# Junos® OS

## OpenConfig Feature Guide

Release
17.1

Modified: 2017-02-08

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net



*Junos® OS OpenConfig Feature Guide*
17.1


The information in this document is current as of the date on the title page.

YEAR 2000 NOTICE

Juniper Networks hardware and software products are Year 2000 compliant. Junos OS has no known time-related limitations through the year 2038. However, the NTP application is known to have some difficulty in the year 2036.

## END USER LICENSE AGREEMENT

The Juniper Networks product that is the subject of this technical documentation consists of (or is intended for use with) Juniper Networks software. Use of such software is subject to the terms and conditions of the End User License Agreement ("EULA") posted at http://www.juniper.net/support/eula.html. By downloading, installing or using such software, you agree to the terms and conditions of that EULA.

# Table of Contents


About the Documentation . . . . . vii
Documentation and Release Notes . . . . . vii
Supported Platforms . . . . . vii
Using the Examples in This Manual . . . . . vii
Merging a Full Example . . . . . viii
Merging a Snippet . . . . . viii
Documentation Conventions . . . . . ix
Documentation Feedback . . . . . xi
Requesting Technical Support . . . . . xi
Self-Help Online Tools and Resources . . . . . xi
Opening a Case with JTAC . . . . . xii

Part 1 Overview

Chapter 1 OpenConfig Overview . . . . . 3

OpenConfig Overview . . . . . 3
OpenConfig Data Model Version . . . . . 4
Installing the OpenConfig Package . . . . . 4

Chapter 2 gRPC Overview . . . . . 7

Understanding OpenConfig and gRPC on Junos Telemetry Interface . . . . . 7
Network Agent Software . . . . . 7
Using OpenConfig for Junos OS to Enable Junos Telemetry Interface . . . . . 8
Using gRPC to Stream Data . . . . . 8
Installing the Network Agent Package (Junos Telemetry Interface) . . . . . 10
gRPC Service Definition for OpenConfig Telemetry . . . . . 12
Guidelines for gRPC Sensors . . . . . 14
Supported gRPC Sensors . . . . . 14
Example: gRPC Subscription for Telemetry Data . . . . . 17

Chapter 3 OpenConfig to Junos Mapping . . . . . 21

Mapping OpenConfig BGP Commands to Junos Configuration . . . . . 21
Mapping OpenConfig Interface Commands to Junos Configuration . . . . . 30
Mapping OpenConfig LLDP Commands to Junos Configuration . . . . . 34
Mapping OpenConfig Local Routing Commands to Junos Configuration . . . . . 35
Mapping OpenConfig MPLS Commands to Junos Configuration . . . . . 36
Mapping OpenConfig Routing Policy Commands to Junos Configuration . . . . . 47

Chapter 4 Configuration Statements . . . . . 51

netconf . . . . . 52

# List of Tables


About the Documentation . . . . . vii

Table 1: Notice Icons . . . . . ix
Table 2: Text and Syntax Conventions . . . . . ix

Part 1 Overview

Chapter 1 OpenConfig Overview . . . . . 3

Table 3: OpenConfig Data Model Versions . . . . . 4

Chapter 2 gRPC Overview . . . . . 7

Table 4: Telemetry RPCs . . . . . 8
Table 5: gRPC Sensors . . . . . 15

Chapter 3 OpenConfig to Junos Mapping . . . . . 21

Table 6: Global BGP Configuration . . . . . 21
Table 7: Global AFI-SAFI Configuration . . . . . 22
Table 8: Global Apply-Policy Configuration . . . . . 25
Table 9: Peer-Group Configuration . . . . . 25
Table 10: Neighbors Configuration . . . . . 27
Table 11: VRRP Configuration . . . . . 30
Table 12: IPv4 and IPv6 Address Configuration . . . . . 32
Table 13: Interface AE Configuration . . . . . 32
Table 14: LACP Configuration . . . . . 32
Table 15: Member Interface Configuration . . . . . 33
Table 16: Ethernet Configuration . . . . . 33
Table 17: IFD Configuration . . . . . 33
Table 18: IFL Configuration . . . . . 34
Table 19: Global LLDP Configuration . . . . . 34
Table 20: Interface Configuration . . . . . 35
Table 21: Static Route Configuration . . . . . 35
Table 22: Local Aggregate Configuration . . . . . 36
Table 23: Global MPLS Configuration . . . . . 36
Table 24: TE Global Attributes . . . . . 37
Table 25: TE Interface Attributes . . . . . 38
Table 26: RSVP Signaling Protocols . . . . . 39
Table 27: Label Switched Paths . . . . . 41
Table 28: RSVP P2P Tunnel . . . . . 44
Table 29: Defined Set Configuration . . . . . 47
Table 30: BGP Defined Set Configuration . . . . . 47
Table 31: Policy Definition Configuration . . . . . 48

