc_web_tags
Group ID: 32770
Description: N/A
Disabled: No
Number of Applications: 75
Number of Sub-Groups: 0
Number of Parent-Groups: 0

```



```

Tag Group: tg2
  Applications Tags:
    social_network
Tag Group: tg1
  Applications Tags:
    web
    remote_access
Tag group applications:
  junos:FLIPBOARD
  junos:GATHER
  junos:FLICKR
  junos:YAMMER
  junos:TWITCH-VIDEO-STREAM
  junos:IMVU
  junos:FACEBOOK-APP
  junos:BEBO
  junos:ORKUT
  junos:SLIDESHARE
  junos:FACEBOOK-ACCESS
  junos:FUBAR
  junos:ATHLINKS
  junos:GOOGLE-PLUS
  junos:REDDIT
  junos:CLOOB
  junos:VIADEO-COOKIE
  junos:MYSPACE

```

show services application-identification group summary (Junos OS Release 21.1)

```

user@host> show services application-identification group summary
  Application Group(s): 92
Application Groups                                Disabled  ID
MY-GROUP                                           No        32780
junos:all-new-apps                                No        32766
junos:behavioral                                   No        94
junos:unassigned                                  No        89
junos:web:proxy                                    No        48
junos:remote-access:interactive-desktop           No        34
(.....)

```

Release Information

Command introduced in Junos OS Release 11.4.

RELATED DOCUMENTATION

Predefined Application Signatures for Application Identification

show services application-identification version

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- [Syntax | 265](#)
- [Description | 265](#)
- [Required Privilege Level | 266](#)
- [Sample Output | 266](#)
- [Release Information | 266](#)

Syntax

```
show services application-identification version
```

Description

Displays the application signature package version installed on your security device.

Required Privilege Level

view

Sample Output

show services application-identification version

The following output shows that the application package version is 1608.

```
user@host> show services application-identification version
Application package version: 1608
```

show services application-identification version (Logical Systems)

The following output shows that the application package version is 534.

```
user@host> show services application-identification version
Application package version: 534
```

show services application-identification version (Junos OS Release 21.1R1)

The following output shows that the application package version is 3345 and release date as 12th January, 2021.

```
user@host> show services application-identification version
Application package version: 3345
Release date: Tue Jan 12 14:56:26 2021 UTC
```

Release Information

Command introduced in Junos OS Release 10.2.

show services flows

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Syntax

