

# Juniper Extension Toolkit Applications Guide

Published  
2020-01-07

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# About the Documentation

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This guide contains the Junos CLI topics for the Juniper Extension Toolkit (JET).

## 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 <https://www.juniper.net/documentation/>.

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

Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at <https://www.juniper.net/books>.

## 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.xsl;
    }
  }
}
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 [CLI Explorer](#).

## Documentation Conventions

[Table 1 on page viii](#) 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 viii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
<b>Bold text like this</b>	Represents text that you type.	To enter configuration mode, type the <b>configure</b> command:  user@host> <b>configure</b>
Fixed-width text like this	Represents output that appears on the terminal screen.	user@host> <b>show chassis alarms</b>  No alarms currently active
<i>Italic text like this</i>	<ul style="list-style-type: none"> <li>Introduces or emphasizes important new terms.</li> <li>Identifies guide names.</li> <li>Identifies RFC and Internet draft titles.</li> </ul>	<ul style="list-style-type: none"> <li>A policy <i>term</i> is a named structure that defines match conditions and actions.</li> <li><i>Junos OS CLI User Guide</i></li> <li>RFC 1997, <i>BGP Communities Attribute</i></li> </ul>



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

Convention	Description	Examples
<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@# <b>set system domain-name</b> <i>domain-name</i>
<b>Text like this</b>	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> <li>To configure a stub area, include the <b>stub</b> statement at the [edit <b>protocols ospf area area-id</b>] hierarchy level.</li> <li>The console port is labeled <b>CONSOLE</b>.</li> </ul>
< > (angle brackets)	Encloses optional keywords or variables.	<b>stub</b> <default-metric <i>metric</i> >;
(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.	<b>broadcast   multicast</b>  ( <i>string1</i>   <i>string2</i>   <i>string3</i> )
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	<b>rsvp { # Required for dynamic MPLS only</b>
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	<b>community name members [ <i>community-ids</i> ]</b>
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

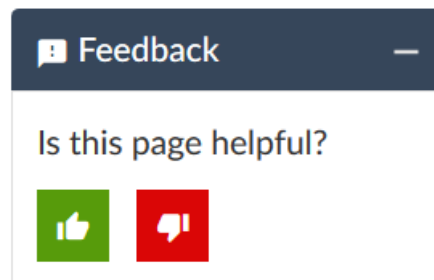
Table 2: Text and Syntax Conventions (*continued*)

Convention	Description	Examples
<b>Bold text like this</b>	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> <li>In the Logical Interfaces box, select <b>All Interfaces</b>.</li> <li>To cancel the configuration, click <b>Cancel</b>.</li> </ul>
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select <b>Protocols&gt;Ospf</b> .

## Documentation Feedback

We encourage you to provide feedback so that we can improve our documentation. You can use either of the following methods:

- Online feedback system—Click TechLibrary Feedback, on the lower right of any page on the [Juniper Networks TechLibrary](#) site, and do one of the following:



- Click the thumbs-up icon if the information on the page was helpful to you.
- Click the thumbs-down icon if the information on the page was not helpful to you or if you have suggestions for improvement, and use the pop-up form to provide feedback.
- E-mail—Send your comments to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net). Include the document or topic name, URL or page number, and software version (if applicable).

## Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active Juniper Care or Partner Support Services support contract, or are

covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

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

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- Find solutions and answer questions using our Knowledge Base: <https://kb.juniper.net/>
- Download the latest versions of software and review release notes: <https://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://kb.juniper.net/InfoCenter/>
- Join and participate in the Juniper Networks Community Forum: <https://www.juniper.net/company/communities/>
- Create a service request online: <https://myjuniper.juniper.net>

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

## Creating a Service Request with JTAC

You can create a service request with JTAC on the Web or by telephone.

- Visit <https://myjuniper.juniper.net>.
- 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 <https://support.juniper.net/support/requesting-support/>.

