

Flow Monitoring on EX9200 Switches

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Flow Monitoring on EX9200 Switches

15.1

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About the Documentation

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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

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

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Supported Platforms

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

- EX Series

Using the Examples in This Manual

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

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

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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

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

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

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

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

Documentation Conventions

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

Table 1: Notice Icons

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

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

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the configure command: user@host> configure

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

Convention	Description	Examples
Fixed-width text like this	Represents output that appears on the terminal screen.	<code>user@host> show chassis alarms</code> <code>No alarms currently active</code>
<i>Italic text like this</i>	<ul style="list-style-type: none">Introduces or emphasizes important new terms.Identifies guide names.Identifies RFC and Internet draft titles.	<ul style="list-style-type: none">A policy <i>term</i> is a named structure that defines match conditions and actions.<i>Junos OS CLI User Guide</i>RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none">To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level.The console port is labeled CONSOLE.
< > (angle brackets)	Encloses optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (string1 string2 string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Encloses a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none">In the Logical Interfaces box, select All Interfaces.To cancel the configuration, click Cancel.

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

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

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We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

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- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>

- Download the latest versions of software and review release notes:
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- Search technical bulletins for relevant hardware and software notifications:
<http://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

- [Understanding Flow Monitoring on page 3](#)

CHAPTER 1

Understanding Flow Monitoring

- [Active Flow Monitoring Overview on page 3](#)

Active Flow Monitoring Overview

Using a Juniper Networks M Series Multiservice Edge or T Series Core Router or EX9200 switch, a selection of PICs (including the Monitoring Services PIC, Adaptive Services [AS] PIC, Multiservices PIC, or Multiservices DPC) and other networking hardware, you can monitor traffic flow and export the monitored traffic. Monitoring traffic allows you to do the following:

- Gather and export detailed information about IP version 4 (IPv4) traffic flows between source and destination nodes in your network.
- Sample all incoming IPv4 traffic on the monitoring interface and present the data in cflowd record format.
- Perform discard accounting on an incoming traffic flow.
- Encrypt or tunnel outgoing cflowd records, intercepted IPv4 traffic, or both.
- Direct filtered traffic to different packet analyzers and present the data in its original format (port mirror).



NOTE: Monitoring Services PICs, AS PICs, and Multiservices PICs must be mounted on an Enhanced Flexible PIC Concentrator (FPC) in an M Series or T Series router.

Multiservices DPCs installed in Juniper Networks MX Series 3D Universal Edge Routers support the same functionality, with the exception of the passive monitoring and flow-tap features.

Although the Monitoring Services PIC was designed initially for use as an offline passive flow monitoring tool, it can also be used in an active flow monitoring topology. In contrast, the AS or Multiservices PIC is designed exclusively for active flow monitoring. To use either the Monitoring Services PIC, AS PIC, or Multiservices PIC for active flow monitoring, you must install the PIC in an M Series or T Series router. The router participates in both the monitoring application and in the normal routing functionality of the network.

Starting with Junos OS Release 11.4, support for active monitoring is extended to logical systems running on T Series and MX Series routers. A logical system is a partition created from a physical router that performs independent routing tasks. Several logical systems in a single router with their own interfaces, policies, instances, and routing tables can perform functions handled by several different routers. A shared services PIC handles flows from all the logical systems. Only version 9 flows, IPv4, and MPLS templates are supported. See *Example: Configuring Active Monitoring on Logical Systems* for a sample configuration that enables active monitoring on a logical system.

Specified packets can be filtered and sent to the monitoring interface. For the Monitoring Services PIC, the interface name contains the **mo-** prefix. For the AS or Multiservices PIC, the interface name contains the **sp-** prefix.



NOTE: If you upgrade from the Monitoring Services PIC to the Adaptive Services or Multiservices PIC for active flow monitoring, you must change the name of your monitoring interface from **mo-fpc/pic/port** to **sp-fpc/pic/port**.

The major active flow monitoring actions you can configure at the **[edit forwarding-options]** hierarchy level are as follows:

- Sampling, with the **[edit forwarding-options sampling]** hierarchy. This option sends a copy of the traffic stream to an AS or Monitoring Services PIC, which extracts limited information (such as the source and destination IP address) from some of the packets in a flow. The original packets are forwarded to the intended destination as usual.
- Discard accounting, with the **[edit forwarding-options accounting]** hierarchy. This option quarantines unwanted packets, creates cflowd records that describe the packets, and discards the packets instead of forwarding them.
- Port mirroring, with the **[edit forwarding-options port-mirroring]** hierarchy. This option makes one full copy of all packets in a flow and delivers the copy to a single destination. The original packets are forwarded to the intended destination.
- Multiple port mirroring, with the **[edit forwarding-options next-hop-group]** hierarchy. This option allows multiple copies of selected traffic to be delivered to multiple destinations. (Multiple port mirroring requires a Tunnel Services PIC.)

Unlike passive flow monitoring, you do not need to configure a monitoring group. Instead, you can send filtered packets to a monitoring services or adaptive services interface (**mo-** or **sp-**) by using sampling or discard accounting. Optionally, you can configure port mirroring or multiple port mirroring to direct packets to additional interfaces.

These active flow monitoring options provide a wide variety of actions that can be performed on network traffic flows. However, the following restrictions apply:

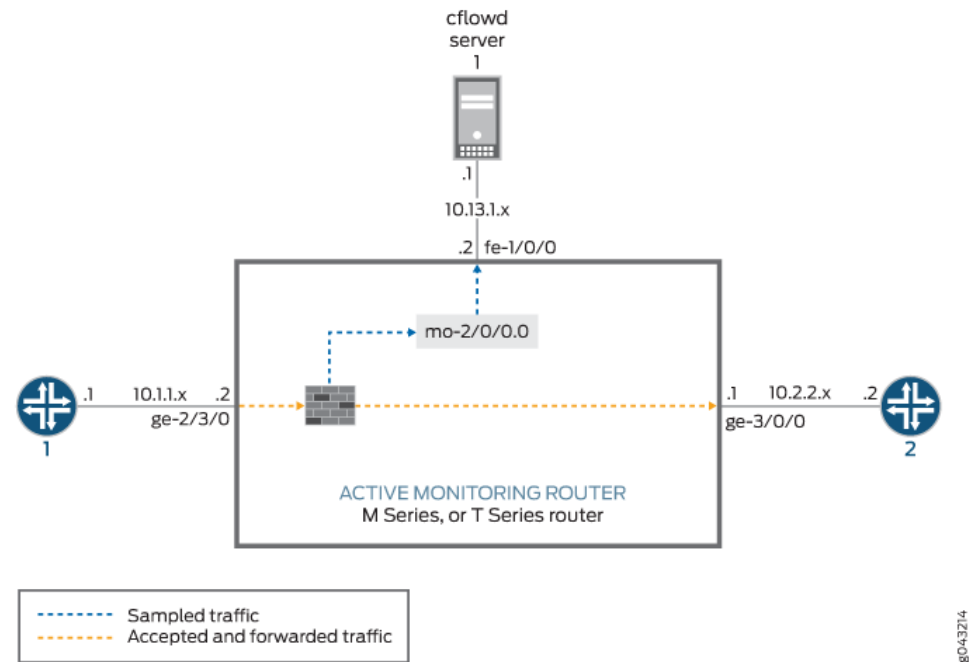
- The router or switch can perform sampling or port mirroring at any one time.
- The router or switch can perform forwarding or discard accounting at any one time.

Because the Monitoring Services, AS, and Multiservices PICs allow only one action to be performed at any one time, the following configuration options are available:

- Sampling and forwarding
- Sampling and discard accounting
- Port mirroring and forwarding
- Port mirroring and discard accounting
- Sampling and port mirroring on different sets of traffic

Figure 1 on page 5 shows a sample topology.

Figure 1: Active Monitoring Configuration Topology



In Figure 1 on page 5, traffic from Router 1 arrives on the monitoring router's Gigabit Ethernet `ge-2/3/0` interface. The exit interface on the monitoring router leading to destination Router 2 is `ge-3/0/0`, but this could be any interface type (such as SONET, Gigabit Ethernet, and so on). The export interface leading to the cflowd server is `fe-1/0/0`.

To enable active monitoring, configure a firewall filter on the interface `ge-2/3/0` with the following match conditions:

- Traffic matching certain firewall conditions is sent to the Monitoring Services PIC using filter-based forwarding. This traffic is quarantined and not forwarded to other routers.
- All other traffic is port-mirrored to the Monitoring Services PIC. Port mirroring copies each packet and sends the copies to the port-mirroring next hop (in this case, a Monitoring Services PIC). The original packets are forwarded out of the router as usual.

**Related
Documentation**

- [Configuring Flow Monitoring on page 9](#)
- *Directing Replicated Flows to Multiple Flow Servers*
- *Configuring Services Interface Redundancy with Flow Monitoring*
- *Example: Configuring Active Monitoring on Logical Systems*

PART 2

Configuring Flow Monitoring

- [Configuring Basic Flow Monitoring on page 9](#)
- [Configuring Active Flow Monitoring on page 15](#)

CHAPTER 2

Configuring Basic Flow Monitoring

- [Configuring Flow Monitoring on page 9](#)

Configuring Flow Monitoring

The flow-monitoring application performs traffic flow monitoring and enables lawful interception of traffic between two routers or switches. Traffic flows can either be passively monitored by an offline router or switch or actively monitored by a router participating in the network.

To configure flow monitoring you need to do the following:

- [Configuring Flow-Monitoring Interfaces on page 9](#)
- [Configuring Flow-Monitoring Properties on page 11](#)
- [Example: Configuring Flow Monitoring on page 13](#)

Configuring Flow-Monitoring Interfaces

To enable flow monitoring on the Monitoring Services PIC, include the **mo-fpc/pic/port** statement at the **[edit interfaces]** hierarchy level:

```
mo-fpc/pic/port {
  unit logical-unit-number {
    family inet {
      address address {
        destination address;
      }
      filter {
        group filter-group-number;
        input filter-name;
        output filter-name;
      }
      sampling {
        [ input output ];
      }
    }
  }
}
multiservice-options {
  (core-dump | no-core-dump);
  (syslog | no-syslog);
  flow-control-options {
```

```
        down-on-flow-control;  
        dump-on-flow-control;  
        reset-on-flow-control;  
    }  
}  
}
```

Specify the physical and logical location of the flow-monitoring interface. You cannot use **unit 0**, because it is already used by internal processes. Specify the source and destination addresses. The **filter** statement allows you to associate an input or output filter or a filter group that you have already configured for this purpose. The **sampling** statement specifies the traffic direction: **input**, **output**, or both.

The **multiservice-options** statement allows you to configure properties related to flow-monitoring interfaces:

- Include the **core-dump** statement to enable storage of core files in **/var/tmp**.
- Include the **syslog** statement to enable storage of system logging information in **/var/log**.