```
show services flows
<all | brief | extensive | terse>
<application-protocol protocol>
<count>
<destination-port destination-port>
<destination-prefix destination-prefix>
<interface interface-name>
<limit number>
<protocol protocol>
<service-set service-set>
<source-port source-port>
<source-prefix source-prefix>
```

Description

Display flow session table entries.

Options

none	Display standard information about all flows.
all brief extensive terse	(Optional) Display the specified level of output.
application-protocol <i>protocol</i>	<p>(Optional) Display information about one of the following application protocols:</p> <ul style="list-style-type: none"> • bootp—Bootstrap protocol • dce-rpc—Distributed Computing Environment-Remote Procedure Call protocols • dce-rpc-portmap—Distributed Computing Environment-Remote Procedure Call protocols portmap service • dns—Domain Name System protocol • exec—Exec • ftp—File Transfer Protocol • h323—H.323 standards • icmp—Internet Control Message Protocol • iiop—Internet Inter-ORB Protocol • login—Login • netbios—NetBIOS • netshow—NetShow • pptp—Point-to-Point Tunneling Protocol • realaudio—RealAudio • rpc—Remote Procedure Call protocol • rpc-portmap—Remote Procedure Call protocol portmap service • rtsp—Real-Time Streaming Protocol • shell—Shell • sip—Session Initiation Protocol

- `snmp`—Simple Network Management Protocol
- `sqlnet`—SQLNet
- `talk`—Talk Program
- `tftp`—Trivial File Transfer Protocol
- `traceroute`—Traceroute
- `winframe`—WinFrame

NOTE: The flows for the DCE RPC ALG match the flows for the DCE RPC Portmap ALG. The flows for the RPC ALG match the flows for the RPC Portmap ALG.

count	(Optional) Display a count of the matching entries.
destination-port <i>destination-port</i>	(Optional) Display information for the specified destination port. The range of values is from 0 to 65535.
destination-prefix <i>destination-prefix</i>	(Optional) Display information for the specified destination prefix.
interface <i>interface-name</i>	(Optional) Display information about the specified interface. On M Series and T Series routers, <i>interface-name</i> can be <i>ms-fpc/pic/port</i> or <i>rspnumber</i> .
limit <i>number</i>	(Optional) Maximum number of entries to display.
protocol <i>protocol</i>	(Optional) Display information about one of the following IP types: <ul style="list-style-type: none"> • <i>number</i>—Numeric protocol value from 0 to 255 • <code>ah</code>—IPsec Authentication Header protocol • <code>egp</code>—An exterior gateway protocol • <code>esp</code>—IPsec Encapsulating Security Payload protocol • <code>gre</code>—A generic routing encapsulation protocol • <code>icmp</code>—Internet Control Message Protocol • <code>icmp6</code>—Internet Control Message Protocol version 6

- `igmp`—Internet Group Management Protocol
- `ipip`—IP-within-IP Encapsulation Protocol
- `ospf`—Open Shortest Path First protocol
- `pim`—Protocol Independent Multicast protocol
- `rsvp`—Resource Reservation Protocol
- `sctp`—Stream Control Transmission Protocol
- `tcp`—Transmission Control Protocol
- `udp`—User Datagram Protocol

<code>service-set</code> <i>service-set</i>	(Optional) Display information for the specified service set.
<code>source-port</code> <i>source-port</i>	(Optional) Display information for the specified source port. The range of values is from 0 to 65535.
<code>source-prefix</code> <i>source-prefix</i>	(Optional) Display information for the specified source prefix.

Required Privilege Level

view

Output Fields

Table 9 on page 270 lists the output fields for the `show services flows` command. Output fields are listed in the approximate order in which they appear.

Table 9: `show services flows` Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface.	All levels

Table 9: show services flows Output Fields (Continued)

Field Name	Field Description	Level of Output
Service set	Name of a service set. Individual empty service sets are not displayed. If no service set has any flows, a flow table header is displayed for each service set.	All levels
Flow Count	Number of flows in a session.	count only
Flow or Flow Prot	Protocol used for this flow.	All levels
Source	Source prefix of the flow in the format <i>source-prefix:port</i> . For ICMP flows, port information is not displayed.	All levels
Dest	Destination prefix of the flow. For ICMP flows, port information is not displayed.	All levels
State	Status of the flow: <ul style="list-style-type: none"> • Drop—Drop all packets in the flow without response. • Forward—Forward the packet in the flow without looking at it. • Reject—Drop all packets in the flow with response. • Watch—Inspect packets in the flow. 	All levels
Dir	Direction of the flow: input (I) or output (O).	All levels
Frm count	Number of frames in the flow.	All levels
Byte count	Number of bytes in the flow.	extensive
Flow role	Flow role.	extensive
Timeout	Timeout value.	extensive

Table 9: show services flows Output Fields *(Continued)*

Field Name	Field Description	Level of Output
Flow path	Flow path: symmetric or asymmetric.	extensive

Sample Output

show services flows

```

user@host> show services flows
Interface: ms-2/0/0, Service set: IDP
Flow                               State   Dir      Frm count
TCP      10.2.2.2:33656 ->      10.1.1.2:80   Forward I           6
TCP      10.1.1.2:80 ->      10.2.2.2:33656 Forward 0           5
ICMP     10.1.1.2 ->      10.2.2.2      Forward I          102
ICMP     10.2.2.2 ->      10.1.1.2      Forward 0          102
ICMP     10.2.2.2 ->      10.1.1.2      Forward I           97
ICMP     10.1.1.2 ->      10.2.2.2      Forward 0           97

```

show services flows all

```

user@host> show services flows all
Interface: ms-2/0/0, Service set: idp-1
Flow                               State   Dir      Frm count
TCP      10.1.1.2:32769 ->      192.0.2.2:80   Forward I       353431
TCP      192.0.2.2:80 ->      10.1.1.2:32769 Forward 0       353429
TCP      10.1.1.2:32771 ->      192.0.2.2:80   Forward I       353562
TCP      192.0.2.2:80 ->      10.1.1.2:32771 Forward 0       353560
TCP      10.1.1.2:32770 ->      192.0.2.2:80   Forward I       353577
TCP      192.0.2.2:80 ->      10.1.1.2:32770 Forward 0       353575
TCP      10.1.1.2:32768 ->      192.0.2.2:80   Forward I       353610
TCP      192.0.2.2:80 ->      10.1.1.2:32768 Forward 0       353608
TCP      10.1.1.2:32777 ->      192.0.2.2:80   Forward I       353625
TCP      192.0.2.2:80 ->      10.1.1.2:32777 Forward 0       353624
TCP      10.1.1.2:32776 ->      192.0.2.2:80   Forward I       353643

```

TCP	192.0.2.2:80	->	10.1.1.2:32776	Forward	0	353642
TCP	10.1.1.2:32775	->	192.0.2.2:80	Forward	I	353658
TCP	192.0.2.2:80	->	10.1.1.2:32775	Forward	0	353657
TCP	10.1.1.2:32774	->	192.0.2.2:80	Forward	I	353676
TCP	192.0.2.2:80	->	10.1.1.2:32774	Forward	0	353674
TCP	10.1.1.2:32773	->	192.0.2.2:80	Forward	I	353692
TCP	192.0.2.2:80	->	10.1.1.2:32773	Forward	0	353690
TCP	10.1.1.2:32772	->	192.0.2.2:80	Forward	I	353704
TCP	192.0.2.2:80	->	10.1.1.2:32772	Forward	0	353702

show services flows brief

The output for the `show services flows brief` command is identical to that for the `show services flows` command. For sample output, see ["show services flows" on page 267](#).

show services flows extensive