# 1

CHAPTER

## Configuration Statements

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---

# allow-clients

## Syntax

```
allow-clients {  
    address ip-address;  
}
```

## Hierarchy Level

```
[edit system services extension-service notification]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Specify client IP addresses from which notifications are allowed.

## Options

**address *ip-address***—Specify IPv4 or IPv6 addresses (prefix length optional) or host names. You can specify a set of values using square brackets ([ ]).

## Required Privilege Level

system—To view this statement in the configuration.

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

## RELATED DOCUMENTATION

| [notification](#) | 31

# application (Extensions)

## Syntax

```

application {
  file script-name {
    arguments arguments;
    checksum hash-algorithm hash-value;
    daemonize;
    refresh;
    refresh-from;
    respawn-on-normal-exit;
    routing-instance;
    source;
    traceoptions {
      file <filename> <files number> <match regex> <size size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
    username username;
  }
  max-datasize max-datasize;
  traceoptions {
    file <filename> <files number> <size size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}

```

## Hierarchy Level

```
[edit system extensions extension-service]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Configure the Junos OS extension service application.

**NOTE:** Global traceoptions for daemonized applications do not take effect if the daemonized application and global traceoptions are committed separately.

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

**Required Privilege Level**

maintenance—To view this statement in the configuration.

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

**RELATED DOCUMENTATION**

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# extensions

## Syntax

```

extensions {
  extension-service {
    application {
      file script-name {
        arguments arguments;
        checksum hash-algorithm hash-value;
        daemonize;
        refresh;
        refresh-from;
        routing-instance;
        source;
        traceoptions {
          file <filename> <files number> <match regex> <size size> <world-readable | no-world-readable>;
          flag flag;
          no-remote-trace;
        }
        username username;
      }
      max-datasize max-datasize;
      traceoptions {
        file <filename> <files number> <size size> <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
      }
    }
  }
}

providers {
  provider-id {
    license-type license deployment-scope [ deployments ];
  }
}

resource-limits {
  package package-name {
    resources {
      cpu {
        priority number;
        time seconds;
      }
      file {
        core-size bytes;
      }
    }
  }
}

```

```

        open number;
        size bytes;
    }
    memory {
        data-size bytes;
        locked-in bytes;
        resident-set-size bytes;
        socket-buffers bytes;
        stack-size bytes;
    }
}
}
process process-ui-name {
    resources {
        cpu {
            priority number;
            time seconds;
        }
        file {
            core-size bytes;
            open number;
            size bytes;
        }
        memory {
            data-size bytes;
            locked-in bytes;
            resident-set-size bytes;
            socket-buffers bytes;
            stack-size bytes;
        }
    }
}
}
}
}

```

## Hierarchy Level

```
[edit system]
```

## Release Information

Statement introduced in Junos OS Release 9.0.

**extension-service** option introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Configure extensions to Junos OS.

You must configure the **providers** *provider-id* statement to enable application packages developed using the Junos SDK to be deployed and run on the router.

You must configure the **extension-service** statement to enable application packages developed using the Juniper Extension Toolkit (JET) to be deployed and run on the device.

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

**NOTE:** You do not need this configuration in Junos OS Evolved. Run JET applications directly using a Python interpreter instead of configuring and invoking them in the CLI.

## Required Privilege Level

admin—To view this statement in the configuration.

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

# extension-service (System Extensions)

## Syntax

```
extension-service {
  application {
    file script-name {
      arguments arguments;
      checksum (md5 | sha-256 | sha1) hash;
      daemonize;
      refresh;
      refresh-from;
      respawn-on-normal-exit;
      routing-instance
      source;
      traceoptions {
        file <filename> <files number> <size size> <world-readable | no-world-readable>;
        flag flag;
        no-remote-trace;
      }
      username username;
    }
    max-datasize max-datasize;
    traceoptions {
      file <filename> <files number> <size size> <world-readable | no-world-readable>;
      flag flag;
      no-remote-trace;
    }
  }
}
```

## Hierarchy Level

[edit system extensions]

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

Statement introduced in Junos OS Release 17.1R1 for all MX-Series routers.

Statement introduced in Junos OS Release 17.1R1 for ACX500, ACX1000, ACX1100, ACX2100, ACX2200, ACX4000 routers.

Statement introduced in Junos OS Release 17.2R1 for PTX-Series routers.

Statement introduced in Junos OS Release 17.3R1 for SRX-Series Services Gateways.

Argument **respawn-on-normal-exit** introduced in Junos OS Releases 17.3R3 and 18.1R1.