NOTE: Boot images for monitoring services interfaces are specified at the [edit chassis images pic] hierarchy level. You must include the following configuration to make the flow monitoring feature operable:

```
[edit system]  
ntp {  
    boot-server ntp.juniper.net;  
    server 172.17.28.5;  
}  
processes {  
    ntp enable;  
}
```

For more information, see the *Junos OS Administration Library for Routing Devices*.

- Include the **flow-control-options** statement to configure flow control.



NOTE: Starting with Junos OS Release 15.1, instead of an eJunos kernel core file, the multiservices PIC management daemon core file is generated when a prolonged flow control failure occurs and when you configure the setting to generate a core dump during prolonged flow control (by using the **dump-on-flow-control** option with the **flow-control-options** statement). The watchdog functionality continues to generate a kernel core file in such scenarios.

Configuring Flow-Monitoring Properties

To configure flow-monitoring properties, include the **monitoring** statement at the **[edit forwarding-options]** hierarchy level:

```
monitoring name {
  family inet {
    output {
      cflowd hostname port port-number;
      export-format format;
      flow-active-timeout seconds;
      flow-export-destination {
        collector-pic;
      }
      flow-inactive-timeout seconds;
      interface interface-name {
        engine-id number;
        engine-type number;
        input-interface-index number;
        output-interface-index number;
        source-address address;
      }
    }
  }
}
```

A monitoring instance is a named entity that specifies collector information under the **monitoring name** statement. The following sections describe the properties you can configure:

- [Directing Traffic to Flow-Monitoring Interfaces on page 11](#)
- [Exporting Flows on page 12](#)
- [Configuring Time Periods when Flow Monitoring is Active and Inactive on page 12](#)

Directing Traffic to Flow-Monitoring Interfaces

To direct traffic to a flow-monitoring interface, include the **interface** statement at the **[edit forwarding-options monitoring name output]** hierarchy level. By default, the Junos OS automatically assigns values for the **engine-id** and **engine-type** statements:

- **engine-id**—Monitoring interface location.
- **engine-type**—Platform-specific monitoring interface type.

The **source-address** statement specifies the traffic source for transmission of cflowd information; you must configure it manually. If you provide a different **source-address** statement for each monitoring services output interface, you can track which interface processes a particular cflowd record.

By default, the **input-interface-index** value is the SNMP index of the input interface. You can override the default by including a specific value. The **input-interface-index** and **output-interface-index** values are exported in fields present in the cflowd version 5 flow format.

Exporting Flows

To direct traffic to a flow collection interface, include the **flow-export-destination** statement. For more information about flow collection, see *Flow Collection*.

To configure the cflowd version number, include the **export-format** statement at the **[edit forwarding-options monitoring name output]** hierarchy level. By default, version 5 is used. Version 8 enables the router software to aggregate the flow information using broader criteria and reduce cflowd traffic. Version 8 aggregation is performed periodically (every few seconds) on active flows and when flows are allowed to expire. Because the aggregation is performed periodically, active timeout events are ignored.

For more information on cflowd properties, see *Enabling Flow Aggregation*.

Configuring Time Periods when Flow Monitoring is Active and Inactive

To configure time periods for active flow monitoring and intervals of inactivity, include the **flow-active-timeout** and **flow-inactive-timeout** statements at the **[edit forwarding-options monitoring name output]** hierarchy level:

- The **flow-active-timeout** statement specifies the time interval between flow exports for active flows. If the interval between the time the last packet was received and the time the flow was last exported exceeds the configured value, the flow is exported.

This timer is needed to provide periodic updates when a flow has a long duration. The active timeout setting enables the router to retain the start time for the flow as a constant and send out periodic cflowd reports. This in turn allows the collector to register the start time and determine that a flow has survived for a duration longer than the configured active timeout.



NOTE: In active flow monitoring, the cflowd records are exported after a time period that is a multiple of 60 seconds and greater than or equal to the configured active timeout value. For example, if the active timeout value is 90 seconds, the cflowd records are exported at 120-second intervals. If the active timeout value is 150 seconds, the cflowd records are exported at 180-second intervals, and so forth.

- The **flow-inactive-timeout** statement specifies the interval of inactivity for a flow that triggers the flow export. If the interval between the current time and the time that the last packet for this flow was received exceeds the configured inactive timeout value, the flow is allowed to expire.

If the flow stops transmitting for longer than the configured inactive timeout value, the router or switch purges it from the flow table and exports the cflowd record. As a result, the flow is forgotten as far as the PIC is concerned and if the same 5-tuple appears again, it is assigned a new start time and considered a new flow.

Both timers are necessary. The active timeout setting is needed to provide information for flows that constantly transmit packets for a long duration. The inactive timeout setting

enables the router or switch to purge flows that have become inactive and would waste tracking resources.



NOTE: The router must contain an Adaptive Services, Multiservices, or Monitoring Services PIC for the `flow-active-timeout` and `flow-inactive-timeout` statements to take effect.

Example: Configuring Flow Monitoring

The following is an example of flow-monitoring properties configured to support input SONET/SDH interfaces, output monitoring services interfaces, and export to cflowd for flow analysis. To complete the configuration, you also need to configure the interfaces and set up a virtual private network (VPN) routing and forwarding (VRF) instance. For a complete example, see the *Junos OS, Release 15.1*. For information on cflowd, see *Enabling Flow Aggregation*.

```
[edit forwarding-options]
monitoring group1 {
  family inet {
    output {
      cflowd 192.168.245.2 port 2055;
      export-format cflowd-version-5;
      flow-active-timeout 60;
      flow-inactive-timeout 30;
      interface mo-4/0/0.1 {
        engine-id 1;
        engine-type 1;
        input-interface-index 44;
        output-interface-index 54;
        source-address 192.168.245.1;
      }
      interface mo-4/1/0.1 {
        engine-id 2;
        engine-type 1;
        input-interface-index 45;
        output-interface-index 55;
        source-address 192.168.245.1;
      }
      interface mo-4/2/0.1 {
        engine-id 3;
        engine-type 1;
        input-interface-index 46;
        output-interface-index 56;
        source-address 192.168.245.1;
      }
      interface mo-4/3/0.1 {
        engine-id 4;
        engine-type 1;
        input-interface-index 47;
        output-interface-index 57;
        source-address 192.168.245.1;
      }
    }
  }
}
```

```
}  
}  
}
```

**Related
Documentation**

- [Active Flow Monitoring Overview on page 3](#)
- *Directing Replicated Flows to Multiple Flow Servers*
- *Configuring Services Interface Redundancy with Flow Monitoring*
- *Example: Configuring Active Monitoring on Logical Systems*

CHAPTER 3

Configuring Active Flow Monitoring

- [Configuring Inline Active flow Monitoring on page 15](#)

Configuring Inline Active flow Monitoring

The inline active flow monitoring is implemented on the Packet Forwarding Engine. All the functions like flow creation, flow update, and flow records export are done by the Packet Forwarding Engine. The flow records are sent out in industry standard IPFIX format.

The inline active flow monitoring configuration can be broadly classified into four categories:

1. Configurations at the **[edit services flow-monitoring]** hierarchy level—At this level, you configure the template properties for inline flow monitoring.
2. Configurations at the **[edit forwarding-options]** hierarchy level—At this level, you configure a sampling instance and associate the template (configured at the **[edit services flow-monitoring]** hierarchy level) with the sampling instance. At this level, you also configure the flow-server IP address and port number as well as the flow export rate.
3. Configurations at the **[edit chassis]** hierarchy level—At this level, you associate the sampling instance with the FPC on which the media interface is present. If you are configuring sampling of IPv6 flows, you must also specify the flow hash table size.
4. Configurations at the **[edit firewall]** hierarchy level—At this level you configure a firewall filter for the family of traffic to be sampled. You must attach this filter to the interface on which you want to sample the traffic.

Before you configure inline active flow monitoring, you should ensure that you have adequately-sized hash tables for IPv4 and IPv6 flow sampling. These tables can use one to fifteen 256k areas, and each table is assigned a default value of one such area. When anticipated traffic volume requires larger tables, allocate larger tables.



NOTE: For Junos OS releases earlier than Release 12.1, the following points are applicable for supporting backward compatibility when you configure the IPv4 and IPv6 flow table sizes for inline active flow monitoring:

- If you do not configure the `flow-table-size` statement at the `[edit chassis fpc slot-number inline-services]` hierarchy level, fifteen 256K entries are allocated by default for the IPv4 flow table and one 1K entry is allocated by default for the IPv6 flow table on the Packet Forwarding Engine.
- If you configure the `ipv4-flow-table-size size` statement at the `[edit chassis fpc slot-number inline-services flow-table-size]` hierarchy level and if you do not configure the `ipv6-flow-table-size size` statement at the `[edit chassis fpc slot-number inline-services flow-table-size]` hierarchy level, the number of units of 256K entries that you configure for the IPv4 flow table is allocated. For the IPv6 flow table, a default size of one 1K entry is allocated on the Packet Forwarding Engine.
- If you do not configure the `ipv4-flow-table-size size` statement at the `[edit chassis fpc slot-number inline-services flow-table-size]` hierarchy level and if you configure the `ipv6-flow-table-size size` statement at the `[edit chassis fpc slot-number inline-services flow-table-size]` hierarchy level, the number of units of 256K entries that you configure for the IPv6 flow table is allocated. For the IPv4 flow table, a default size of one 1K entry is allocated on the Packet Forwarding Engine.
- If you configure the sizes of both the IPv4 and IPv6 flow tables, the flow tables are created on the Packet Forwarding Engine based on the size that you specified.



NOTE: The functionality to log the cflowd records in a log file before they are exported to a cflowd server (by including the `local-dump` statement at the `[edit forwarding-options sampling instance instance-name family (inet |inet6 |mpls) output flow-server hostname]` hierarchy level) is not supported when you configure inline flow monitoring (by including the `inline-jflow` statement at the `[edit forwarding-options sampling instance instance-name family inet output]` hierarchy level).

To allocate IPv4 and IPv6 flow hash tables:

1. Go to the `flow-table-size` hierarchy level for inline services on the FPC that processes the monitored flows.

```
[edit]
user@host# edit chassis fpc 0 inline-services flow-table-size
```

2. Specify the required sizes for the sampling hash tables.

```
[edit chassis fpc 0 inline-services flow-table-size]
user@host# set ipv4-flow-table-size 5
user@host# set ipv6-flow-table-size 5
```



NOTE: When you set the flow hash table sizes, remember:

- Any change in the configured size of flow hash table sizes initiates an automatic reboot of the FPC.
- The total number of units used for both IPv4 and IPv6 cannot exceed 15.