# About the Documentation


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


## Documentation and Release Notes

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.

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 http://www.juniper.net/books.

## Supported Platforms

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

- MX Series
- PTX 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.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.xsl; }
   ```

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 ix defines notice icons used in this guide.

### Table 1: Notice Icons

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

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

### Table 2: Text and Syntax Conventions

| Convention | Description | Examples |
|---|---|---|
| **Bold text like this** | Represents text that you type. | To enter configuration mode, type the **configure** command:<br><br>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. | `user@host>` **show chassis alarms**<br>`No alarms currently active` |
| *Italic text like this* | • Introduces or emphasizes important new terms.<br>• Identifies guide names.<br>• Identifies RFC and Internet draft titles. | • A policy *term* is a named structure that defines match conditions and actions.<br>• *Junos OS CLI User Guide*<br>• RFC 1997, *BGP Communities Attribute* |
| *Italic text like this* | Represents variables (options for which you substitute a value) in commands or configuration statements. | Configure the machine's domain name:<br>[edit]<br>root@# **set system domain-name** *domain-name* |
| **Text like this** | Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components. | • To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level.<br>• 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**<br>**(*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 [** ***community-ids*** **]** |
| Indention and braces ( { } ) | Identifies a level in the configuration hierarchy. | [edit]<br>routing-options {<br>  static {<br>  route default {<br>  nexthop *address*;<br>  retain;<br>  }<br>  }<br>} |
| ; (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. | • In the Logical Interfaces box, select **All Interfaces**.<br>• 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**. |

## Documentation Feedback

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:

- Online feedback rating system—On any page of the Juniper Networks TechLibrary site at http://www.juniper.net/techpubs/index.html, simply click the stars to rate the content, and use the pop-up form to provide us with information about your experience. Alternately, you can use the online feedback form at http://www.juniper.net/techpubs/feedback/.
- E-mail—Send your comments to **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 J-Care or Partner Support Service 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 http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

### Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- 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


- OpenConfig Overview on page 3
- gRPC Overview on page 7
- OpenConfig to Junos Mapping on page 21


 

CHAPTER 1

# OpenConfig Overview


- OpenConfig Overview on page 3
- Installing the OpenConfig Package on page 4


## OpenConfig Overview

OpenConfig is a collaborative effort in the networking industry to move toward a more dynamic, programmable method for configuring and managing multivendor networks. OpenConfig supports the use of vendor-neutral data models to configure and manage the network. These data models define the configuration and operational state of network devices for common network protocols or services. The data models are written in YANG, a standards-based, data modeling language that is modular, easy to read, and supports remote procedure calls (RPCs). Using industry standard models greatly benefits an operator with devices in a network from multiple vendors. The goal of OpenConfig is for operators to be able to use a single set of data models to configure and manage all the network devices that support the OpenConfig initiative.

OpenConfig for Junos OS supports the YANG data models and uses RPC frameworks to facilitate communications between a client and the router. You have the flexibility to configure your router directly by using Junos OS, or by using a third-party schema, such as OpenConfig. OpenConfig modules define a data model through its data, and the hierarchical organization of and constraints on that data. Each module is uniquely identified by a namespace URL to avoid possible conflicts with the Junos OS name.

The configuration and operational statements in Junos OS have corresponding path statements in OpenConfig. The following is a list of data modules for which mapping of OpenConfig and Junos OS configuration and operational statements is supported:

- BGP
- Routing policy
- Telemetry
- Local routing
- Interfaces
- MPLS
- LLDP

For more information on the OpenConfig initiative, see http://www.openconfig.net/.

## OpenConfig Data Model Version

Table 3 on page 4 lists the OpenConfig data model versions.

**Table 3: OpenConfig Data Model Versions**

| OpenConfig Data Model | Junos OS Version | OpenConfig Supported Version |
|---|---|---|
| BGP | Release 16.1 R3 | 2.0.1 |
| | Release 17.1 R1 | 2.1.1 |
| Interfaces | Release 16.1 R3 and 17.1 R1 | 1.0.2 |
| LACP | Release 16.1 R3 and 17.1 R1 | 1.0.2 |
| Local routing | Release 16.1 R3 and 17.1 R1 | 1.0.0 |
| Telemetry | Release 16.1 R3 and 17.1 R1 | 0.2.0 |
| RPC | Release 16.1 R3 and 17.1 R1 | 0.1.0 |
| LLDP | Release 17.1 R1 | 0.1.0 |
| Platform | Release 16.1 R3 and 17.1 R1 | 0.4.0 |
| Routing policy | Release 16.1 R3 | 2.0.0 |
| | Release 17.1 R1 | 2.0.1 |
| MPLS RSVP | Release 16.1 R3 and 17.1 R1 | 1.0.1 |

**Related Documentation**

- *Understanding YANG on Devices Running Junos OS*
- *NETCONF XML Management Protocol Developer Guide*

## Installing the OpenConfig Package

OpenConfig for Junos OS corresponds to OpenConfig YANG data module releases and contain translation scripts and deviation modules for each supported Junos OS release. Each package includes the following files:

- OpenConfig set of data models written in YANG.