```
user@host> show services flows extensive
Interface: ms-2/0/0, Service set: IDP
Flow                                     State   Dir      Frm count
TCP      10.2.2.2:33656 ->      10.1.1.2:80   Forward I           6
  Byte count: 346
  Flow role: Unknown, Timeout: 0, Flow path: Asymmetric
TCP      10.1.1.2:80 ->      10.2.2.2:33656 Forward 0           5
  Byte count: 334
  Flow role: Unknown, Timeout: 0, Flow path: Symmetric
ICMP     10.1.1.2 ->      10.2.2.2      Forward I        144
  Byte count: 12096
  Flow role: Unknown, Timeout: 0, Flow path: Symmetric
ICMP     10.2.2.2 ->      10.1.1.2      Forward 0        144
  Byte count: 12096
  Flow role: Unknown, Timeout: 0, Flow path: Symmetric
```

show services flows application-protocol

```
user@host> show services flows application-protocol dce-rpc
Interface: ms-2/0/0, Service set: ss-1
Flow                                     State   Dir      Frm count
TCP      192.168.200.65:1260 -> 192.168.200.69:5315 Forward I          14
```

TCP	192.168.200.69:5315	->	198.51.100.16:1031	Forward	0	11
TCP	192.168.200.65:1251	->	192.168.200.69:1026	Forward	I	7
TCP	192.168.200.69:1026	->	198.51.100.16:1029	Forward	0	5

show services flows count

```
user@host> show services flows count
```

Interface	Service set	Flow count
ms-2/0/0	IDP	6

show services flows destination-port

```
user@host> show services flows destination-port 80
```

Interface: ms-2/0/0, Service set: IDP

Flow	State	Dir	Frm count
TCP 10.2.2.2:33656 -> 10.1.1.2:80	Forward	I	6

show services flows destination-prefix

```
user@host> show services flows destination-prefix 10.1.1.2
```

Interface: ms-2/0/0, Service set: IDP

Flow	State	Dir	Frm count
TCP 10.2.2.2:33656 -> 10.1.1.2:80	Forward	I	6
ICMP 10.2.2.2 -> 10.1.1.2	Forward	O	137
ICMP 10.2.2.2 -> 10.1.1.2	Forward	I	132

show services flows interface

```
user@host> show services flows interface ms-2/0/0
```

Interface: ms-2/0/0, Service set: IDP

Flow	State	Dir	Frm count
TCP 10.2.2.2:33656 -> 10.1.1.2:80	Forward	I	6
TCP 10.1.1.2:80 -> 10.2.2.2:33656	Forward	O	5
ICMP 10.1.1.2 -> 10.2.2.2	Forward	I	162
ICMP 10.2.2.2 -> 10.1.1.2	Forward	O	162

ICMP	10.2.2.2	->	10.1.1.2	Forward	I	157
ICMP	10.1.1.2	->	10.2.2.2	Forward	0	157

show services flows protocol

```
user@host> show services flows protocol icmp
Interface: ms-2/0/0, Service set: IDP
```

Flow				State	Dir	Frm count
ICMP	10.1.1.2	->	10.2.2.2	Forward	I	202
ICMP	10.2.2.2	->	10.1.1.2	Forward	0	202
ICMP	10.2.2.2	->	10.1.1.2	Forward	I	197
ICMP	10.1.1.2	->	10.2.2.2	Forward	0	197

show services flows service-set