To configure inline active flow monitoring on all other MX Series routers (except for MX80 routers), EX Series switches, and T4000 routers with Type 5 FPC:

1. Enable inline active flow monitoring and specify the source address for the traffic.

```
[edit forwarding-options sampling instance instance-name family inet output]
user@host# set inline-jflow source address address
```

2. Specify the IP_FIX output format.

```
[edit forwarding-options sampling instance instance-name family inet output flow-server
address]
user@host# set version-ipfix template ipv4
```

3. Specify the output properties.

```
[edit services flow-monitoring]
user@host# set version-ipfix
```

The output format properties are common to other output formats and are described in “*Configuring Flow Aggregation to Use IPFIX Flow Templates*”.

The following is an example of the sampling configuration for an instance that supports inline active flow monitoring on **family inet** and PIC-based sampling on **family inet6**:

```
[edit forwarding-options]
sampling {
  instance {
    sample-ins1 {
      input {
        rate 1;
      }
      family inet {
        output {
          flow-server 2.2.2.2 {
            port 2055;
            version-ipfix {
              template {
                ipv4;
              }
            }
          }
        }
        inline-jflow {
          source-address 10.11.12.13;
        }
      }
    }
  }
}
```

```

family inet6 {
  output {
    flow-server 2.2.2.2 {
      port 2055;
      version-ipfix {
        template {
          ipv6;
        }
      }
    }
  }
  interface sp-0/1/0 {
    source-address 10.11.12.13;
  }
}
}
}

```

The following example shows the output format configuration:

```

services {
  flow-monitoring {
    version-ipfix {
      template ipv4 {
        flow-active-timeout 60;
        flow-inactive-timeout 60;
        ipv4-template;
        template-refresh-rate {
          packets 1000;
          seconds 10;
        }
      }
      option-refresh-rate {
        packets 1000;
        seconds 10;
      }
    }
  }
}
}

```

The following considerations apply to the inline flow-monitoring instance configuration:

- Sampling run-length and clip-size are not supported.
- For inline configurations, each family can support only one collector.



NOTE: On routers with Multiservices PICs or Multiservices DPCs, IPv4 and IPv6 fragments are processed accurately. The flow monitoring application creates two flows for every fragmented flow. The first fragment that has the complete Layer 4 information forms the first flow with 5-tuple data and subsequently, all the fragmented packets related to this flow form another flow with the Layer 4 fields set to zero.

- Related Documentation**
- *Configuring Inline Active Flow Monitoring on MX80 Routers*
 - *inline-jflow*

PART 3

Configuration Statements and Operational Commands

- Configuration Statements on page 23
- Operational Commands on page 49

CHAPTER 4

Configuration Statements

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[edit interfaces] Hierarchy Level

To configure flow monitoring and accounting interfaces, include the following statements at the **[edit interfaces]** hierarchy level:

```
[edit interfaces]
mo-fpc/pic/port {
  unit logical-unit-number {
    family inet {
      accounting {
        destination-class-usage;
        source-class-usage direction;
      }
    }
    address address {
      destination address;
    }
    filter {
      group filter-group-number;
      input filter-name;
      output filter-name;
    }
    receive-options-packets;
    receive-ttl-exceeded;
    sampling direction;
  }
}
multiservice-options {
  (core-dump | no-core-dump);
  (syslog | no-syslog);
  flow-control-options {
    down-on-flow-control;
    dump-on-flow-control;
    reset-on-flow-control;
  }
}
(at-fpc/pic/port | fe-fpc/pic/port | ge-fpc/pic/port) {
  passive-monitor-mode;
}
so-fpc/pic/port {
  unit logical-unit-number {
    passive-monitor-mode;
  }
}
```

- Related Documentation**
- [\[edit forwarding-options\] Hierarchy Level on page 24](#)
 - [\[edit services flow-monitoring\] Hierarchy Level](#)

[edit forwarding-options] Hierarchy Level

To configure flow monitoring and accounting properties, include the following statements at the **[edit forwarding-options]** hierarchy level:

```

[edit forwarding-options]
accounting name {
  output {
    aggregate-export-interval seconds;
    cflowd hostname {
      aggregation {
        autonomous-system;
        destination-prefix;
        protocol-port;
        source-destination-prefix {
          caida-compliant;
        }
        source-prefix;
      }
      autonomous-system-type (origin | peer);
      port port-number;
      version format;
    }
    flow-active-timeout seconds;
    flow-inactive-timeout seconds;
    interface interface-name {
      engine-id number;
      engine-type number;
      source-address address;
    }
  }
}
monitoring name {
  family family {
    output {
      cflowd hostname port port-number;
      export-format format;
      flow-active-timeout seconds;
      flow-export-destination {
        collector-pic;
      }
      flow-inactive-timeout seconds;
      interface interface-name {
        engine-id number;
        engine-type number;
        input-interface-index number;
        output-interface-index number;
        source-address address;
      }
    }
  }
}
next-hop-group group-names {
  interface interface-name {
    next-hop address;
  }
}
port-mirroring {
  input {
    rate rate;
    run-length number;
    maximum-packet-length bytes
  }
}

```

```

}
family (inet | inet6) {
    output {
        interface interface-name {
            next-hop address;
        }
        no-filter-check;
    }
}
traceoptions {
    file filename {
        files number;
        size bytes;
        (world-readable | no-world-readable);
    }
}
}
sampling {
    disable;
    sample-once;
    input {
        rate number;
        run-length number;
        max-packets-per-second number;
        maximum-packet-length bytes;
    }
    traceoptions {
        no-remote-trace;
        file filename <files number> <size bytes> <match expression> <world-readable |  
no-world-readable>;
    }
}
family (inet | inet6 | mpls) {
    disable;
    output {
        aggregate-export-interval seconds;
        flow-active-timeout seconds;
        flow-inactive-timeout seconds;
        extension-service service-name;
        flow-server hostname {
            aggregation {
                autonomous-system;
                destination-prefix;
                protocol-port;
                source-destination-prefix {
                    caida-compliant;
                }
                source-prefix;
            }
            autonomous-system-type (origin | peer);
            (local-dump | no-local-dump);
            port port-number;
            source-address address;
            version format;
            version9 {
                template template-name;
            }
        }
    }
}

```



```

    }
    interface interface-name {
        engine-id number;
        engine-type number;
        source-address address;
    }
    file {
        disable;
        filename filename;
        files number;
        size bytes;
        (stamp | no-stamp);
        (world-readable | no-world-readable);
    }
}
instance instance-name {
    disable;
    input {
        rate number;
        run-length number;
        max-packets-per-second number;
        maximum-packet-length bytes;
    }
    family (inet | inet6 | mpls) {
        disable;
        output {
            aggregate-export-interval seconds;
            flow-active-timeout seconds;
            flow-inactive-timeout seconds;
            extension-service service-name;
            flow-server hostname {
                aggregation {
                    autonomous-system;
                    destination-prefix;
                    protocol-port;
                    source-destination-prefix {
                        caida-compliant;
                    }
                    source-prefix;
                }
                autonomous-system-type (origin | peer);
                (local-dump | no-local-dump);
                port port-number;
                source-address address;
                version format;
                version9 {
                    template template-name;
                }
            }
        }
    }
    interface interface-name {
        engine-id number;
        engine-type number;
        source-address address;
    }
    inline-jflow {

```

```

        source-address address;
        flow-export-rate rate;
    }
}
}
}

```



NOTE: For the complete [edit forwarding-options] hierarchy, see the *Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices*. This section documents only the statements used in flow monitoring and accounting services.

- Related Documentation**
- [\[edit interfaces\] Hierarchy Level on page 24](#)
 - [\[edit services flow-monitoring\] Hierarchy Level](#)


address (Interfaces)

Syntax	<pre> address address { destination address; } </pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the interface address.
Options	<p>address—Address of the interface.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Junos OS Network Interfaces Library for Routing Devices</i> for other options not associated with flow monitoring. • Configuring Flow Monitoring on page 9 • Configuring Traffic Sampling

cflowd (Discard Accounting)

Syntax	<pre> cflowd <i>hostname</i> { aggregation { autonomous-system; destination-prefix; protocol-port; source-destination-prefix { caida-compliant; } source-prefix; } autonomous-system-type (origin peer); label-position { template <i>template-name</i>; } (local-dump no-local-dump); port <i>port-number</i>; source-address <i>address</i>; version <i>format</i>; } </pre>
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Collect an aggregate of sampled flows and send the aggregate to a specified host system that runs the collection utility cfdcollect.</p> <p>You can configure up to one version 5 and one version 8 flow format at the [edit forwarding-options accounting <i>name</i> output] hierarchy level.</p>
Options	<p>hostname—The IP address or identifier of the host system (the workstation running the cflowd utility).</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Enabling Flow Aggregation</i>

core-dump

Syntax	(core-dump no-core-dump);
Hierarchy Level	[edit interfaces <i>mo-fpc/pic/port</i> multiservice-options]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>A useful tool for isolating the cause of a problem. Core dumping is enabled by default. The directory /var/tmp contains core files. The Junos OS saves the current core file (0) and the four previous core files, which are numbered from 1 through 4 (from newest to oldest):</p> <div> NOTE: By default, all members of a configured user group (with read-only permissions) can access the core dump files and attach them to cases associated with JTAC.</div>
	<div><ul style="list-style-type: none">• core-dump—Enable the core dumping operation.• no-core-dump—Disable the core dumping operation.</div>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Flow Monitoring on page 9


destination (Interfaces)

Syntax	<code>destination address;</code>
Hierarchy Level	<p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i>],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> tunnel],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet address <i>address</i>]</p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>For CoS on ATM interfaces, specify the remote address of the connection.</p> <p>For point-to-point interfaces only, specify the address of the interface at the remote end of the connection.</p> <p>For tunnel and encryption interfaces, specify the remote address of the tunnel.</p>
Options	address —Address of the remote side of the connection.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Linear RED Profiles on ATM Interfaces</i> • <i>Multilink and Link Services Logical Interface Configuration Overview</i> • <i>Configuring Encryption Interfaces</i> • <i>Configuring Traffic Sampling</i> • Configuring Flow Monitoring on page 9 • <i>Configuring Unicast Tunnels</i>

engine-id (Forwarding Options)