### Description

Enable Junos OS extension services.

The **refresh** option instructs the system to refresh all jet applications from their source.

The **refresh-from** option instructs the system to refresh all jet applications from a given base URL.

The **source** option provides the specific URL of the source for this application.

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

### Required Privilege Level

maintenance—To view this statement in the configuration.

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

### RELATED DOCUMENTATION

| [extensions](#) | 18

# extension-service (System Services gRPC)

## Syntax

```
extension-service {
  request-response {
    grpc {
      max-connections max-connections;
      routing-instance routing-instance;
      ssl {
        address ip-address;
        local-certificate local-certificate;
        mutual-authentication {
          certificate-authority certificate-authority-profile-name;
          client-certificate-request (no-certificate | request-certificate | request-certificate-and-verify |
            require-certificate | require-certificate-and-verify);
        }
        port port;
      }
    }
  }
  notification {
    allow-clients {
      address ip-address;
    }
    broker-socket-send-buffer-size broker-socket-send-buffer-size;
    max-connections max-connections;
    port port;
  }
  traceoptions {
    file <filename> <files number> <match regex> <size size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
  }
}
```

## Hierarchy Level

[edit system services]

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

**grpc** level introduced in Junos OS Release 16.2 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

### Description

Enable Junos OS extension services.

**NOTE:** The **extension-service** statement at the **[edit system extensions]** hierarchy level is deprecated for Junos OS Evolved as of Release 19.1R1.

### Required Privilege Level

system—To view this statement in the configuration.

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

# file (JET)

## Syntax

```
file filename {
  arguments arguments;
  checksum hash-algorithm hash-value;
  daemonize;
  refresh;
  refresh-from;
  routing-instance;
  source;
  traceoptions {
    file <filename> <files number> <match regex> <size size> <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
  }
  username username;
}
```

## Hierarchy Level

[edit system extensions extension-service [application](#)]

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

**refresh**, **refresh-from**, **routing-instance**, and **source** options added in Junos OS Release 18.1R1 for MX Series, PTX Series, and QFX Series.

## Description

For files in the [edit system extensions extension-service [application](#)] hierarchy level, specify the configuration for each file in the extension-service application.

## Options

**arguments** *arguments*—Specify the command-line arguments called by a JET application. A program can take any number of command-line arguments. Enter the arguments in the way the application expects. Developer must supply this information.

**daemonize**—Specify the file as daemonized.



An application runs as a daemonized process in the background. An application configured to run as a daemonized process is automatically triggered upon commit. A non-daemonized application must be triggered manually from the command-line client.

**filename**—Local filename of the script file.

**refresh**—Refresh all operation scripts from their source

**refresh-from**—Refresh all operation scripts from a given base URL

**source**—URL source used for refresh for this script

**username *username***—Specify the name of the user under whose privileges the extension service will execute. This username is configured at the **[edit system login]** hierarchy level. If you do not associate a username with an extension-service application, the application is executed as user nobody.

**Default:** nobody

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

#### **Required Privilege Level**

**maintenance**—To view this statement in the configuration.

**maintenance-control**—To add this statement to the configuration.

# grpc

## Syntax

```
grpc {
  max-connections max-connections;
  routing-instance routing-instance;
  ssl {
    address ip-address;
    local-certificate local-certificate;
    mutual-authentication {
      certificate-authority certificate-authority-profile-name;
      client-certificate-request (no-certificate | request-certificate | request-certificate-and-verify | require-certificate
        | require-certificate-and-verify);
    }
    port port;
  }
}
```

## Hierarchy Level

[edit system services extension-service request-response]

## Release Information

Statement introduced in Junos OS Release 16.2 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

Statement introduced in Junos OS Release 17.2 for EX9200.

## Description

Configure the type of connections the gRPC service accepts for API applications.

## Options

**routing-instance** *routing-instance*—Name of routing instance for grpc.

## Required Privilege Level

system—To view this statement in the configuration.