- Translation scripts that translate OpenConfig configuration schemas to Junos OS configuration schemas for each supported Junos OS release.
- Deviation modules that specify the unsupported nodes within the schema for each supported Junos OS release.

- Augmentation modules that specify additions to various OpenConfig specified models.
- Dynamic rendering files that map operational state data for each supported Junos OS release.

OpenConfig for Junos OS software package have the following naming convention:

junos-openconfig-*XX.YY.ZZ.JJ*-signed.tgz (Junos OS)
junos-openconfig-x86-32-*XX.YY.ZZ.JJ*.tgz (Junos OS with Upgraded FreeBSD)

where:

- *XX* represents the OpenConfig major release number.
- *YY* represents the OpenConfig minor release number.
- *ZZ* represents the OpenConfig patch release number.
- *JJ* represents the Juniper Networks release number.

NOTE: The **junos-openconfig-x86-32-*XX.YY.ZZ.JJ*.tgz** package supports both 32 and 64 bit systems.

To install the OpenConfig for Junos OS software package, use the **request system software add** command, for example:

user@router> **request system software add** junos-openconfig-*XX.YY.ZZ.JJ*-signed.tgz

or

user@router> **request system software add** junos-openconfig-x86-32-*XX.YY.ZZ.JJ*.tgz

**Related Documentation**

- *Understanding YANG on Devices Running Junos OS*
- *NETCONF XML Management Protocol Developer Guide*
- *Understanding Junos OS with Upgraded FreeBSD*

CHAPTER 2

# gRPC Overview


- Understanding OpenConfig and gRPC on Junos Telemetry Interface on page 7
- Installing the Network Agent Package (Junos Telemetry Interface) on page 10
- gRPC Service Definition for OpenConfig Telemetry on page 12
- Guidelines for gRPC Sensors on page 14
- Example: gRPC Subscription for Telemetry Data on page 17


## Understanding OpenConfig and gRPC on Junos Telemetry Interface

Starting in Junos OS Release 16.1R3, you can use a set of remote procedure call (RPC) interfaces to configure the Junos Telemetry Interface and stream telemetry data using the gRPC framework. OpenConfig supports the use of vendor-neutral data models for configuring and managing multivendor networks. gRPC is an open source framework that provides secure and reliable transport of data.

NOTE: **OpenConfig for Junos OS and gRPC is supported only on MPCs on MX Series and on PTX Series routers.**


- Network Agent Software on page 7
- Using OpenConfig for Junos OS to Enable Junos Telemetry Interface on page 8
- Using gRPC to Stream Data on page 8


### Network Agent Software

Implementing OpenConfig with gRPC for Junos Telemetry Interface requires that you download and install a package called Network Agent if your Juniper Networks device is running a version of Junos OS with Upgraded FreeBSD. For all other versions of Junos OS, the Network Agent functionality is embedded in the software. Network Agent functions as a gRPC server and terminates the OpenConfig RPC interfaces. It is also responsible for streaming the telemetry data according to the OpenConfig specification. To view the OpenConfig specification for telemetry, see the OpenConfig Telemetry specification. For more information about OpenConfig for Junos OS, see the *OpenConfig Feature Guide*.

The Network Agent component also supports server-based Secure Sockets Layer (SSL) authentication. Client-based SSL authentication is not supported. You must install SSL certificates on your Juniper Networks device.

For information about installing the Network Agent package, see "Installing the Network Agent Package" on page 10.

## Using OpenConfig for Junos OS to Enable Junos Telemetry Interface

OpenConfig for Junos OS specifies an RPC model to enable the Junos Telemetry Interface. You must download and install the OpenConfig for Junos OS package on your Juniper Networks device. For more information see "Installing the OpenConfig Package" on page 4. The programmatic interface **OpenConfigTelemetry** that is installed by the Network Agent package defines the telemetry gRPC service.

The **telemetrySubscribe** RPC specifies the following subscription parameters:

- OpenConfig path that identifies the system resource to stream telemetry data, for example:
  **/interfaces/interface/state/counters/**
- Interval at which data is reported and streamed to the collector server, in milliseconds, for example:
  **sample_frequency = 4000**

The **telemetrySubscribe** RPC is used by a streaming server, or collector, to request an inline subscription from for data at the specified path. The device should then send telemetry data back on the same connection as the subscription request.

For an example of how to use gRPC to subscribe to telemetry data, see "Example: gRPC Subscription for Telemetry Data" on page 17.

## Using gRPC to Stream Data

Per the OpenConfig specification, only gRPC-based transport is supported for streaming data. The gRPC server that is installed by the Network Agent package terminates the gRPC sessions from the management system that runs the client. RPC calls trigger the creation of Junos OS sensors that either stream data periodically or report events, which are then funneled onto the appropriate gRPC channel by Network Agent.

See Table 4 on page 8 for a list and descriptions of the RPCs implemented to the support the Junos Telemetry Interface.

### Table 4: Telemetry RPCs

| RPC Name | Description |
|---|---|
| **telemetrySubscribe** | Specify telemetry parameters and stream data for the specified list of OpenConfig paths. |
| **getTelemetrySubscriptions** | Retrieve the list of subscriptions that are created through **telemetrySubscribe**. |

Table 4: Telemetry RPCs *(continued)*

| RPC Name | Description |
|---|---|
| **cancelSubscription** | Unsubscribe a subscription created through **telemetrySubscribe**. |

To view the grRPC service definition, see the "gRPC Service Definition for OpenConfig Telemetry" on page 12.

Data streamed through gPRC is formatted in OpenConfig key/value pairs in Google protocol buffers (gpb) messages. In this universal format, keys are strings that correspond to the path of the system resources in the OpenConfig schema for the device being monitored. The values correspond to integers or strings that identify the operational state of the system resource, such a statistics counters and the state of a resource.

The following shows the universal key/value format:

```
message KeyValue {
    string key        = 1 [(telemetry_options).is_key = true];
    uint64 int_value  = 2;
    string str_value  = 3;
    string prefix_str = 4;
}

message TelemetryStream {
    // router name or export IP address
    required string system_id     = 1 [(telemetry_options).is_key = true];

    // line card / RE (slot number)
    optional uint32 component_id  = 2 [(telemetry_options).is_key = true];

   // PFE (if applicable)
    optional uint32 sub_component_id = 3 [(telemetry_options).is_key = true];

   // timestamp (common to all entries in the kv array)
    optional uint64 timestamp     = 4 [(telemetry_options).is_timestamp = true];


    // key / value pairs
    repeated KeyValue kv;
}
```

The following example shows how a set of counters for an interface can be represented:

```
key = "/interfaces/counters/rx-bytes",     int_value = 1000
key = "/interfaces/counters/tx-bytes",     int_value = 2000
key = "/interfaces/counters/rx-packets", int_value = 10
key = "/interfaces/counters/rx-bytes" ,    int_value = 20
key = "/interfaces/counters/oper-state", str_value = "up"
```

The Network Agent package provides a mapping table that maps field names to the OpenConfig key strings.

**Release History Table**

| Release | Description |
|---|---|
| 16.1R3 | Starting in Junos OS Release 16.1R3, you can use a set of remote procedure call (RPC) interfaces to configure the Junos Telemetry Interface and stream telemetry data using the gRPC framework. |

**Related Documentation**

- Installing the Network Agent Package (Junos Telemetry Interface) on page 10
- *Understanding Junos OS with Upgraded FreeBSD*

## Installing the Network Agent Package (Junos Telemetry Interface)

Starting with Junos OS Release 16.1R3, the Network Agent software package provides a framework to support OpenConfig and gRPC for the Junos Telemetry Interface. The Network Agent package functions as a gRPC server that terminates the OpenConfig remote procedure call (RPC) interfaces and streams the telemetry data according to the OpenConfig specification. The Network Agent package, which runs on the Routing Engine, implements local statistics collection and reports data to active telemetry stream subscribers.

Network Agent is available as a separate package only for Junos OS with Upgraded FreeBSD. For other versions of Junos OS, Network Agent functionality is embedded in the software. For more information about Junos OS with Upgraded FreeBSD, see *Understanding Junos OS with Upgraded FreeBSD*.

Network Agent for Junos OS software package has the following naming conventions:

- Package Name—This is **Network-Agent**.
- Architecture—This field indicates the CPU architecture of the platforms, such as **x86**.
- Application Binary Interface (ABI)—This field indicates the “word length” of the CPU architecture. Vales include **32** for 32-bit architectures and **64** for 64-bit architectures.
- Release—This field indicates the Junos OS release number, such as **16.1R3.16**.
- Package release and spin number—This field indicates the package version and spin number, such as **C1.1**.

All Network Agent packages are in tarred and gzipped (**.tgz**) format.

NOTE: Each version of the Network Agent package is supported on a single release of Junos OS only. The Junos OS version supported is identified by the Junos OS release number included in the Network Agent package name.

Examples of valid Network Agent package names including the following:

- **network-agent-x86-64-16.1R3.16-C1.0.tgz**
- **network-agent-x86-32-16.1R4.12-C1.1.tgz**

Before you begin:

- Install Junos OS Release 16.1R3 or later.
- Install the OpenConfig for Junos OS module. For more information, see "Installing the OpenConfig Package" on page 4.
- Install Secure Sockets Layer (SSL) certificates of authentication on your Juniper Networks device.

NOTE: Only server-based SSL authentication is supported. Client-based authentication is not supported.

To download and install the Network Agent package:

1. Using a Web browser, navigate to the All Junos Platforms software download URL on the Juniper Networks webpage: http://www.juniper.net/support/downloads/.
2. Select the name of the Junos OS platform for the software that you want to download.
3. Select the release number (the number of the software version that you want to download) from the **Release** drop-down list to the right of the Download Software page.
4. Select the **Software** tab.
5. In the **Tools** section of the **Software** tab, select the **Junos Network Agent** package for the release.
6. Log in to the Juniper Networks authentication system using the username (generally your e-mail address) and password supplied by a Juniper Networks representative.
7. Download the software to a local host.
8. Copy the software to Juniper Networks device or to your internal software distribution site.
9. Install the new **network-telemetry** package on the device by issuing the **request system software add** ***package-name*** from the operational mode:

   For example:

   ```
   user@host > request system software add
     network-telemetry-x86-64-16.1R3.16-C1.0.tgz
   ```

NOTE: The command uses the validate option by default. This option validates the software package against the current configuration as a prerequisite to adding the software package to ensure that the device reboots successfully. This is the default behavior when the software package being added is a different release.

Replace ***source*** with one of the following values:

- ***/pathname***—For a software package that is installed from a local directory on the device.
- For software packages that are downloaded and installed from a remote location:
  - ***ftp://hostname/pathname***
  - ***http://hostname/pathname***
  - ***scp://hostname/pathname*** (available only for Canada and U.S. version)

10. Issue the **show version** command to verify that the Network Agent package was successfully installed.

**Related Documentation**

- Understanding OpenConfig and gRPC on Junos Telemetry Interface on page 7

## gRPC Service Definition for OpenConfig Telemetry

Like many RPC systems, gRPC is based is based on defining a service, specifying the methods that can be called remotely with their parameters and return types. By default, gRPC uses protocol buffers as the Interface Definition Language (IDL) for describing both the service interface and the structure of the payload messages.

Following is the gRPC service definition for the **telemetrySubscribe** RPC:

```
//
//  na-openconfig-telemetry.proto
//  network-agent-gprc
//     This file defines the telemetry gRPC service implemented by  the
//     Network Agent that runs on Juniper devices.
//
syntax = "proto3";
package Telemetry;

service OpenConfigTelemetry {
    // Request an inline subscription for data at the specified path
    rpc telemetrySubscribe(SubscriptionRequest) returns (SubscriptionResponse)
{}
    // Get the list of current telemetry subscriptions from the
    // target.  This command returns a list of existing subscriptions
    // not including those that are established via configuration."
    rpc getTelemetrySubscriptions() returns (SubscriptionResponse) {}
    // Terminates and removes an existing telemetry subscription
    rpc cancelTelemetrySubscription(SubscriptionId) returns () {}
    // Retrieve operational state values of the given OC paths
    rpc getOperational(OpDataRequest) returns (OpDataReply) {}
    // Get the capabilities of the network device
    rpc getCapabilities() returns (capabilities) {}
}

message SubscriptionRequest {
    // List of optional collector endpoints to send data for
    // this subscription, specified as an ip+port combination.
    // If no collector destinations are specified, the collector
    // destination is inferred from requester on the rpc channel
```

```
    repeated Collector collectors = 1;
    // The DSCP code point to be set on telemetry messages
    uint32   export_dscp_marking  = 2;
    // List of paths for which telemetry is desired
    repeated Resource resources    = 3;
}

message Collector {
    // IP address of collector end point
    string ip_address   = 1;
    // Transport protocol port number for destination
    uint32 port = 2;
}

message Resource {
    // Datamodel path of interest
    Path path               = 1;

    // Regular expression used to filter out non interesting leaf nodes
    string filter           = 2;

    // The interval at which the value of a counter is reported
    int32  sample-frequency = 3;
}

message SubsscriptionResponse {
    SubscriptionId      id                 = 1;
    SubscriptionRequest actualSubscription = 2;
}

message SubscriptionId {
    uint32 id = 1;
}

message OpDataRequest {
    // Request header
    RequestHeader header = 1;

    // List of paths
    repeated Path paths = 2;

    // True if only operational paths need to be retrieved
    unit32 opOnly = 3;
}

message RequestHeader {
    // Request ID
    uint64 reqId = 1;
}

message Path {
    // Name of the Path
    string path = 1;
}

message OpDataReply {
    // Reply header
    ReplyHeader header = 1;
    // Response in path-value format
    repeated OpData keyvalues = 2;
}
```

```
message ReplyHeader {
    // Request ID
    uint64 reqId = 1;
    // Response code, success or failure
    uint32 rspCode = 2;
    // Info or error message
    string rspMsg = 3;
}

message OpData {
    // Name of the path
    string path = 1;
    // Value of the path
    string value = 2;
}

message Capabilities {
    // List of the paths
    repeated Capability capabilities = 1;
}