Syntax	engine-id <i>number</i> ;
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output interface <i>interface-name</i>], [edit forwarding-options monitoring <i>name</i> output interface <i>interface-name</i>], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output interface <i>interface-name</i>], [edit forwarding-options sampling family (inet inet6 mpls) output interface <i>interface-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the engine ID number for flow monitoring and accounting services.
Options	<i>number</i> —Identity of accounting interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Traffic Sampling• Configuring Flow Monitoring on page 9• Configuring Discard Accounting

engine-type

Syntax	<code>engine-type <i>number</i>;</code>
Hierarchy Level	<p>[edit forwarding-options accounting <i>name</i> output interface <i>interface-name</i>],</p> <p>[edit forwarding-options monitoring <i>name</i> output interface <i>interface-name</i>],</p> <p>[edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output interface <i>interface-name</i>],</p> <p>[edit forwarding-options sampling family (inet inet6 mpls) output interface <i>interface-name</i>]</p>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	<p>Specify the engine type number for flow monitoring and accounting services. The engine type attribute refers to the type of the flow switching engine, such as the route processor or a line module. The configured engine type is inserted in output cflowd packets. The Source ID, a 32-bit value to ensure uniqueness for all flows exported from a particular device, is the equivalent of the engine type and the engine ID fields.</p>
<div>  <p>NOTE: You must configure a source address in the output interface statements. The interface-level statement of engine-type is added automatically but you may override this value with manually configured statements to track different flows with a single cflowd collector.</p> </div>	
Options	<i>number</i> —Platform-specific accounting interface type.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Traffic Sampling • Configuring Flow Monitoring on page 9 • Configuring Discard Accounting

export-format

Syntax	export-format <i>format</i> ;
Hierarchy Level	[edit forwarding-options monitoring name output]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Flow monitoring export format.
Options	<i>format</i> —Format of the flows. Values: 5 or 8 Default: 5
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• version• Exporting Flows on page 12

family (Monitoring)

```
Syntax  family inet {
        output {
            flow-active-timeout seconds;
            flow-inactive-timeout seconds;
            export-format format;
            cflowd hostname {
                aggregation {
                    autonomous-system;
                    destination-prefix;
                    protocol-port;
                    source-destination-prefix {
                        caida-compliant;
                    }
                    source-prefix;
                }
            }
            port port-number;
        }
        interface interface-name {
            engine-id number;
            engine-type number;
            input-interface-index number;
            output-interface-index number;
            source-address address;
        }
    }
```

Hierarchy Level [edit forwarding-options **monitoring** *name*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Specify input and output interfaces and properties for flow monitoring. Only IPv4 (**inet**) is supported.

The statements are explained separately.

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

Related Documentation

- [Configuring Flow Monitoring on page 9](#)

filter

Syntax	<pre>filter { input <i>filter-name</i>; output <i>filter-name</i>; group <i>filter-group-number</i>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Apply a firewall filter to an interface. You can also use filters for encrypted traffic.
Options	<p>group <i>filter-group-number</i>—Define an interface to be part of a filter group. The default filter group number is 0.</p> <p>input <i>filter-name</i>—Name of one filter to evaluate when packets are received on the interface.</p> <p>output <i>filter-name</i>—Name of one filter to evaluate when packets are transmitted on the interface.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Routing Policies, Firewall Filters, and Traffic Policers Feature Guide for Routing Devices</i> or the <i>Junos OS Administration Library for Routing Devices</i>• Configuring Flow Monitoring on page 9

flow-active-timeout

Syntax	<code>flow-active-timeout seconds;</code>
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output], [edit forwarding-options monitoring <i>name</i> output], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output], [edit forwarding-options sampling family (inet inet6 mpls) output], [edit services flow-monitoring version9], [edit services flow-monitoringversion-ipfix template <i>template-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Support at the [edit services flow-monitoring version-ipfix template <i>template-name</i>] hierarchy level added in Junos OS Release 10.2.
Description	Set the interval after which an active flow is exported.



NOTE: The router must include an Adaptive Services, Multiservices, or Monitoring Services PIC for this statement to take effect.

Options	seconds —Duration of the timeout period. Range: 60 through 1800 seconds (for forwarding-options configurations); 10 through 600 seconds (for services configurations) Default: 1800 seconds (for forwarding-options configurations); 60 seconds (for services configurations)
----------------	--



NOTE: In active flow monitoring, the cflowd or flow monitoring version 9 records are exported after a time period that is a multiple of 60 seconds and greater than or equal to the configured active timeout value. For example, if the active timeout value is 90 seconds, the cflowd or flow monitoring version 9 records are exported at 120-second intervals. If the active timeout value is 150 seconds, the cflowd or flow monitoring version 9 records are exported at 180-second intervals, and so forth.


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

Related Documentation	<ul style="list-style-type: none"> • Configuring Time Periods when Flow Monitoring is Active and Inactive on page 12 • Configuring the Version 9 Template Properties
------------------------------	--

flow-export-destination

Syntax	<pre>flow-export-destination { (cflowd-collector collector-pic); }</pre>
Hierarchy Level	[edit forwarding-options monitoring <i>group-name</i> family inet output]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure flow collection.
Options	<p>cflowd-collector—cflowd collector.</p> <p>collector-pic—Collector PIC.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Exporting Flows on page 12

flow-inactive-timeout

Syntax	<code>flow-inactive-timeout <i>seconds</i>;</code>
Hierarchy Level	<p>[edit forwarding-options accounting <i>name</i> output], [edit forwarding-options monitoring <i>name</i> output], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output], [edit forwarding-options sampling family (inet inet6 mpls) output], [edit services flow-monitoring version9], [edit services flow-monitoringversion-ipfix template <i>template-name</i>]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4. Support at the [edit services flow-monitoring version-ipfix template <i>template-name</i>] hierarchy level added in Junos OS Release 10.2.</p>
Description	Set the interval of inactivity that marks a flow inactive.
<div style="display: flex; align-items: center; margin-top: 20px;">  <div> <p>NOTE: The router must include an Adaptive Services, Multiservices, or Monitoring Services PIC for this statement to take effect.</p> </div> </div>	
Options	<p><i>seconds</i>—Duration of the timeout period.</p> <p>Range: 60 through 1800 seconds (for forwarding-options configurations); 10 through 600 seconds (for services configurations)</p> <p>Default: 1800 seconds (for forwarding-options configurations); 60 seconds (for services configurations)</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Time Periods when Flow Monitoring is Active and Inactive on page 12 • Configuring the Version 9 Template Properties

flow-table-size

Syntax	<pre>flow-table-size { ipv4-flow-table-size <i>units</i>; ipv6-flow-table-size <i>units</i>; ipv6-extended-attrib; }</pre>
Hierarchy Level	[edit chassis fpc <i>slot-number</i> inline-services]
Release Information	Statement introduced in Junos OS Release 12.1. ipv6-extended-attrib option added in Junos OS Release 14.2 for MX Series routers.
Description	Configure the size of hash tables for inline services sampling.
Options	The remaining statements are defined separately.


input-interface-index

Syntax	<pre>input-interface-index <i>number</i>;</pre>
Hierarchy Level	[edit forwarding-options monitoring <i>name</i> output interface <i>interface-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify a value for the input interface index that overrides the default supplied by SNMP.
Options	<i>number</i> —Input interface index value.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Flow Monitoring on page 9

interface (Accounting or Sampling)

Syntax	<pre>interface <i>interface-name</i> { <i>engine-id</i> <i>number</i>; <i>engine-type</i> <i>number</i>; <i>source-address</i> <i>address</i>; }</pre>
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output], [edit forwarding-options sampling family (inet inet6 mpls) output], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the output interface for monitored traffic.
Options	<i>interface-name</i> —Name of the interface. The remaining statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Discard Accounting • Configuring Traffic Sampling

ipv4-flow-table-size

Syntax	ipv4-flow-table-size <i>units</i> ;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> inline-services flow-table-size]
Description	Configure the size of the IPv4 flow table in units of 256K entries.
<div style="display: flex; align-items: center;">  <div> <p>NOTE: Any changes in the configured size of the flow has table sizes initiates an automatic reboot of the FPC.</p> </div> </div>	
Options	<i>units</i> —Number of 256K flow entries available for the IPv4 flow table. Range: 1 through 15 Default: 15 (3840K)
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Inline Active flow Monitoring on page 15

ipv6-flow-table-size

Syntax	ipv6-flow-table-size <i>units</i> ;
Hierarchy Level	[edit chassis fpc <i>slot-number</i> inline-services ipv6 flow-table-size]
Description	Configure the size of the IPv6 flow table in units of 256K entries.



NOTE: Any changes in the configured size of the flow has table sizes initiates an automatic reboot of the FPC.

Options	<i>units</i> —Number of 256K flow entries available for the IPv6 flow table. Range: 1 through 15 Default: 1K
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Inline Active flow Monitoring on page 15

monitoring

```
Syntax  monitoring name {
        family inet {
            output {
                cflowd hostname port-number;
                export-format cflowd-version-5;
                flow-active-timeout seconds;
                flow-export-destination {
                    (cflowd-collector | collector-pic);
                }
                flow-inactive-timeout seconds;
                interface interface-name {
                    number;
                    engine-type number;
                    input-interface-index number;
                    output-interface-index number;
                    source-address address;
                }
            }
        }
    }
```

Hierarchy Level [edit forwarding-options]

Release Information Statement introduced before Junos OS Release 7.4.

Description Specify the flow monitoring instance name and properties.

The statements are explained separately.

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

Related Documentation

- [Configuring Flow Monitoring on page 9](#)

multiservice-options

Syntax	<pre>multiservice-options { (core-dump no-core-dump); (syslog no-syslog); flow-control-options { down-on-flow-control; dump-on-flow-control; reset-on-flow-control; } }</pre>
Hierarchy Level	[edit interfaces <i>mo-fpc/pic/port</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	For flow-monitoring interfaces only, configure multiservice-specific interface properties. The statements are explained separately.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Flow Monitoring on page 9

output-interface-index

Syntax	<pre>output-interface-index <i>number</i>;</pre>
Hierarchy Level	[edit forwarding-options monitoring name output interface <i>interface-name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify a value for the output interface index that overrides the default supplied by SNMP.
Options	<i>number</i> —Output interface index value.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Flow Monitoring on page 9

output (Monitoring)

Syntax

```
output {
  cflowd hostname port port-number;
  export-format format;
  flow-active-timeout seconds;
  flow-export-destination {
    (cflowd-collector | collector-pic);
  }
  flow-inactive-timeout seconds;
  interface interface-name {
    engine-id number;
    engine-type number;
    input-interface-index number;
    output-interface-index number;
    source-address address;
  }
}
```

Hierarchy Level [edit forwarding-options [monitoring](#) name family inet]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure cflowd, output interfaces, and flow properties.

The statements are explained separately.