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

## RELATED DOCUMENTATION

| [request-response](#) | 39

# interface-notification (programmable-rpd)

## Syntax

```
interface-notification name;
```

## Hierarchy Level

```
[edit logical-systems name routing-instances name routing-options programmable-rpd client id],
[edit logical-systems name routing-options programmable-rpd client id],
[edit routing-instances name routing-options programmable-rpd client id],
[edit routing-options programmable-rpd client id]
```

## Release Information

Statement introduced in Junos OS Release 17.4R1

## Description

Restrict interface event notifications from the programmable routing protocol process (prpd) to specified JET clients and interfaces. The prpd provides public APIs to program routing systems, making it possible for users to directly access the APIs to customize, create and modify behavior of their network.

## Default

No restrictions are imposed by default and JET clients are notified of all interfaces.

## Options

**name**—Interface name

## Required Privilege Level

routing

## RELATED DOCUMENTATION

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# license-type

## Syntax

```
license-type license deployment-scope [ deployments ];
```

## Hierarchy Level

```
[edit system extensions providers provider-id]
```

## Release Information

Statement introduced in Junos OS Release 10.2.

Statement introduced in Junos OS Release 11.1 for the QFX Series.

## Description

Configure the license type and the scope of application deployment.

## Options

***license***—Type of license. Obtain correct value from the application's provider.

***deployment***—Scope of application deployment. You can configure a set of deployments. Obtain correct value from the application's provider.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## RELATED DOCUMENTATION

[extensions](#) | 18

# max-connections

## Syntax

```
max-connections max-connections;
```

## Hierarchy Level

```
[edit system services extension-service request-response grpc]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Number of simultaneous connections for request-response that can be attached to jsd. The higher the number, the higher the impact on clients performance.

## Options

**max-connections** *max-connections*—Specify the maximum number of connections.

**Range:** 1 through 8

**Default:** 8

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

## Required Privilege Level

system—To view this statement in the configuration.

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

# notification (System Services)

## Syntax

```
notification {
  allow-clients {
    address ip-address;
  }
  broker-socket-send-buffer-size broker-socket-send-buffer-size;
  max-connections max-connections;
  port port;
}
```

## Hierarchy Level

```
[edit system services extension-service]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Enable notification services for applications running on devices running Junos OS.

**NOTE:** Notification service for JET applications is not supported in Junos OS Evolved.

## Options

**broker-socket-send-buffer-size** *broker-socket-send-buffer-size*—Socket send buffer size for the broker to publish the messages

**max-connections** *max-connections*—Specify the maximum number of connections.

**Range:** 1 through 20

**Default:** 20

**port** *port*—Specify the number of the port to accept incoming connections.

**Range:** 1 through 65535

**Default:** 1883

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

**Required Privilege Level**

system—To view this statement in the configuration.

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

**RELATED DOCUMENTATION**

| [grpc](#) | [27](#)

## providers

**Syntax**

```
providers {
  provider-id {
    license-type license deployment-scope [ deployments ];
  }
}
```

**Hierarchy Level**

[edit system [extensions](#)]

**Release Information**

Statement introduced in Junos OS Release 9.0.

**Description**

Activate the certificate of the provider of the application and enable the PIC for loading of the application.

**Options**

**provider-id**—Provider ID for the application package. The provider ID identifies the provider of the application to the system. The provider ID must be activated on the router to allow the application to be deployed on the router and run.

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

**Required Privilege Level**

admin—To view this statement in the configuration.

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

# purge-timeout (routing-options programmable-rpd)

## Syntax

```
purge-timeout {  
    never;  
    timeout <seconds>  
}
```

## Hierarchy Level

```
[edit routing-options programmable-rpd]
```

## Release Information

Statement introduced in Junos OS Release 16.2.

Support of purge-timeout value **never** introduced in Junos OS Release 18.4.

## Description

Set the time, in seconds, after which a disconnected client times-out. Upon disconnect, the client state remains available but no operations occur. If the disconnected client reconnects before the set time has elapsed, the states are restored on the router. If it does not, all client operations are reverted and the programmable routing protocol process (prpd) server notifies any other modules of the disconnect so they can purge any other client operations.

When the purge-timeout is set to **never**, the prpd-client-added routes are not deleted when the client disconnects and does not reconnect back. The routes are deleted only when the client explicitly deletes the routes. If routing is restarted, then the client-added routes are lost.

The prpd provides public APIs to program routing systems, making it possible for users to directly access the APIs to customize, create and modify behavior of their network.