```
user@host> show services flows service-set sample
Interface: ms-2/0/0, Service set: sample
```

Flow				State	Dir	Frm count
TCP	10.2.2.2:33656	->	10.1.1.2:80	Forward	I	6
TCP	10.1.1.2:80	->	10.2.2.2:33656	Forward	0	5
ICMP	10.1.1.2	->	10.2.2.2	Forward	I	220
ICMP	10.2.2.2	->	10.1.1.2	Forward	0	220
ICMP	10.2.2.2	->	10.1.1.2	Forward	I	215
ICMP	10.1.1.2	->	10.2.2.2	Forward	0	215

show services flows source-port

```
user@host> show services flows source-port 0
Interface: ms-2/0/0, Service set: IDP
```

Flow				State	Dir	Frm count
TCP	10.2.2.2:33656	->	10.1.1.2:80	Forward	I	6
TCP	10.1.1.2:80	->	10.2.2.2:33656	Forward	0	5
ICMP	10.1.1.2	->	10.2.2.2	Forward	I	235
ICMP	10.2.2.2	->	10.1.1.2	Forward	0	235
ICMP	10.2.2.2	->	10.1.1.2	Forward	I	230
ICMP	10.1.1.2	->	10.2.2.2	Forward	0	230

show services flows source-prefix

```

user@host> show services flows source-prefix 10.2.2.2
Interface: ms-2/0/0, Service set: IDP
Flow                                     State   Dir      Frm count
TCP      10.2.2.2:33656 ->      10.1.1.2:80   Forward I          6
TCP      10.1.1.2:80 ->      10.2.2.2:33656 Forward 0          5
ICMP     10.1.1.2 ->      10.2.2.2      Forward I        235
ICMP     10.2.2.2 ->      10.1.1.2      Forward 0        235
ICMP     10.2.2.2 ->      10.1.1.2      Forward I       230
ICMP     10.1.1.2 ->      10.2.2.2      Forward 0       230

```

Release Information

- Command introduced in Junos OS Release 9.5.
- all option added in Junos OS Release 11.1.
- application-protocol option added in Junos OS Release 11.1.

RELATED DOCUMENTATION

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show services local-policy-decision-function flows

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Syntax

```
show services local-policy-decision-function flows (interface interface-name | subscriber subscriber-name)
```

Description

Display local policy decision function (L-PDF) flows.

Options

- | | |
|--|--|
| <code>interface <i>interface-name</i></code> | Display L-PDF flows for the specified interface only. |
| <code>subscriber <i>subscriber-name</i></code> | Display L-PDF flows for the specified subscriber only. |

Required Privilege Level

view

Output Fields

[Table 10 on page 278](#) lists the output fields for the `show services local-policy-decision-function flows` command. Output fields are listed in the approximate order in which they appear.

Table 10: show services local-policy-decision-function flows Output Fields

Field Name	Field Description
Interface	Interface name.
service-set	Service set name.
service-set-interface	Service set interface name.
Currently active flows	Number of currently active flows.
High watermark flows	Maximum number of flows.
Protocol	(With interface option) Protocol identifier.
Source address	(With interface option) Source address.
Source port	(With interface option) Source port.
Destination address	(With interface option) Destination address.
Destination port	(With interface option) Destination port.
Application	(With interface option) Application name.
Application group	(With interface option) Application group identifier.

Sample Output

show services local-policy- decision-function flows subscriber

```

user@host> show services local-policy-decision-function flows subscriber user@example.com
Interface: ge-0/0/5.26

service-set: aacl_ms30
service-set interface: ms-3/0/0

Currently active flows: 0
High watermark flows: 0

```

show services local-policy- decision-function flows interface

```

user@host> show services local-policy-decision-function flows interface ge-1/1/0
Interface: ge-1/1/0.0

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

Currently active flows: 2
High watermark flows: 2

```

Protocol	Source address	Source port	Destination address	Destination port	
Application	Application group				
tcp	10.1.1.2	81	198.51.100.2	32813	junos:ftp
[63]	unknown [1023]				
tcp	198.51.10.2	32813	10.1.1.2	81	junos:ftp
[63]	unknown [1023]				

Release Information

Command introduced in Junos OS Release 9.5.

show services local-policy-decision-function statistics

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Syntax

```
show services local-policy-decision-function statistics (interface interface-name | subscriber subscriber-name)
```

Description

Display local-policy-decision-function (L-PDF) statistics.

Options

- | | |
|--|---|
| <code>interface <i>interface-name</i></code> | Display L-PDF statistics for the specified interface only. |
| <code>subscriber <i>subscriber-name</i></code> | Display L-PDF statistics for the specified subscriber only. |

Required Privilege Level

view

Output Fields

Table 11 on page 281 lists the output fields for the `show services local-policy-decision-function statistics` command. Output fields are listed in the approximate order in which they appear.

Table 11: show services local-policy-decision-function statistics Output Fields

Field Name	Field Description
Interface	Interface name.
service-set	Service set name.
service-set-interface	Service set interface name.
Application group	Application group identifier.
Application	Application name.
Packets in	Number of ingress packets.
Bytes in	Number of ingress bytes.
Packets out	Number of egress packets.
Bytes out	Number of egress bytes.

Sample Output

show services local-policy-decision-function statistics interface