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

Related Documentation

- [Configuring Flow Monitoring on page 9](#)

port (Flow Monitoring)

Syntax	<code>port <i>port-number</i>;</code>
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output <code>cflowd <i>hostname</i></code>], [edit forwarding-options <code>monitoring <i>name</i> family inet output cflowd <i>hostname</i></code>], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output flow-server <i>hostname</i>], [edit forwarding-options sampling family (inet inet6 mpls) output flow-server <i>hostname</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the User Datagram Protocol (UDP) port number on the cflowd host system or flow server.
Options	<i>port-number</i> —Any valid UDP port number on the host system.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Enabling Flow Aggregation</i>

sampling (Interfaces)

Syntax	<code>sampling <i>direction</i>;</code>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Configure the direction of traffic to be sampled.
Options	<i>direction</i> can be one of the following: <i>input</i> —Configure at least one expected ingress point. <i>output</i> —Configure at least one expected egress point. <i>input output</i> —On a single interface, configure at least one expected ingress point and one expect egress point.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Junos OS Services Interfaces Library for Routing Devices</i>• Configuring Flow Monitoring on page 9

source-address (Forwarding Options)

Syntax	<code>source-address address;</code>
Hierarchy Level	[edit forwarding-options accounting <i>name</i> output <code>interface interface-name</code>], [edit forwarding-options <code>monitoring name family family</code> inet <code>output interface interface-name</code>], [edit forwarding-options sampling instance <i>instance-name</i> family (inet inet6 mpls) output <code>interface interface-name</code>], [edit forwarding-options sampling family (inet inet6 mpls) output <code>interface interface-name</code>], [edit forwarding-options sampling instance <i>instance-name</i> family inet output inline-jflow]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the source address for monitored packets.
Options	<i>address</i> —Interface source address.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring Discard Accounting</i> • Configuring Flow Monitoring on page 9 • <i>Configuring Traffic Sampling</i>

syslog

Syntax	<code>(syslog no-syslog);</code>
Hierarchy Level	[edit interfaces <i>mo-fpc/pic/port</i> <code>multiservice-options</code>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	System logging is enabled by default. The system log information of the Monitoring Services PIC is passed to the kernel for logging in the <code>/var/log</code> directory. <ul style="list-style-type: none"> • syslog—Enable PIC system logging. • no-syslog—Disable PIC system logging.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Flow Monitoring on page 9

unit

Syntax `unit logical-unit-number {
 family inet {
 address address {
 destination destination-address;
 }
 filter {
 group filter-group-number;
 input filter-name;
 output filter-name;
 }
 sampling direction;
 }
}`

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure a logical interface on the physical device. You must configure a logical interface to be able to use the physical device.

Options *logical-unit-number*—Number of the logical unit.

Range: 0 through 16,384

The remaining statements are explained separately.

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

Related Documentation

- *Junos OS Network Interfaces Library for Routing Devices* for other statements that do not affect services interfaces.
- *Junos OS Network Interfaces Library for Routing Devices*

CHAPTER 5

Operational Commands

- `show services accounting aggregation`
- `show services accounting aggregation template`
- `show services accounting errors`
- `show services accounting flow`
- `show services accounting flow-detail`
- `show services accounting memory`
- `show services accounting packet-size-distribution`
- `show services accounting status`
- `show services accounting usage`

show services accounting aggregation

Syntax	<pre>show services accounting aggregation <i>aggregation-type</i> <<i>aggregation-value</i>> <detail extensive terse> <limit <i>limit-value</i>> < name <i>service-name</i>> <order (bytes packets)></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display information about the aggregated active flows being processed by the accounting service.
Options	<p><i>aggregation-type</i> <<i>aggregation-value</i>>—Display information for a particular aggregation type and optional value:</p> <ul style="list-style-type: none"> as <<i>source-as-value</i> <i>destination-as-value</i> <i>input-snmp-interface-index-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by autonomous system (AS). destination-prefix <<i>destination-prefix-value</i> <i>destination-as-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by destination prefix. protocol-port <<i>protocol-value</i> <i>source-port-value</i> <i>destination-port-value</i>>—Aggregate by protocol and port. source-destination-prefix <<i>source-prefix-value</i> <i>destination-prefix-value</i> <i>destination-as-value</i> <i>source-as-value</i> <i>input-snmp-interface-index-value</i> <i>output-snmp-interface-index-value</i>>—Aggregate by source and destination prefix. source-prefix <<i>source-prefix-value</i> <i>source-as-value</i> <i>input-snmp-interface-index-value</i>>—Aggregate by source prefix. <p>detail extensive terse—(Optional) Display the specified level of output.</p> <p>limit <i>limit-value</i>—(Optional) Limit the display output to this number of flows. The default is no limit.</p> <p>name <i>service-name</i>—(Optional) Display information about the aggregated flows for a particular service name.</p> <p>order (bytes packets)—(Optional) Display the flow with the ordering of the highest number, either by byte count or by packet count.</p>
Additional Information	For information about aggregation configuration options, see the <i>Junos OS Services Interfaces Library for Routing Devices</i> .
Required Privilege Level	view
List of Sample Output	show services accounting aggregation protocol-port detail on page 52 show services accounting aggregation source-destination-prefix on page 52

[show services accounting aggregation source-destination- prefix order packet detail on page 52](#)

[show services accounting aggregation source-destination- prefix extensive limit on page 53](#)

[show services accounting aggregation source-destination-prefix name terse on page 53](#)

Output Fields [Table 3 on page 51](#) lists the output fields for the **show services accounting aggregation** command. Output fields are listed in the approximate order in which they appear.

Table 3: show services accounting aggregation Output Fields

Field Name	Field Description
Service Accounting interface	Name of the service accounting interface.
Local interface index	Index corresponding to the service accounting interface.
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.
Protocol	Protocol identifier and number.
Source Port	Source port identifier and number.
Destination Port	Destination port identifier and number.
Source-AS	Source autonomous system (AS) number.
Destination-AS	Destination AS number.
Source Prefix	Source prefix.
Destination Prefix	Destination prefix.
Source address	Source address.
Source prefix length	Source prefix length.
Destination address	Destination address.
Destination prefix length	Destination prefix length.
Input SNMP interface index	SNMP index of the interface the packet came in on.
Output SNMP interface index	SNMP index of the interface the packet went out on.

Table 3: show services accounting aggregation Output Fields (*continued*)

Field Name	Field Description
Start time	Actual time when the packet in this aggregation was first seen.
End time	Actual time when the packet in this aggregation was last seen.
Flow count	Number of flows in the aggregation.
Packet count	Number of packets in the aggregation.
Byte count	Number of bytes in the aggregation.

Sample Output

show services accounting aggregation protocol-port detail

```

user@host> show service accounting aggregation protocol-port detail
Service Accounting interface: mo-2/0/0, Local interface index: 468
Service name: (default sampling)
  Protocol: 6, Source port: 20, Destination port: 20
  Start time: 442349, End time: 6425714
  Flow count: 194, Packet count: 4294964388, Byte count: 4294781184

  Protocol: 0, Source port: 0, Destination port: 0
  Start time: 442349, End time: 6425749
  Flow count: 204, Packet count: 4294964324, Byte count: 4294777088

  Protocol: 17, Source port: 123, Destination port: 123
  Start time: 442364, End time: 6425784
  Flow count: 186, Packet count: 4294964152, Byte count: 4294766080

```

show services accounting aggregation source-destination-prefix

```

user@host> show service accounting aggregation source-destination-prefix
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting
Source          Destination    Input          Output          Flow    Packet
Byte           prefix        interface      interface      count   count
prefix        count
11.1.0.0/20    40.0.0.0/24   ge-5/0/1.0    ge-5/0/0.0     256     491761
31472704
11.1.0.0/20    40.0.1.36/32  ge-5/0/1.0    ge-5/0/0.0     1
1926          123264
11.1.0.0/20    40.0.1.59/32  ge-5/0/1.0    ge-5/0/0.0     1
1926          123264
11.1.0.0/20    40.0.3.63/32  ge-5/0/1.0    ge-5/0/0.0     1
1925          123200
11.1.0.0/20    40.0.3.32/32  ge-5/0/1.0    ge-5/0/0.0     1
1925

```

show services accounting aggregation source-destination- prefix order packet detail

```

user@host> show service accounting aggregation source-destination-prefix order packet detail
name t2 input-snmp-interface-index 538

```

```

Service Accounting interface: mo-2/0/0, Local interface index: 468
Service name: t2
Source      Destination  Input SNMP  Output SNMP  Flow  Packet  Byte
Prefix      Prefix      Index      Index      Count Count   Count
11.1.1.2/20 30.0.167.1/0 538        432         1     60     46483
11.1.1.2/20 30.0.168.1/0 538        432         1     60     5191
11.1.1.2/20 30.0.154.1/0 538        432         2     60     45504
11.1.1.2/20 30.0.76.1/0  538        432         1     60     42177
11.1.1.2/20 30.0.149.1/0 538        432         1     60     49184
11.1.1.2/20 30.0.113.1/0 538        432         2     60     48757

```

show services accounting aggregation source-destination- prefix extensive limit

```

user@host> show service accounting aggregation source-destination-prefix name t2 extensive
limit 3

```

```

Service Accounting interface: mo-2/0/0, Local interface index: 542
Service name: t2

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 44.200.176.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 5340

```

```

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 45.243.160.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 5490

```

```

Source address: 11.1.1.2, Source prefix length: 20
Destination address: 45.162.160.1, Destination prefix length: 0
Input SNMP interface index: 24, Output SNMP interface index: 26
Source-AS: 69, Destination-AS: 69
Start time: Fri Feb 21 14:16:57 2003, End time: Fri Feb 21 14:22:50 2003
Flow count: 0, Packet count: 6, Byte count: 4079

```

show services accounting aggregation source-destination-prefix name terse

```

user@host> show service accounting aggregation source-destination-prefix name T3 terse
Service Accounting interface: rsp0, Local interface index: 171
Service name: T3
Interface state: Accounting
Source      Destination  Input      Output      Flow  Packet
prefix      prefix      interface  interface   count count
              count
11.1.0.0/20 50.0.0.0/24  ge-5/0/1.0 ge-5/0/0.0  256   639822
              40948608
11.1.0.0/20 50.0.2.67/32 ge-5/0/1.0  ge-5/0/0.0    1
2485          159040
11.1.0.0/20 50.0.2.92/32 ge-5/0/1.0  ge-5/0/0.0    1
2485

```

show services accounting aggregation template

Syntax	show services accounting aggregation template <template-name <i>template-name</i>>
Release Information	Command introduced in Junos OS Release 8.3.
Description	Display information for flow aggregation version 9 templates.
Options	<template-name <i>template-name</i>> —(Optional) Display information for the specified template only.
Required Privilege Level	view
List of Sample Output	show services accounting aggregation template on page 54
Output Fields	Table 4 on page 54 lists the output fields for the show services accounting aggregation template command. Output fields are listed in the approximate order in which they appear.

Table 4: show services accounting aggregation template Output Fields

Field Name	Field Description
MPLS Label 1	Position of first MPLS label.
MPLS Label 2	Position of second MPLS label.
MPLS Label 3	Position of third MPLS label.
MPLS Top Level Address	Outer top label FEC IP address.
Packet Count	Number of packets sent.