## Options

### Values:

**never**—When this option is configured purge timeout is infinite (that is, client added routes never time out) for the BGP route service.

**timeout seconds** —(Optional) Set the time, in seconds, after which disconnected clients time-out on the prpd server and the routes added by the client is purged.

**Range:** 1 through 604,800



**NOTE:** Starting in Junos OS Releases 18.4R1, the maximum purge-timeout value is 604,800 seconds (7 days). Prior to this release, the maximum value was 1000 seconds.

**Default:** 120

**Required Privilege Level**

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

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

**RELATED DOCUMENTATION**

[traceoptions](#) | 46

[show programmable-rpd clients](#) | 55

[show route](#)

# refresh (JET)

## Syntax

```
refresh;
```

## Hierarchy Level

```
[edit system extensions extension-service application file filename]
```

## Release Information

Statement introduced in Junos OS Release 18.1R1.

## Description

Overwrite the local copy of all enabled commit scripts or a single enabled commit script with the copy located at the source URL, as specified in the **source** statement at the same hierarchy level. If the **load-scripts-from-flash** statement is configured, the device refreshes the scripts on the flash drive instead of the hard disk.

The update operation occurs as soon as you issue the **set refresh** configuration mode command. Issuing the **set refresh** command does not add the **refresh** statement to the configuration. Thus the command behaves like an operational mode command by executing an operation, instead of adding a statement to the configuration.

**NOTE:** On the QFabric system, commit scripts are stored in the `/pbdata/mgd_shared/partition-ip/var/db/scripts/commit/` directory on the Director device.

As of Junos OS Release 18.1R1, you can specify which routing instance the update is done through. To specify the routing instance to use for updating commit scripts, configure the routing instance in two places in the CLI:

```
user@host# set system routing-instances routing-instance-name description description
user@host# set system extensions extension-service application file filename routing-instance
routing-instance-name
```

If you enable the non-default management instance and use **mgmt\_junos** for **routing-instance-name**, you can configure scripts to update using the dedicated management instance **mgmt\_junos**.

## Required Privilege Level

maintenance—To view this statement in the configuration.

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

## RELATED DOCUMENTATION

---

*Configuring and Using a Master Source Location for a Script*

---

*Example: Configuring and Refreshing from the Master Source for a Script*

---

[refresh-from \(JET\) | 37](#)

---

[source \(JET Scripts\) | 41](#)

---

[routing-instance \(JET Scripts\) | 40](#)

# refresh-from (JET)

## Syntax

```
refresh-from url;
```

## Hierarchy Level

```
[edit system extensions extension-service application file filename]
```

## Release Information

Statement introduced in Junos OS Release 18.1R1.

## Description

Overwrite the local copy of all enabled commit scripts or a single enabled commit script with the copy located at the specified URL. If the **load-scripts-from-flash** statement is configured, the device refreshes the scripts on the flash drive instead of the hard disk.

The update operation occurs as soon as you issue the **set refresh-from url** configuration mode command. Issuing the **set refresh-from** command does not add the **refresh-from** statement to the configuration. Thus the command behaves like an operational mode command by executing an operation, instead of adding a statement to the configuration.

**NOTE:** This statement is not supported on the QFabric system.

As of Junos OS Release 18.1R1, you can specify which routing instance the update is done through. To specify the routing instance to use for updating op scripts, configure the routing instance in two places in the CLI:

```
user@host# set system routing-instances routing-instance-name description description
user@host# set system extensions extension-service application file filename routing-instance
routing-instance-name
```

If you enable the non-default management instance and use **mgmt\_junos** for **routing-instance-name**, you can configure scripts to update using the dedicated management instance **mgmt\_junos**.

## Options

**url**—The source specified as a Hypertext Transfer Protocol (HTTP) URL, FTP URL, or secure copy (scp)-style remote file specification.