```
user@host> show services local-policy-decision-function statistics interface ge-1/1/0
Interface: ge-1/1/0.0

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

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

show services local-policy-decision-function statistics subscriber

```
user@host> show services local-policy-decision-function statistics subscriber user@example.com
Service-set-interface: ms-1/3/0
Service set: aacl-svc-set

Application-aware-access-list statistics
```

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

Release Information

Command introduced in Junos OS Release 9.5.

show services sessions

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Syntax

```
show services sessions
<brief | extensive | terse>
<application-protocol protocol>
<count>
<destination-port destination-port>
<destination-prefix destination-prefix>
<interface interface-name>
<limit number>
<protocol protocol>
<service-set service-set>
<source-port source-port>
<source-prefix source-prefix>
<utilization>
```

Description

Display session information.

NOTE: On MX Series routers (with interchassis redundancy configured), the idle timeout for every flow is displayed in the `show services session extensive` and `show services flows extensive` commands.

Options

none	Display standard information about all sessions.
brief extensive terse	(Optional) Display the specified level of output.
application-protocol <i>protocol</i>	<p>(Optional) Display information about one of the following application protocols:</p> <ul style="list-style-type: none"> • <code>bootp</code>—Bootstrap protocols • <code>dce-rpc</code>—Distributed Computing Environment-Remote Procedure Call protocols • <code>dce-rpc-portmap</code>—Distributed Computing Environment-Remote Procedure Call protocols portmap service • <code>dns</code>—Domain Name System protocol • <code>exec</code>—Remote Execution Protocol • <code>ftp</code>—File Transfer Protocol • <code>h323</code>—H.323 • <code>icmp</code>—ICMP • <code>icmpv6</code>—ICMPv6 • <code>iiop</code>—Internet Inter-ORB Protocol • <code>ike-esp-nat</code>—IKE ALG • <code>ip</code>—IP • <code>login</code>—LOGIN • <code>netbios</code>—NETBIOS

- netshow—NETSHOW
- ptp—Point-to-Point Tunneling Protocol
- realaudio—RealAudio
- rpc—Remote Procedure Call protocol
- rpc-portmap—Remote Procedure Call protocol portmap service
- rtsp—Real-Time Streaming Protocol
- rsh—Remote Shell
- sip—Session Initiation Protocol
- shell—Shell
- snmp—SNMP
- sql—SQLNet
- talk—Talk Program
- tftp—Trivial File Transfer Protocol
- traceroute—Traceroute
- winframe—WinFrame

NOTE: You can use the none option with the show services sessions count application-protocol command to display information about sessions other than ALG sessions.

count	(Optional) Display a count of the matching entries.
destination-port <i>destination-port</i>	(Optional) Display information for the specified destination port. The range of values is from 0 to 65,535.
destination-prefix <i>destination-prefix</i>	(Optional) Display information for the specified destination prefix.
interface <i>interface-name</i>	(Optional) Display information about the specified interface. On M Series and T Series routers, <i>interface-name</i> can be <i>ms-fpc/pic/port</i> or <i>rspnumber</i> . On J Series routers, <i>interface-name</i> is <i>ms-pim/0/port</i> .

limit <i>number</i>	(Optional) Maximum number of entries to display.
protocol <i>protocol</i>	(Optional) Display information about one of the following IP types: <ul style="list-style-type: none"> • <i>number</i>—Numeric protocol value from 0 to 255 • <i>ah</i>—IPsec Authentication Header protocol • <i>egp</i>—An exterior gateway protocol • <i>esp</i>—IPsec Encapsulating Security Payload protocol • <i>gre</i>—A generic routing encapsulation protocol • <i>icmp</i>—Internet Control Message Protocol • <i>icmp6</i>—Internet Control Message Protocol version 6 • <i>igmp</i>—Internet Group Management Protocol • <i>ipip</i>—IP-within-IP Encapsulation Protocol • <i>ospf</i>—Open Shortest Path First protocol • <i>pim</i>—Protocol Independent Multicast protocol • <i>rsvp</i>—Resource Reservation Protocol • <i>sctp</i>—Stream Control Transmission Protocol • <i>tcp</i>—Transmission Control Protocol • <i>udp</i>—User Datagram Protocol
service-set <i>service-set</i>	(Optional) Display information for the specified service set.
source-port <i>source-port</i>	(Optional) Display information for the specified source port. The range of values is from 0 to 65,535.
source-prefix <i>source-prefix</i>	(Optional) Display information for the specified source prefix.
utilization	(Optional) Display statistical details about session utilization.