Sample Output

show services accounting aggregation template

```

user@host> show services accounting aggregation template template-name mpls
MPLS label 1: 299808, MPLS label 2: 0, MPLS label 3: 0
Source address: 11.1.1.2, Destination address: 10.255.15.22, Top Label Address:
22.15.255.10
Source port: 0, Destination port: 0
Protocol: 61, TOS: 0, TCP flags: 0
Source mask: 24, Destination mask: 32
Input SNMP interface index: 503, Output SNMP interface index: 505
Start time: 40780, End time: 157330
Packet count: 3949198, Byte count: 181663062

```

show services accounting errors

Syntax	show services accounting errors <inline-jflow name (* all <i>service-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display active flow error statistics.
Options	<p>none—Display error statistics for all services accounting instances.</p> <p>inline-jflow fpc-slot <i>slot-number</i>—(Optional) Display error statistics for inline jflow.</p> <p>name (* all <i>service-name</i>)—(Optional) Display active flow error statistics. Use a wildcard character, specify all services, or provide a specific service name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • show services accounting flow on page 59
List of Sample Output	<p>show services accounting errors (Monitoring PIC interface) on page 56</p> <p>show services accounting errors (Service PIC interface) on page 57</p> <p>show services accounting errors inline-jflow fpc-slot slot-number (when only IPv6 is configured) on page 57</p> <p>show services accounting errors inline-jflow fpc-slot slot-number (when both IPv4 and IPv6 are configured) on page 57</p> <p>show services accounting errors inline-jflow (MX80 Router when both IPv4 and IPv6 are configured) on page 57</p>
Output Fields	<p>Table 5 on page 55 lists the output fields for the show services accounting errors command. Output fields are listed in the approximate order in which they appear.</p>

Table 5: show services accounting errors Output Fields

Field	Field Description
Service Accounting interface	Name of the service accounting interface.
Local interface index	Index counter of the local interface.
FPC slot	Slot number of the FPC for which the flow information is displayed. (Available only when the inline-jflow fpc-slot slot-number option is used.)
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.

Error Information

Table 5: show services accounting errors Output Fields (*continued*)

Field	Field Description
Packets dropped (no memory)	Number of packets dropped because of memory shortage.
Packets dropped (not IP)	Number of non-IP packets dropped.
Packets dropped (not IPv4)	Number of packets dropped because they failed the IPv4 version check.
Packets dropped (header too small)	Number of packets dropped because the packet length or IP header length was too small.
Memory allocation failures	Number of flow record memory allocation failures. A small number reflects failures to replenish the free list. A large number indicates the monitoring station is almost out of memory space.
Memory free failures	Number of flow record memory free failures.
Memory free list failures	Number of flow records received from the free list that failed. Memory is nearly exhausted, or too many new flows greater than 128 KB are being created per second.
Memory overload	Whether the memory has been overloaded. The response can be Yes or No .
PPS overload	Whether the PIC is receiving more packets per second than the configured threshold. The response can be Yes or No .
BPS overload	Whether the PIC is receiving more bits per second than the configured threshold. The response can be Yes or No .
Flow Creation Failures	Number of times flow creation failed.
Route Record Lookup Failures	Number of times the route record lookup failed.
AS Lookup Failures	Number of times autonomous system lookup failed.
Export Packet Failures	Number of times packet export failed.

Sample Output

show services accounting errors (Monitoring PIC interface)

```

user@host> show services accounting errors
Service Accounting interface: mo-1/1/0, Local interface index: 15
Service name: (default sampling)
Error information
  Packets dropped (no memory): 0, Packets dropped (not IP): 0
  Packets dropped (not IPv4): 0, Packets dropped (header too small): 0
  Memory allocation failures: 0, Memory free failures: 0
  Memory free list failures: 0
  Memory overload: No, PPS overload: No, BPS overload: No

```

Sample Output

show services accounting errors (Service PIC interface)

```

user@host> show services accounting errors
Service Accounting interface: sp-0/1/0
Service name: (default sampling)
Error information
  Service sets dropped: 0, Active timeout failures: 0
  Export packet failures: 0, Flow creation failures: 0
  Memory overload: No

Service Accounting interface: sp-1/0/0
Service name: (default sampling)
Error information
  Service sets dropped: 0, Active timeout failures: 0
  Export packet failures: 0, Flow creation failures: 0
  Memory overload: No

```

show services accounting errors inline-jflow fpc-slot slot-number (when only IPv6 is configured)

```

user@host> show services accounting errors inline-jflow fpc-slot 5
Error information
  FPC Slot: 5
  Flow Creation Failures: 0
  Route Record Lookup Failures: 0, AS Lookup Failures: 0
  Export Packet Failures: 0
  Memory Overload: No, Memory Alloc Fail Count: 0

```

show services accounting errors inline-jflow fpc-slot slot-number (when both IPv4 and IPv6 are configured)

```

user@host> show services accounting errors inline-jflow fpc-slot 5
Error information
  FPC Slot: 5
  Flow Creation Failures: 0
  Route Record Lookup Failures: 0, AS Lookup Failures: 0
  Export Packet Failures: 0
  Memory Overload: No, Memory Alloc Fail Count: 0

IPv4:
IPv4 Flow Creation Failures: 0
IPv4 Route Record Lookup Failures: 0, IPv4 AS Lookup Failures: 0
IPv4 Export Packet Failures: 0

IPv6:
IPv6 Flow Creation Failures: 0
IPv6 Route Record Lookup Failures: 0, IPv6 AS Lookup Failures: 0
IPv6 Export Packet Failures: 0

```

show services accounting errors inline-jflow (MX80 Router when both IPv4 and IPv6 are configured)

```

user@host> show services accounting errors inline-jflow
Error information
  TFEB Slot: 0
  Flow Creation Failures: 0
  Route Record Lookup Failures: 0, AS Lookup Failures: 0
  Export Packet Failures: 0
  Memory Overload: No

IPv4:
IPv4 Flow Creation Failures: 0

```

IPv4 Route Record Lookup Failures: 0, IPv4 AS Lookup Failures: 0
IPv4 Export Packet Failures: 0

IPv6:

IPv6 Flow Creation Failures: 0
IPv6 Route Record Lookup Failures: 0, IPv6 AS Lookup Failures: 0
IPv6 Export Packet Failures: 0

show services accounting flow

Syntax	<code>show services accounting flow</code> <code><inline-jflow logical-system name (* all service-name)></code>
Release Information	Command introduced before Junos OS Release 7.4. Junos OS Release 10.0 added the capability to display output from multiple sampling instances.
Description	Display active flow statistics.
Options	<p>none—Display active flow statistics for all service instances.</p> <p>logical-system (all logical-system)—(Optional) Display active flow statistics for the specified logical system or all logical systems on the device.</p> <p>inline-jflow (fpc-slot slot-number)—(Optional) Display inline flow statistics for the specified FPC.</p> <p>name (* all service-name)—(Optional) Display services accounting active flow statistics. Use a wildcard character, specify all services, or provide a specific service name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show services accounting status on page 73
List of Sample Output	show services accounting flow (flow aggregation v5/v8 configuration) on page 60 show services accounting flow (flow aggregation v9 configuration) on page 60 show services accounting flow name on page 61 show services accounting flow name all on page 61 show services accounting flow (multiple sampling instances) on page 62 show services accounting flow inline-jflow fpc-slot slot-number (for IPv4 flow) on page 62 show services accounting flow inline-jflow fpc-slot slot-number (with IPv4 and IPv6 Configuration) on page 62 show services accounting flow inline-jflow (MX80 Router with IPv4 and IPv6 Configuration) on page 62
Output Fields	<p>Table 6 on page 59 lists the output fields for the show services accounting flow command. Output fields are listed in the approximate order in which they appear.</p>

Table 6: show services accounting flow Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Local interface index	Index counter of the local interface.

Table 6: show services accounting flow Output Fields (*continued*)

Output Field	Output Field Description
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit forwarding-options sampling-level] hierarchy level.
Flow Information	
FPC Slot	Slot number of the FPC for which the flow information is displayed. (Available only when the inline-jflow fpc-slot slot-number option is used.)
Flow packets	Number of packets received by an operational PIC.
Flow bytes	Number of bytes received by an operational PIC.
Flow packets 10-second rate	Number of packets per second handled by the PIC and displayed as a 10-second average.
Flow bytes 10-second rate	Number of bytes per second handled by the PIC and displayed as a 10-second average.
Active flows	Number of currently active flows tracked by the PIC.
Total flows	Total number of flows received by an operational PIC.
Flows exported	Total number of flows exported by an operational PIC.
Flows packets exported	Total number of cflowd packets exported by an operational PIC.
Flows inactive timed out	Total number of flows that are exported because of inactivity.
Flows active timed out	Total number of long-lived flows that are exported because of an active timeout.

Sample Output

show services accounting flow (flow aggregation v5/v8 configuration)

```

user@host> show services accounting flow
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting
Flow information
  Flow packets: 87168293, Flow bytes: 5578770752
  Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928962
  Active flows: 1000, Total flows: 2000
  Flows exported: 19960, Flows packets exported: 582
  Flows inactive timed out: 1000, Flows active timed out: 29000

```

show services accounting flow (flow aggregation v9 configuration)

```

user@host> show services accounting flow
Flow information
  Service Accounting interface: sp-7/1/0, Local interface index: 149

```

```

Flow packets: 0, Flow bytes: 0
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 0
Flows exported: 0, Flows packets exported: 1
Flows inactive timed out: 0, Flows active timed out: 0

```

show services accounting flow name

```

user@host> show services accounting flow count2
Service Accounting interface: mo-1/1/0, Local interface index: 15
Service name: count2
Flow information
Flow packets: 0, Flow bytes: 0
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 0
Flows exported: 0, Flows packets exported: 0
Flows inactive timed out: 0, Flows active timed out: 0

```

show services accounting flow name all

```

user@host> show services accounting flow name all
Service Accounting interface: rsp0, Local interface index: 171
Service name: T2
Interface state: Accounting
Flow information
Flow packets: 37609891, Flow bytes: 2407033024
Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928953
Active flows: 1000, Total flows: 1000
Flows exported: 6705, Flows packets exported: 198
Flows inactive timed out: 0, Flows active timed out: 13000

Service Accounting interface: rsp0, Local interface index: 171
Service name: T3
Interface state: Accounting
Flow information
Flow packets: 37750807, Flow bytes: 2416051712
Flow packets 10-second rate: 45762, Flow bytes 10-second rate: 2928940
Active flows: 1000, Total flows: 1000
Flows exported: 13437, Flows packets exported: 378
Flows inactive timed out: 0, Flows active timed out: 13000

Service Accounting interface: rsp0, Local interface index: 171
Service name: T4
Interface state: Accounting
Flow information
Flow packets: 0, Flow bytes: 0
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 0
Flows exported: 0, Flows packets exported: 0
Flows inactive timed out: 0, Flows active timed out: 0

Service Accounting interface: rsp0, Local interface index: 171
Service name: count1
Interface state: Accounting
Flow information
Flow packets: 0, Flow bytes: 0
Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
Active flows: 0, Total flows: 0
Flows exported: 0, Flows packets exported: 0
Flows inactive timed out: 0, Flows active timed out: 0