**Required Privilege Level**

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

RELATED DOCUMENTATION

<i>Using an Alternate Source Location for a Script</i>
<a href="#">refresh (JET)   35</a>
<a href="#">source (JET Scripts)   41</a>
<a href="#">routing-instance (JET Scripts)   40</a>

# request-response

## Syntax

```
request-response {
  grpc {
    max-connections max-connections;
    routing-instance routing-instance;
    ssl {
      address ip-address;
      local-certificate local-certificate;
      mutual-authentication {
        certificate-authority certificate-authority-profile-name;
        client-certificate-request (no-certificate | request-certificate | request-certificate-and-verify |
          require-certificate | require-certificate-and-verify);
      }
      port port;
    }
  }
}
```

## Hierarchy Level

```
[edit system services extension-service]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

grpc option introduced in Junos OS Release 16.2 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Allow request-response API execution.

Statements are explained separately.

## Required Privilege Level

system—To view this statement in the configuration.

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

## RELATED DOCUMENTATION

## routing-instance (JET Scripts)

### Syntax

```
routing-instance routing-instance-name;
```

### Hierarchy Level

```
[edit system extensions extension-service application file filename]
```

### Release Information

Statement introduced in Junos OS Release 18.1R1.

### Description

Configure the routing instance you want to use to update Automation scripts. To use a management instance, configure the **management-instance** statement along with the **routing-instance** statement, thus enabling JET scripts to use the non-default management routing instance `mgmt_junos` when refreshing the scripts.

### Options

***routing-instance-name***—Name of the routing instance. For the management instance, use **`mgmt_junos`**. Otherwise, you can specify any routing instance name.

**NOTE:** You must also define the routing instance under the **[edit routing-instances]** hierarchy level.

### Required Privilege Level

system—To view this statement in the configuration.

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

### RELATED DOCUMENTATION

*management-instance*

*Management Interface in a Nondefault Instance*

# source (JET Scripts)

## Syntax

```
source url;
```

## Hierarchy Level

```
[edit system extensions extension-service application file filename]
```

## Release Information

Statement introduced in Junos OS Release 18.1R1.

## Description

Specify the location of the master source file for a JET script. When you issue the **set refresh** configuration mode command at the same hierarchy level, the local copy of the script is overwritten by the version stored at the specified URL. If the **load-scripts-from-flash** statement is configured, the device refreshes the scripts on the flash drive instead of the hard disk.

**NOTE:** JET scripts are stored in the `/var/db/scripts/jet` directory.

## Options

**url**—Master source file for a JET script specified as an HTTP URL, FTP URL, or scp-style remote file specification.

## Required Privilege Level

**maintenance**—To view this statement in the configuration.

**maintenance-control**—To add this statement to the configuration.

## RELATED DOCUMENTATION

*Configuring and Using a Master Source Location for a Script*

*Example: Configuring and Refreshing from the Master Source for a Script*



# traceoptions (Extensions)

## Syntax

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

## Hierarchy Level

```
[edit system extensions extension-service application],
[edit system extensions extension-service application file script-name]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

Statement introduced in Junos OS Release 19.1R1 for the **[edit system extensions extension-service application file script-name]** hierarchy level.

## Description

Trace options for extension-service applications. You can set the **traceoptions** statement for the **application** level or for the **file script-name** level or for both. If the **traceoptions** statement is set for both the **application** and **file script-name** levels, the latter will have a higher priority.

**NOTE:** Global traceoptions for daemonized applications do not take effect if the daemonized application and global traceoptions are committed separately

## Options

**file**—Indicate trace file information.

**filename**—Name of the file to receive the tracing operation output. Enclose the name in quotation marks. Traceoption output files are located in the **/var/log/** directory.

**files number**—(Optional) Specify maximum number of trace files.

**Range:** 2 through 1000

**Default:** 3

**size size**—(Optional) Specify the maximum size of each trace file. When a trace file named **trace-file** reaches its maximum size, it is renamed **trace-file.0**. The traceoption output continues in a second trace file named **trace-file.1**. When **trace-file.1** reaches its maximum size, output continues in a third file named **trace-file.2**, and so on. When the maximum number of trace files is reached, the oldest trace file is overwritten.

**Range:** 10240 through 1073741824

**Default:** 128k

**world-readable | no-world-readable**—(Optional). Grant all users permission to read log files, or restrict the permission only to the root user and users who have Junos OS maintenance permission.