message Capability {
    // The resource path
    Path               path = 1;
    // The recommended polling interval
    uint32 polling_interva; = 2;
    // Whether this path supports filtering with regular expressions
    string filter_supported = 3;
}
```

**Related Documentation**

- Understanding OpenConfig and gRPC on Junos Telemetry Interface on page 7

## Guidelines for gRPC Sensors

Starting with Junos OS Release 16.1R3, the Junos Telemetry Interface supports gRPC remote procedure calls (gRPC) to provision sensors and to subscribe to and receive telemetry data. The following sensors are supported with gRPC. To activate a sensor, use the corresponding resource path. Each resource path enables data streaming for the system resource globally, that is, systemwide. You can also modify resource path, such as to specify a specific logical or physical interface. For example, to specify a specific interface, include the following at the end of the path: **[name='interface-name']/**

### Supported gRPC Sensors

See Table 5 on page 15 for a description of supported gRPC sensors and the subscription path you use to provision the sensors.

Table 5: gRPC Sensors

| resource path | Description |
|---|---|
| **/junos/services/label-switched-path/usage/** | Sensor for LSP statistics. Only ingress LSPs are supported. On MX Series routers only, the following are also supported: bypass LSPs, including those configured as ingress LSPs, and bidirectional LSPs for ultimate-hop popping (UHP).<br><br>NOTE: You can modify **/junos/services/label-switched-path/usage/** to specify a specific LSP. Add **__instance__/*lsp-name*** to the end of the resource path. For example, to monitor and stream data for LSP statistics for an LSP named mirror-to-murano-1, enter the following: **/junos/services/label-switched-path/usage/__instance__/mirror-to-murano-1**. If you do not specify a specific LSP name, the system resource monitors and streams data for all LSPs.<br><br>When you enable a sensor for LSP statistics only, you must also configure the **sensor-based-stats** statement at the **[edit protocols mpls]** hierarchy level. MX Series routers should operate in enhanced mode. If not enabled by default, include either the **enhanced-ip** or the **enhanced-ethernet** statement at the **[edit chassis network-services]** hierarchy level. |
| **/junos/npu-memory/** | Sensor for network processing unit (NPU) memory, NPU memory utilization, and total memory available for each memory type |
| **/junos/system/linecard/cpu/memory/** | Sensor for CPU memory. |
| **/bgp/neighbors/neighbor/**<br><br>**/bgp/peer-groups/peer-group/** | Sensor for BGP peer information.<br><br>NOTE:<br>You can also include the following at the end path to **/bgp/neighbors/neighbor/**:<br><br>• **state/session-state/**<br>• **state/messages/sent/update/**<br>• **state/messages/received/update/**<br>• **transport/state/local-address/**<br>• **transport/state/remote-address/**<br>• **state/peer-as/**<br>• **afi-safis-afi/safi/state/prefix-limit/state/max-prefixes/**<br>• **state/session-status/**<br>• **state/session-admin-status/**<br>• **state/established-transitions/**<br>• **state/interface-error/**<br>• **state/prefix-limited/exceeded/**<br>• **state/last-established/**<br><br>You can also include the following at the end path to **/bgp/peer-groups/peer-group/**:<br><br>• **afi-safis/afi-safi/ipv4-unicast/add-paths/eligible-prefix-policy/** |
| **/junos/services/routing/task-memory-utilization/** | Sensor for memory utilization for routing protocol task. |

Table 5: gRPC Sensors *(continued)*

| resource path | Description |
|---|---|
| **/junos/system/linecard/firewall/** | Sensor for firewall filter counters and policer counters. Each line card reports counters separately.<br><br>NOTE: Hierarchical policer statistics are collected for MX Series routers only. Traffic-class counter statistics are collected for PTX Series routers only.<br><br>Firewall counters are exported even if the interface to which the firewall filter is attached is operationally down. |