Required Privilege Level

view

Output Fields

Table 12 on page 287 lists the output fields for the `show services sessions` command. Output fields are listed in the approximate order in which they appear.

Table 12: show services sessions Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the interface.	application-protocol
Session	Session ID that uniquely identifies the session.	All levels
ALG	Name of the application.	terse
Flags	Session flag for the ALG: <ul style="list-style-type: none"> • 0x1—Found an existing session. • 0x2—Reached session or flow limit. • 0x3—No memory available for new sessions. • 0x4—No free session ID available. • 0x0000—No session ID found. 	All levels
IP Action	Flag indicating whether IP action has been set for the session.	All levels
Offload	Flag indicating whether the session has been offloaded to the Packet Forwarding Engine.	All levels

Table 12: show services sessions Output Fields (Continued)

Field Name	Field Description	Level of Output
Asymmetric	Flag indicating whether the session is uni-directional.	terse application-protocol
Service set	Name of a service set. Individual empty service sets are not displayed.	count
Sessions Count	Number of sessions.	count

Sample Output

show services sessions

```

user@host> show services sessions
ms-2/0/0
Session: 293, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP      10.10.10.2:43677 -> 10.20.20.1:53 Forward I      1
UDP      10.20.20.1:53   -> 192.0.2.1:43677 Forward 0      1
Session: 53, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP      10.10.10.2:37494 -> 10.20.20.1:53 Forward I      1
UDP      10.20.20.1:53   -> 10.11.11.11:37494 Forward 0      1
Session: 66, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP      10.10.10.2:48161 -> 10.20.20.1:53 Forward I      1
UDP      10.20.20.1:53   -> 10.11.11.11:48161 Forward 0      1
Session: 17, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP      10.10.10.2:38908 -> 10.20.20.1:53 Forward I      1
UDP      10.20.20.1:53   -> 10.11.11.11:38908 Forward 0      1
Session: 42, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP      10.10.10.2:58189 -> 10.20.20.1:53 Forward I      1
UDP      10.20.20.1:53   -> 10.11.11.11:58189 Forward 0      1

```

show services sessions brief

The output for the `show services flows brief` command is identical to that for the `show services sessions` command. For sample output, see ["show services sessions" on page 288](#).

show services sessions extensive

```
user@host> show services sessions extensive
ms-0/1/0
Session: 2, ALG: 0, Flags: 0x0080, IP Action: no, Offload: no
NAT PPlugin Data:
  NAT Action: Translation Type - DYNAMIC NAT44
  NAT source      192.0.21.2      ->  10.10.10.127
TCP      192.0.2.2:52145 ->      198.51.100.2:23    Forward I          22
  Byte count: 1483
  Flow role: Unknown, Timeout: 0
TCP      198.51.100.2:23  ->  10.10.10.127:52145 Forward 0          18
  Byte count: 2712
  Flow role: Unknown, Timeout: 0
```

show services sessions terse

```
user@router> show services sessions terse
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I          33
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0          31
```

show services sessions application-protocol

This command has the same output for the `rpc`, `dce-rpc`, `rpc-portmap` and `dce-rpc-portmap` ALGs.

```
user@router> show services sessions application-protocol dce-rpc
Interface name: ms-1/1/0
Session: 8, ALG: portmapper, Flags: 0x1800, IP Action: no, Offload: no
UDP      192.168.203.198:1019 ->192.168.203.194:2049 Forward I          4
UDP      192.168.203.194:2049 ->192.168.203.198:1019 Forward 0          4
Session: 7, ALG: portmapper, Flags: 0x1800, IP Action: no, Offload: no
UDP      192.168.203.198:954  ->192.168.203.194:613 Forward I          1
```

```

UDP    192.168.203.194:613  ->192.168.203.198:954  Forward  0          1
Session: 6, ALG: portmapper, Flags: 0x1800, IP Action: no, Offload: no
UDP    192.168.203.198:53836 ->192.168.203.194:613  Forward  I          1
UDP    192.168.203.194:613  ->192.168.203.198:53836 Forward  0          1
Session: 5, ALG: portmapper, Flags: 0x1000, IP Action: no, Offload: no
UDP    192.168.203.198:59813 ->192.168.203.194:111  Forward  I          1
UDP    192.168.203.194:111  ->192.168.203.198:59813 Forward  0          1
Session: 4, ALG: portmapper, Flags: 0x1800, IP Action: no, Offload: no
UDP    192.168.203.198:36595 ->192.168.203.194:2049 Forward  I          1
UDP    192.168.203.194:2049 ->192.168.203.198:36595 Forward  0          1
Session: 3, ALG: portmapper, Flags: 0x1000, IP Action: no, Offload: no
UDP    192.168.203.198:56050 ->192.168.203.194:111  Forward  I          1
UDP    192.168.203.194:111  ->192.168.203.198:56050 Forward  0          1