**flag flag**—Specify the tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements:

**all**—Trace all operations.

**config**—Trace important events.

**general**—Trace script input data.

**grpc**—Trace grpc server events.

**notification**—Trace notification events.

**routing-socket**—Trace routing socket calls.

**timeouts**—Trace timeouts.

**timer**—Trace internal timer events.

**no-remote-trace**—Disable remote tracing. This option is valid only when [system tracing] is configured.

#### Required Privilege Level

**trace**—To view this statement in the configuration.

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

#### RELATED DOCUMENTATION

| [application](#) | 16

# traceoptions (Services)

## Syntax

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

## Hierarchy Level

```
[edit system services extension-service]
```

## Release Information

Statement introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Define tracing operations for the JET service process (jsd).

## Options

**file**—Indicate trace file information.

**filename**—Name of the file to receive the tracing operation output. Enclose the name in quotation marks. Traceoption output files are located in the **/var/log/** directory.

**files number**—(Optional) Specify the maximum number of trace files.

**Range:** 2 through 1000

**Default:** 10

**match regex**—Specify the regular expression for lines to be logged.

**size size**—(Optional) Specify the maximum size of each trace file. When a trace file named **trace-file** reaches its maximum size, it is renamed **trace-file.0**. The traceoption output continues in a second trace file named **trace-file.1**. When **trace-file.1** reaches its maximum size, output continues in a third file named **trace-file.2**, and so on. When the maximum number of trace files is reached, the oldest trace file is overwritten.

**Range:** 10,240 through 1,073,741,824 bytes

**Default:** 1000k

**world-readable | no-world-readable**—(Optional). Grant all users permission to read log files, or restrict the permission only to the root user and users who have Junos OS maintenance permission.

**flag flag**—Specify the tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements:

- **all**—Trace everything.
- **config**—Trace configuration events.
- **general**—Trace general events.
- **grpc**—Trace grpc server events.
- **notification**—Trace notification events.
- **routing-socket**—Trace routing socket calls
- **timeouts**—Trace timeouts.
- **timer**—Trace internal timer events.

**no-remote-trace**—Disable remote tracing.

#### **Required Privilege Level**

**trace**—To view this statement in the configuration.

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

# traceoptions (routing-options programmable-rpd)

## Syntax

```
traceoptions {
  file filename <files number> <size size> <world-readable | no-world-readable>;
  flag flag <disable>;
}
```

## Hierarchy Level

```
[edit routing-options programmable-rpd]
flag <flags>
file <filename> <size>
```

## Release Information

Statement introduced in Junos OS Release 16.2 for MX Series.

## Description

Starts logging traces related to the programmable routing protocol process (prpd). The prpd provides public APIs to program routing systems, making it possible for users to directly access the APIs to customize, create and modify behavior of their network.

Use the **traceoptions** command, along with related show commands, to help debug client-server interactions, identify the flow of control, and detect errors, get client-level information and statistics.

You can filter traces according to the flag(s) you have enabled.

## Default

If you do not include this statement, no tracing operations are performed.

## Options

### Values:

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

**files *number***—(Optional) Maximum number of trace files. When a trace file named ***trace-file*** reaches its maximum size, it is renamed ***trace-file.0***, then ***trace-file.1***, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. Note that if you specify a maximum number of files, you also must specify a maximum file size with the **size** option.

**Range:** 2 through 1000 files

**Default:** 10 files

**no-world-readable**—(Optional) Prevent any user from reading the log file.

**size size**—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named **trace-file** reaches this size, it is renamed **trace-file.0**. When the **trace-file** again reaches its maximum size, **trace-file.0** is renamed **trace-file.1** and **trace-file** is renamed **trace-file.0**. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten. Note that if you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

**Syntax:** **xk** to specify KB, **xm** to specify MB, or **xg** to specify GB

**Range:** 1024 to 4,294,967,295 bytes

**Default:** 128 KB

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

**flag flag**—Specifies the tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. The options are explained here:

- **all**—All tracing operations
- **client**—Client events
- **general**—All normal operations and routing table changes (a combination of the **normal** and **route** trace operations)
- **normal**—All normal operations
- **policy**—Routing policy operations and actions
- **route**—Routing table changes
- **state**—State transitions
- **task**—Interface transactions and processing
- **timer**—Timer usage

#### Required Privilege Level

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

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

#### RELATED DOCUMENTATION

[purge-timeout](#) | 33

[show programmable-rpd clients](#) | 55

[show route](#)

# 2

CHAPTER

## Operational Commands

---

`request extension-service (start | stop)` | **51**

`show extension-service status` | **52**

`show programmable-rpd clients` | **55**

---





# request extension-service (start | stop)

## Syntax

```
request extension-service (start | stop) application-name  
<invoke-debugger cli>
```

## Release Information

Command introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Start or stop a JET application running on a device running Junos OS.