| **/junos/system/linecard/interface/** | Sensor for physical interface traffic.<br><br>NOTE: For PTX Series routers, for a specific interface, queue statistics are exported for each line card. For MX series routers, interface queue statistics are exported only from slot on which an interface is configured.<br><br>For Aggregated Ethernet interfaces, statistics are exported for the member physical interfaces. You must aggregate the counters at the destination server, or collector.<br><br>If a physical interface is administratively down or operationally down, interface counters are not exported. |
| **/interfaces/interface/subinterfaces/**<br><br>**/interfaces/interface[name='*interface-name*']/subinterfaces/** | Sensor for logical interface traffic.<br><br>NOTE: If a logical interface is operationally down, interface statistics continue to be exported. |
| **/junos/system/linecard/optics/** | Sensor for various optical interface performance metrics, such as transmit and receive power levels. |
| **/junos/rsvp-interface-information/** | Sensor for events and properties for RSVP interfaces.<br><br>NOTE: For 100 RSVP logical interfaces, configure a sampling interval equal to 60 seconds. For 200 RSVP logical interfaces, configure a sampling interval equal to 180 seconds. |
| **/components/** | Sensor for operational state of Routing Engines, power supply modules, Switch Fabric Boards, Control Boards, Switch Interface Boards, Modular Interface Cards, and Physical Interface Cards. |
| **/lacp/** | Sensor for operational state of aggregated Ethernet interfaces configured with the Link Aggregation Control Protocol. |
| **/lldp/** | Sensor for operational state of Ethernet interfaces enabled with the Link Layer Discovery Protocol. |
| **/arp-information/** | Sensor for Address Resolution Protocol (ARP) statistics. |

Table 5: gRPC Sensors *(continued)*

| resource path | Description |
|---|---|
| **/interfaces/interface[name='*interface-name*']/** | Sensor for Routing Engine internal interfaces.<br><br>NOTE: On MX Series routers, you can specify the following interfaces: fxp0, em0, and em1<br><br>On PTX Series routers, you can specify the following interfaces: em0, ixlv0, ixlv1<br><br>On PTX Series routers with dual Routing Engines, you can specify the following interfaces: em0, ixgbe0, ixgbe1 |
| **/nd6-information/** | Sensor for Network Discovery Protocol (NDP) table state. |
| **/ipv6-ra/** | Sensor for NDP router-advertisement statistics. |

**Related Documentation**

- Understanding OpenConfig and gRPC on Junos Telemetry Interface on page 7
- Example: gRPC Subscription for Telemetry Data on page 17

## Example: gRPC Subscription for Telemetry Data

This example shows how to use gRPC remote procedure calls (gRPC) to provision a sensor for logical interface statistics and to subscribe to and receive telemetry data. A management station serves as the collector for telemetry data streamed from the Juniper Networks device.

Before you begin, complete the following steps on your Juniper Networks device:

- Download and install Junos OS Release 16.1R3 or later.
- Download and install the OpenConfig for Junos OS module.
- If your Juniper Networks device is running a version of the Junos OS with the upgraded FreeBSD kernel, download and install the Network Agent package.

In this example, the management station requesting telemetry data has Python programming language modules installed. Python is used to write a program to specify the following parameters of the gRPC subscription request:

- Path of the system resource—**/interfaces**. This path specifies to stream data for all logical interfaces.
- Interval at which to report data, in milliseconds—**sample_frequency = 4000**

The **telemetrySubscribe** RPC is used to initiate the subscription. Data is returned in an OpenConfig key/value format in a Google protocol buffers (gpb) message.

### Telemetry Python Client Code