```

user@router> **show services sessions application-protocol dns**

Interface name: ms-2/0/0

```

Session: 293, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP    198.51.100.2:43677 -> 203.0.113.10:53  Forward  I          1
UDP    203.0.113.10:53    -> 192.0.2.1:43677 Forward  0          1
Session: 53, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP    198.51.100.2:37494 -> 203.0.113.10:53  Forward  I          1
UDP    203.0.113.10:53    -> 192.0.2.1:37494 Forward  0          1
Session: 66, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP    198.51.100.2:48161 -> 203.0.113.10:53  Forward  I          1
UDP    203.0.113.10:53    -> 192.0.2.1:48161 Forward  0          1
Session: 17, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP    198.51.100.2:38908 -> 203.0.113.10:53  Forward  I          1
UDP    203.0.113.10:53    -> 192.0.2.1:38908 Forward  0          1
Session: 42, ALG: 16, Flags: 0x0040, IP Action: no, Offload: no
UDP    198.51.100.2:58189 -> 203.0.113.10:53  Forward  I          1
UDP    203.0.113.10:53    -> 192.0.2.1:58189 Forward  0          1

```

user@router> **show services sessions application-protocol ftp**

Interface name: ms-4/1/0

```

Session: 1, ALG: 1, Flags: 0x0040, IP Action: no, Offload: no
TCP    192.0.2.129:32843 -> 198.51.100.129:21  Forward  I          26
TCP    198.51.100.129:21  -> 192.0.2.0:32843 Forward  0          30

```

user@router> **show services sessions application-protocol ike-esp-nat**

Service Set: ss_ipv4, Session: 33554435, ALG: ike-esp-nat, Flags: 0x0800, IP Action: no, Offload: no, Asymmetric: no

```
ESP 198.51.100.2:4689 -> 203.0.113.1:62108 Forward 0 2199
```

```
ESP 192.0.2.2:62108 -> 198.51.100.2:4689 Forward I 0
```

Service Set: ss_ipv4, Session: 33554434, ALG: ike-esp-nat, Flags: 0x0800, IP Action: no, Offload: no, Asymmetric: no

```

ESP 192.0.2.2:44179 -> 198.51.100.2:43809 Forward I 2199
ESP 198.51.100.2:43809 -> 203.0.113.1:44179 Forward O 0
Service Set: ss_ipv4, Session: 33554433, ALG: ike-esp-nat, Flags: 0x0000, IP Action: no,
Offload: no, Asymmetric: no
UDP 192.0.2.2:500 -> 198.51.100.2:500 Forward I 8
UDP 198.51.100.2:500 -> 203.0.113.1:57730 Forward O
user@router> show services sessions application-protocol pptp

```

```

Interface name: ms-2/0/0
Session: 3, ALG: pptp, Flags: 0x2800, IP Action: no, Offload: no, Asymmetric: no
GRE      203.0.113.138:0 -> 203.0.113.138:0 Forward O 21
GRE      192.0.2.794:0 -> 203.0.113.138:0:65000 Forward I 0
Session: 2, ALG: pptp, Flags: 0x2800, IP Action: no, Offload: no, Asymmetric: no
GRE      192.0.2.794:0 -> 203.0.113.138:0:49913 Forward I 88
GRE      203.0.113.138:0:49913 -> 192.0.2.794:65001 Forward O 0
Session: 1, ALG: pptp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      192.0.2.794:1511 -> 203.0.113.138:0:1723 Forward I 13
TCP      203.0.113.138:0:1723 -> 192.0.2.794:1511 Forward O 12