**NOTE:** You do not need this command in Junos OS Evolved. Run JET applications directly using a Python interpreter instead of configuring and invoking them in the CLI.

## Options

***application-name***—Name of application to be started or stopped.

***invoke-debugger cli***—(Optional) Starts the extension service process in debugger mode.

## Required Privilege Level

maintenance

## Output Fields

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

## Sample Output

```
user@device> request extension-service start cmdline_args.py
```

```
Extension-service application 'cmdline_args.py' started with pid: 99418
```

# show extension-service status

## Syntax


```
show extension-service status (application-name | all)
```

## Release Information

Command introduced in Junos OS Release 16.1 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Display the status of all JET applications.

**NOTE:** The **show extension-service status** operational command is limited to use with Python applications only.

## Options

- application-name***—Display information for a single application.
- all**—Display information for all JET applications running on the system.

## Required Privilege Level

view

## List of Sample Output

- [show extension-service status on page 53](#)
- [show extension-service status all on page 53](#)
- [show extension-service status all \(when no applications are active\) on page 53](#)

## Output Fields

[Table 3 on page 52](#) lists the output fields for the **show extension-service status** command.

Table 3: show extension-service status Output Fields

Field Name	Field Description
Name	Name of the application.
Arguments	Arguments passed to the application.
Process-id	Process ID.

Table 3: show extension-service status Output Fields (*continued*)

Field Name	Field Description
<b>Stack-Segment-Size</b>	Size of the stack segment memory.
<b>Data-Segment-Size</b>	Size of the data segment memory.

## Sample Output

### show extension-service status

```
user@host> show extension-service status application-one
```

```
Extension service application details:
Name : application-one
Arguments: -arg1 foo -arg2 goo
Process-id: 52592
Stack-Segment-Size: 16777216B
Data-Segment-Size: 134217728B
```

### show extension-service status all

```
user@host> show extension-service status all
```

```
Extension service application details:
Name : application-name1
Arguments: -arg1 foo -arg2 goo
Process-id: 54834
Stack-Segment-Size: 16777216B
Data-Segment-Size: 134217728B
Name : application-name2
Arguments: -arg1 foo -arg2 goo
Process-id: 55011
Stack-Segment-Size: 16777216B
Data-Segment-Size: 134217728B
```

### show extension-service status all (when no applications are active)

```
user@host> show extension-service status all
```

```
warning: No active extension-services
```

# show programmable-rpd clients

## Syntax

```
show programmable-rpd clients
```

## Release Information

Command introduced in Junos OS Release 16.2 for MX80, MX104, MX240, MX480, MX960, MX2010, MX2020, vMX Series.

## Description

Lists clients connected to the programmable routing protocol process (prpd) server. The prpd provides public APIs to program routing systems, making it possible for users to directly access the APIs to customize, create and modify behavior of their network.

Output provided with the command includes client specific details and statistics such as client ID, protocol and corresponding gateway handle , purge timer, the client up/down status, and if the client is disconnected, the time remaining before the client state is purged (if the client has not registered any protocol, the gateway handle is 0).

## Required Privilege Level

view

## RELATED DOCUMENTATION

[purge-timeout](#) | 33

[show route](#)

## List of Sample Output

[show programmable-rpd clients on page 55](#)

## Output Fields

## Sample Output

```
show programmable-rpd clients
```

```
user@host> show programmable-rpd clients
```

RPD global purge timeout: 120

RPD Server connected client details:

ClientIdentifier	PurgeTimer	Status	Timeout	Protocol	Gateway
3	150	Up		BGP-Static	578
2	75	Up		NoGwProtocol	0
1	120	Down	117	BGP-Static	577