```

show services accounting flow (multiple sampling instances)

```
user@host> show services accounting flow
Flow information
  Service Accounting interface: sp-2/0/0, Local interface index: 215
  Flow packets: 9867, Flow bytes: 631488
  Flow packets 10-second rate: 0, Flow bytes 10-second rate: 628
  Active flows: 2, Total flows: 10
  Flows exported: 4028, Flows packets exported: 6150
  Flows inactive timed out: 8, Flows active timed out: 4026

  Service Accounting interface: sp-2/1/0, Local interface index: 223
  Flow packets: 0, Flow bytes: 0
  Flow packets 10-second rate: 0, Flow bytes 10-second rate: 0
  Active flows: 0, Total flows: 0
  Flows exported: 0, Flows packets exported: 1
  Flows inactive timed out: 0, Flows active timed out: 0
```

show services accounting flow inline-jflow fpc-slot slot-number (for IPv4 flow)

```
user@host> show services accounting flow inline-jflow fpc-slot 5
Flow information
  FPC Slot: 5
  Flow Packets: 0, Flow Bytes: 0
  Active Flows: 0, Total Flows: 0
  Flows Exported: 0, Flow Packets Exported: 0
  Flows Inactive Timed Out: 0, Flows Active Timed Out: 0
```

show services accounting flow inline-jflow fpc-slot slot-number (with IPv4 and IPv6 Configuration)

```
user@host> show services accounting flow inline-jflow fpc-slot 5
Flow information
  FPC Slot: 5
  Flow Packets: 0, Flow Bytes: 0
  Active Flows: 0, Total Flows: 0
  Flows Exported: 0, Flow Packets Exported: 0
  Flows Inactive Timed Out: 0, Flows Active Timed Out: 0

  IPv4 Flows:
  IPv4 Flow Packets: 0, IPv4 Flow Bytes: 0
  IPv4 Active Flows: 0, IPv4 Total Flows: 0
  IPv4 Flows Exported: 0, IPv4 Flow Packets exported: 0
  IPv4 Flows Inactive Timed Out: 0, IPv4 Flows Active Timed Out: 0

  IPv6 Flows:
  IPv6 Flow Packets: 0, IPv6 Flow Bytes: 0
  IPv6 Active Flows: 0, IPv6 Total Flows: 0
  IPv6 Flows Exported: 0, IPv6 Flow Packets Exported: 0
  IPv6 Flows Inactive Timed Out: 0, IPv6 Flows Active Timed Out: 0
```

show services accounting flow inline-jflow (MX80 Router with IPv4 and IPv6 Configuration)

```
user@host> show services accounting flow inline-jflow
Flow information
  TFEB Slot: 0
  Flow Packets: 0, Flow Bytes: 0
  Active Flows: 0, Total Flows: 0
  Flows Exported: 0, Flow Packets Exported: 0
  Flows Inactive Timed Out: 0, Flows Active Timed Out: 0

  IPv4 Flows:
```

IPv4 Flow Packets: 0, IPv4 Flow Bytes: 0
IPv4 Active Flows: 0, IPv4 Total Flows: 0
IPv4 Flows Exported: 0, IPv4 Flow Packets exported: 0
IPv4 Flows Inactive Timed Out: 0, IPv4 Flows Active Timed Out: 0

IPv6 Flows:
IPv6 Flow Packets: 0, IPv6 Flow Bytes: 0
IPv6 Active Flows: 0, IPv6 Total Flows: 0
IPv6 Flows Exported: 0, IPv6 Flow Packets Exported: 0
IPv6 Flows Inactive Timed Out: 0, IPv6 Flows Active Timed Out: 0

show services accounting flow-detail

Syntax `show services accounting flow-detail`
 `<detail | extensive | terse>`
 `<filters>`
 `<limit limit-value>`
 `<name (* | all | service-name)>`
 `<order (bytes | packets)>`

Release Information Command introduced before Junos OS Release 7.4.

Description Display information about the flows being processed by the accounting service.

Options `detail | extensive | terse`—(Optional) Display the specified level of output.

filters—(Optional) Filter the display output of the currently active flow records. The following filters query actively changing data structures and result in different results for multiple invocations:

- **destination-as**—Display flow records filtered by destination autonomous system information.
- **destination-port**—Display flow records filtered by destination port information.
- **destination-prefix**—Display flow records filtered by destination prefix information.
- **input-snmp-interface-index**—Display flow records filtered by SNMP input interface index information.
- **output-snmp-interface-index**—Display flow records filtered by SNMP output interface index information.
- **proto**—Display flow records filtered by protocol type.
- **source-as**—Display flow records filtered by source autonomous system information.
- **source-port**—Display flow records filtered by source port information.
- **source-prefix**—Display flow records filtered by source prefix information.
- **tos**—Display flow records filtered by type of service classification.

limit *limit-value*—(Optional) Limit the display output to the specified number of flows. The default is no limit.

name (* | all | *service-name*)—(Optional) Display information about the flows being processed. Use a wildcard character, specify all services, or provide a specific services name.

order (bytes | packets)—(Optional) Display the flow with the ordering of the highest number, either by byte count or by packet count.

Additional Information When no PIC is active, or when no route record has been downloaded from the PIC, this command reports no flows, even though packets are being sampled. This command

displays information about two concurrent sessions only. If a third session is attempted, the command pauses with no output until one of the previous sessions is completed.

Required Privilege Level view

List of Sample Output [show services accounting flow-detail on page 66](#)
[show services accounting flow-detail limit on page 67](#)
[show services accounting flow-detail name extensive on page 67](#)
[show services accounting flow-detail limit order bytes on page 67](#)
[show services accounting flow-detail source-port on page 68](#)

Output Fields [Table 7 on page 65](#) lists the output fields for the **show services accounting flow-detail** command. Output fields are listed in the approximate order in which they appear.

Table 7: show services accounting flow-detail Output Fields

Field Name	Field Description	Output Level
Service Accounting interface	Name of the service accounting interface.	All levels
Service name	Name of a service that was configured at the [edit forwarding-options accounting] hierarchy level. The default display, (default sampling) , indicates the service was configured at the [edit forwarding-options sampling] hierarchy level.	All levels
Local interface index	Index counter of the local interface.	All levels
TOS	Type-of-service value from the IP header.	extensive
Input SNMP interface index	SNMP index of the interface on which the packet came in.	extensive
Output SNMP interface index	SNMP index of the interface on which the packet went out.	extensive
Source-AS	Source AS number.	extensive
Destination-AS	Destination AS number.	extensive
Protocol	Name of the protocol used for the packet flow from the corresponding source address.	All levels
Input interface	Interface on which the packets were received.	All levels
Output interface	Interface on which the packets were transmitted.	All levels
TCP flags	Number of TCP header flags detected in the flow.	extensive
Source address	Address where the flow originated.	All levels
Source port	Name of the source port.	All levels

Table 7: show services accounting flow-detail Output Fields (*continued*)

Field Name	Field Description	Output Level
Source prefix length	Source prefix length.	extensive
Destination address	Address where the flow is sent.	All levels
Destination prefix length	Destination prefix length.	extensive
Destination port	Name of the destination port.	All levels
Start time	Actual time when the packet in this aggregation was first seen.	detail extensive
End time	Actual time when the packet in this aggregation was last seen.	detail extensive
Packet count	Number of packets in the aggregation.	All levels
Byte count	Number of bytes in the aggregation.	All levels
Time since last active timeout	Amount of time elapsed since the last active timeout, in the format <i>hh:mm:ss</i> .	None specified
Packet count for last active timeout	Number of packets in the aggregation since the last active timeout.	None specified
Byte count for last active timeout	Number of bytes in the aggregation since the last active timeout.	None specified

Sample Output

show services accounting flow-detail

In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```

user@host> show services accounting flow-detail
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting

```

Protocol	Input interface	Source address	Source port	Output interface...
tcp(6)	ge-5/0/1.0	11.1.1.2	0	ge-5/0/0.0
tcp(6)	ge-5/0/1.0	11.1.1.2	0	ge-5/0/0.0

Destination address	Destination port	Packet count	Byte count	Time since last active timeout...
40.0.3.149	0	2660	170240	00:00:58
40.0.3.138	0	2660	170240	00:00:58

Packet count for last active timeout	Byte count for last active timeout
2805	179520
2805	179520

show services accounting flow-detail limit

In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```
user@host> show services accounting flow-detail limit 1
Service Accounting interface: rsp0, Local interface index: 171
Service name: (default sampling)
Interface state: Accounting
Protocol   Input          Source          Source   Output
           interface    address         port     interface...
tcp(6)     ge-5/0/1.0    11.1.1.2        0        ge-5/0/0.0

Destination      Destination      Packet   Byte   Time since last
address          port            count    count  active timeout...
40.0.3.149              0             2158    138112 00:00:47

Packet count for   Byte count for
last active timeout last active timeout
                2827                180928
```

show services accounting flow-detail name extensive

```
user@host> show services accounting flow-detail name cf-2 extensive
Service Accounting interface: mo-0/2/0, Local interface index: 145
Service name: cf-2
  TOS: 0, Protocol: udp(17), TCP flags: 0
  Source address: 10.10.10.1, Source prefix length: 0, Destination address:
20.20.20.20,
  Destination prefix length: 0, Source port: 1173, Destination port: 69
  Input SNMP interface index: 65, Output SNMP interface index: 0, Source-AS: 0,
  Destination-AS: 0
  Start time: 62425, End time: 635265, Packet count: 165845, Byte count: 9453165
```

show services accounting flow-detail limit order bytes

The output of the following command is displayed over 141 columns, not the standard 80 columns. In this sample, the output is split into three sections, with ellipses (...) indicating where the sections are continued.

```
user@host> show services accounting flow-detail limit 5 order bytes
Service Accounting interface: mo-2/0/0, Local interface index: 356
Service name: (default sampling)
Protocol   Input          Source          Source   Output
           interface    address         port     interface...
icmp(1)    ge-2/3/0.0    11.1.1.2        0        .local.
icmp(1)    ge-2/3/0.0    11.1.1.2        0        .local.
icmp(1)    ge-2/3/0.0    11.1.1.2        0        .local.
icmp(1)    ge-2/3/0.0    11.1.1.2        0        .local.
icmp(1)    ge-2/3/0.0    11.1.1.2        0        .local.

Destination      Destination      Packet   Byte   Time since last
address          port            count    count  active timeout...
51.88.128.2              0             16     12148  Not applicable
52.78.144.2              0             16     15229  Not applicable
51.147.192.2             0             16     13296  Not applicable
51.136.16.2              0             16     13924  Not applicable
50.214.48.2              0             16     13428  Not applicable

Packet count for   Byte count for
```

last active timeout	last active timeout
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable
Not applicable	Not applicable

show services accounting flow-detail source-port

```
user@host> show services accounting flow-detail name cf-2 detail source-port 1173
Service Accounting interface: mo-0/2/0, Local interface index: 145
Service name: cf-2
  Protocol: udp(17), Source address: 10.10.10.1, Source port: 1173, Destination
address:
20.20.20.20, Destination port: 69
  Start time: 62425, End time: 811115, Packet count: 142438, Byte count: 8118966
```

show services accounting memory

Syntax	show services accounting memory
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display memory and flow record statistics.
Options	This command has no options.
Required Privilege Level	view
List of Sample Output	show services accounting memory (Monitoring PIC interface) on page 69 show services accounting memory (Service PIC interface) on page 70
Output Fields	Table 8 on page 69 lists the output fields for the show services accounting memory command. Output fields are listed in the approximate order in which they appear.