```

```

user@router> show services sessions application-protocol rtsp
Interface name: ms-0/1/0
Session: 13, ALG: rtsp, Flags: 0x0800, IP Action: no, Offload: no
UDP      203.0.113.66:5004 -> 198.51.100.66:3989 Forward O 152
UDP      198.51.100.66:3989 -> 192.0.2.161:5004 Forward I 0
Session: 9, ALG: rtsp, Flags: 0x0800, IP Action: no, Offload: no
UDP      203.0.113.66:5004 -> 198.51.100.66:3986 Forward O 3
UDP      198.51.100.66:3986 -> 192.0.2.161:5004 Forward I 0

```

```

user@router> show services sessions application-protocol rsh
Interface name: ms-2/0/0
Session: 3, ALG: 2, Flags: 0x0840, IP Action: no, Offload: no
TCP      203.0.113.10:1023 -> 198.51.100.2:1020 Forward O 4
TCP      198.51.100.2:1020 -> 203.0.113.10:1023 Forward I 3
Session: 1, ALG: 2, Flags: 0x0040, IP Action: no, Offload: no
TCP      198.51.100.2:1021 -> 203.0.113.10:514 Forward I 1331
TCP      203.0.113.10:514 -> 198.51.100.2:1021 Forward O 2485

```

```

user@router> show services sessions application-protocol sip
Interface name: ms-2/0/0
Session: 4, ALG: sip, Flags: 0x0800, IP Action: no, Offload: no
UDP      198.51.100.130:6000 -> 192.0.2.129:12682 Forward I 246
UDP      192.0.2.129:12682 -> 198.51.100.162:6000 Forward O 0
Session: 1, ALG: sip, Flags: 0x0000, IP Action: no, Offload: no
UDP      198.51.100.130:5060 -> 192.0.2.130:5060 Forward I 10
UDP      192.0.2.130:5060 -> 198.51.100.162:5060 Forward O 9

```

```

user@router> show services sessions application-protocol sql
Interface name: ms-2/0/0
Session: 3934, ALG: sqlnet, Flags: 0x0800, IP Action: no, Offload: no
TCP      198.51.100.2:39754 ->    203.0.113.138:0:1408 Forward I      26
TCP      203.0.113.138:0:1408 ->    192.0.2.1:39754 Forward 0      23

user@router> show services sessions application-protocol talk
Interface name: ms-0/2/0
Session: 4, ALG: 65, Flags: 0x0800, IP Action: no, Offload: no
TCP      203.0.113.162:36888 ->    192.0.2.2:33294 Forward 0      4
TCP      192.0.2.1:33294 ->    203.0.113.162:36888 Forward I      3
Session: 7, ALG: 65, Flags: 0x0800, IP Action: no, Offload: no
UDP      203.0.113.162:1165 ->    192.0.2.2:518 Forward 0      1
UDP      192.0.2.2:518 ->    203.0.113.162:1165 Forward I      1
Session: 8, ALG: 65, Flags: 0x0000, IP Action: no, Offload: no
UDP      192.0.2.2:1509 ->    203.0.113.162:518 Forward I      3
UDP      203.0.113.162:518 ->    192.0.2.2:1509 Forward 0      3
Session: 6, ALG: 0, Flags: 0x0000, IP Action: no, Offload: no
UDP      192.0.2.1:123 ->    192.0.2.2:123 Forward 0      4

```

show services sessions count

```

user@host> show services sessions count
Interface  Service set                      Sessions count
ms-1/1/0   ss                                2

```

show services sessions destination-port

```

user@router> show services sessions destination-port 21
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->    10.1.1.2:21 Forward I      25
TCP      10.1.1.2:21 ->    10.2.2.2:52138 Forward 0      24

```

show services sessions destination-prefix

```

user@router> show services sessions destination-prefix 10.1.1.2
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I          25
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0          24

```

show services sessions interface

```

user@router> show services sessions interface ms-1/1/0
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I          30
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0          29

```

show services sessions protocol

```

user@router> show services sessions protocol tcp
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I          30
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0          29

```

show services sessions service-set

```

user@router> show services sessions service-set sample
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I          33
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0          31

```

show services sessions source-port

```

user@router> show services sessions source-port 21
ms-1/1/0

```

```

Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I      33
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0      31

```

show services sessions source-prefix

```

user@router> show services sessions source-prefix 10.2.2.2
ms-1/1/0
Session: 1, ALG: ftp, Flags: 0x2000, IP Action: no, Offload: no, Asymmetric: no
TCP      10.2.2.2:52138 ->      10.1.1.2:21    Forward I      33
TCP      10.1.1.2:21    ->      10.2.2.2:52138 Forward 0      31

```

Release Information

Command introduced in Junos OS Release 10.4.

Support added in Junos OS Release 19.3R2 for Next Gen Services on MX Series routers MX240, MX480 and MX960 with the MX-SPC3 services card.