Table 8: show services accounting memory Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Memory Utilization	
Local interface index	Index counter of the local interface.
Allocation count	Number of flow records allocated.
Free count	Number of flow records freed.
Maximum allocated	Maximum number of flow records allocated since the monitoring station booted. This number represents the peak number of flow records allocated at a time.
Allocations per second	Flow records allocated per second during the last statistics interval on the PIC.
Frees per second	Flow records freed per second during the last statistics interval on the PIC.
Total memory used	Total amount of memory currently used (in bytes).
Total memory free	Total amount of memory currently free (in bytes).

Sample Output

show services accounting memory (Monitoring PIC interface)

```
user@host> show services accounting memory
Service Accounting interface: mo-2/0/0, Local interface index: 468
Memory utilization
```

```
Allocation count: 437340, Free count: 433699, Maximum allocated: 6782
Allocations per second: 3366, Frees per second: 6412
Total memory used (in bytes): 133460320,
Total memory free (in bytes): 133918352
```

Sample Output

show services accounting memory (Service PIC interface)

```
user@host> show services accounting memory
Service Accounting interface: sp-0/1/0
Memory utilization
  Allocation count: 1000, Free count: 0
  Allocations per second: 0, Frees per second: 0
  Total memory used (in bytes): 218158272
  Total memory free (in bytes): 587147696

Service Accounting interface: sp-1/0/0
Memory utilization
  Allocation count: 1000, Free count: 0
  Allocations per second: 0, Frees per second: 0
  Total memory used (in bytes): 218157592
  Total memory free (in bytes): 587148376
```

show services accounting packet-size-distribution

Syntax	show services accounting packet-size-distribution <name (* all <i>service-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display a packet size distribution histogram.
Options	<p>none—Display a packet size distribution histogram of all accounting services.</p> <p>name (* all <i>service-name</i>)—(Optional) Display a packet size distribution histogram. Use a wildcard character, specify all services, or provide a specific services name.</p>
Required Privilege Level	view
List of Sample Output	show services accounting packet-size-distribution name on page 71
Output Fields	Table 9 on page 71 lists the output fields for the show services accounting packet-size-distribution command. Output fields are listed in the approximate order in which they appear.

Table 9: show services accounting packet-size-distribution Output Fields

Field Name	Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the [edit-forwarding-options accounting] hierarchy level. The default display, (default sampling), indicates the service was configured at the [edit-forwarding-options sampling-level] hierarchy level.
Local interface index	Index counter of the local interface.
Range start	Smallest packet length (in bytes) to count.
Range end	Largest packet length (in bytes) to count.
Number of packets	Count of packets detected in the size between Range start and Range end.
Percentage packets	Percentage of the total number of packets that are in this size range.

Sample Output

show services accounting packet-size-distribution name

```
user@host> show services accounting packet-size-distribution name test3
Service Accounting interface: mo-0/2/0, Local interface index: 163
Service name: test3
```

Range start	Range end	Number of packets	Percentage packets
32	64	2924	100

show services accounting status

Syntax	show services accounting status <inline-jflow fpc-slot <i>slot-number</i> name (* all <i>service-name</i>)>
Release Information	Command introduced before Junos OS Release 7.4. Command introduced in Junos OS Release 13.2R2 for EX Series switches.
Description	Display available Physical Interface Cards (PICs) for accounting services.
Options	<p>none—Display available PICs for all accounting services.</p> <p>inline-jflow fpc-slot <i>slot-number</i>—(Optional) Display inline flow accounting status for the specified FPC. For a two-member MX Series Virtual Chassis or EX9200 Virtual Chassis, the master router or switch uses FPC slot numbers 0 through 11 with no offset; the backup router or switch uses FPC slot numbers 12 through 23, with an offset of 12.</p> <p>name (* all <i>service-name</i>)—(Optional) Display available PICs. Use a wildcard character, specify all services, or provide a specific services name.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> show services accounting flow on page 59 Inline Flow Monitoring for Virtual Chassis Overview
List of Sample Output	show services accounting status name (Monitoring PIC interface) on page 74 show services accounting status name (Service PIC interface) on page 74 show services accounting status inline-jflow fpc-slot (when both IPv4 and IPv6 are configured) on page 75 show services accounting status inline-jflow (MX80 Router when both IPv4 and IPv6 are configured) on page 75
Output Fields	Table 10 on page 73 lists the output fields for the show services accounting status command. Output fields are listed in the approximate order in which they appear.

Table 10: show services accounting status Output Fields

Field	Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the <code>[edit-forwarding-options accounting]</code> hierarchy level. The default display, <code>(default sampling)</code> , indicates the service was configured at the <code>[edit-forwarding-options sampling-level]</code> hierarchy level.
FPC Slot	Slot number of the FPC for which the flow information is displayed.

Table 10: show services accounting status Output Fields (*continued*)

Field	Field Description
Local interface index	Index counter of the local interface.
Interface state	Accounting state of the passive monitoring interface. <ul style="list-style-type: none"> • Accounting—PIC is actively accounting. • Disabled—PIC has been disabled from the CLI. • Not accounting—PIC is up but not accounting. This can happen while the PIC is coming online, or when the PIC is up but has no logical unit configured under the physical interface. • Unknown
Group index	Integer that represents the monitoring group of which the PIC is a member. Group index is a mapping from the group name to an index. It is not related to the number of monitoring groups.
Export interval (in seconds)	Configured export interval for cflowd records, in seconds.
Export format	Configured export format.
Protocol	Protocol the PIC is configured to monitor.
Engine type	Configured engine type that is inserted in output cflowd packets.
Engine ID	Configured engine ID that is inserted in output cflowd packets.
Route Record Count	Number of routes recorded.
AS Record Count	Number of autonomous systems recorded.
Route Records Set	Status of route recording; whether routes are recorded or not.
Configuration Set	Status of monitoring configuration; whether monitoring configuration is set or not.

Sample Output

show services accounting status name (Monitoring PIC interface)

```

user@host> show services accounting status name count1
Service Accounting interface: mo-2/0/0, Local interface index: 468
Service name: count1
Interface state: Accounting
Group index: 0
Export interval (in seconds): 60, Export format: cflowd v8
Protocol: IPv4, Engine type: 55, Engine ID: 5

```

Sample Output

show services accounting status name (Service PIC interface)

```

user@host> show services accounting status name

```



```

Service Accounting interface: sp-0/1/0
Interface state: Accounting
  Export format: 9, Route record count: 0
  IFL to SNMP index count: 7, AS count: 0
  Configuration set: Yes, Route record set: No, IFL SNMP map set: Yes

Service Accounting interface: sp-1/0/0
Interface state: Accounting
  Export format: 9, Route record count: 33
  IFL to SNMP index count: 7, AS count: 1
  Configuration set: Yes, Route record set: Yes, IFL SNMP map set: Yes

```

show services accounting status inline-jflow fpc-slot (when both IPv4 and IPv6 are configured)

```

user@host> show services accounting status inline-jflow fpc-slot 5
FPC Slot: 5
  IPv4 export format: Version-IPFIX, IPv6 export format: Version-IPFIX
  VPLS export format: Not set
  IPv4 Route Record Count: 5, IPv6 Route Record Count: 7
  Route Record Count: 12, AS Record Count: 1
  Route-Records Set: Yes, Config Set: Yes

```

show services accounting status inline-jflow (MX80 Router when both IPv4 and IPv6 are configured)

```

user@host> show services accounting status inline-jflow

Status information
TFEB Slot: 0
Export format: IP-FIX
IPv4 Route Record Count: 6, IPv6 Route Record Count: 8
Route Record Count: 14, AS Record Count: 1
Route-Records Set: Yes, Config Set: Yes

```

show services accounting usage

Syntax	<code>show services accounting usage</code> <code><name service-name></code>
Release Information	Command introduced before Junos OS Release 7.4.
Description	Display the CPU usage of PIC used for active flow monitoring.
Options	<p>none—Display CPU usage for all service names.</p> <p>name service-name—(Optional) Display CPU usage for the specified service name.</p>
Additional Information	When no route record has been downloaded from the PIC, this command reports no flows, even though packets are being sampled.
Required Privilege Level	view
List of Sample Output	show services accounting usage (Monitoring PIC interface) on page 77 show services accounting usage (Service PIC interface) on page 77
Output Fields	Table 11 on page 76 lists the output fields for the show services accounting usage command. Output fields are listed in the approximate order in which they appear.

Table 11: show services accounting usage Output Fields

Output Field	Output Field Description
Service Accounting interface	Name of the service accounting interface.
Service name	Name of a service that was configured at the <code>[edit-forwarding-options accounting]</code> hierarchy level. The default display, (default sampling) , indicates the service was configured at the <code>[edit-forwarding-options sampling-level]</code> hierarchy level.
Local interface index	Index counter of the local interface.
Uptime	Time that the PIC has been operational (in milliseconds).
Interrupt time	Total time that the PIC has spent processing packets since the last PIC reset (in microseconds).
Load (5 second)	CPU load on the PIC, averaged more than 5 seconds. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.
Load (1 minute)	CPU load on the PIC, averaged more than 1 minute. The number is a percentage obtained by dividing the time spent on active tasks by the total elapsed time.

Sample Output

show services accounting usage (Monitoring PIC interface)

```
user@host> show services accounting usage
Service Accounting interface: mo-1/1/0, Local interface index: 15
Service name: (default sampling)
CPU utilization
  Uptime: 600413856 milliseconds, Interrupt time: 2403 microseconds
  Load (5 second): 43%, Load (1 minute): 24%
```

Sample Output

show services accounting usage (Service PIC interface)

```
user@host> show services accounting usage
Service Accounting interface: sp-0/1/0
Service name: (default sampling)
CPU utilization
  Uptime: 7853940 milliseconds, Interrupt time: 0 microseconds
  Load (5 second): 2%, Load (1 minute): 0%

Service Accounting interface: sp-0/1/0
Service name: (default sampling)
CPU utilization
  Uptime: 331160 milliseconds, Interrupt time: 0 microseconds
  Load (5 second): 2%, Load (1 minute): 0%
```