```
ip = "10.209.16.147"
port = 50051
_TIMEOUT_SECONDS = 55000000

def collectData (ip, port):
    channel = implementations.insecure_channel(ip, port)
    with agent_pb2.beta_create_OpenConfigTelemetry_stub(channel) as stub:
      try:
        # From subscription request for /interfaces with reporting rate
        # of 4000 millisecs
        # PS: It should be noted that SubscriptionRequest can take list of
        #     paths and their reporting rates. Here just for a simple example,
        #     only one path is demonstrated
        sub_req = agent_pb2.SubscriptionRequest()
        path_list = sub_req.path_list.add()
        path_list.path = "/interfaces"
        path_list.sample_frequency = 4000

        # Request: Subscribe for the above path and get the below resplies
        #       1. List of accespted paths and the reporting rate
        #       2. OpenConfig data
        data_itr = stub.telemetrySubscribe(sub_req, _TIMEOUT_SECONDS)

        # Reply 1: SubscriptionReply - Get the list of accepted paths as part
        #          of telemetrySubscribe. This will be filled as meta-data
        #          in the gRPC channel as a key-value pair with
        #          "init-response" as key

        metadata = data_itr.initial_metadata()
        if metadata:
              if metadata[0][0] == "init-response":
                metainfo = metadata[0][1]

                # Format the meta-data to SubscriptionReply
                subreply = agent_pb2.SubscriptionReply()
                subreply.SetInParent()
                google.protobuf.text_format.Merge(metainfo, subreply)
                print "\r\n"
                print "Subscription Reply in the form of Meta data"
                print "-------------------------------------------"
                print   subreply

        # Reply 2: OpenConfigData - Get the OpenConfig data
        #          streamed from the device
        print "\r\n"
        print "OpenConfigData reply as streaming response"
        print "------------------------------------------"
        for data in data_itr:
              if not data:
                print "Server returned NULL"
                next
              oc_data = ParseOpenConfigData(data)
              print oc_data

      except Exception, e:
        print 'Exception: ' + str(e)

def ParseOpenConfigData(data):
    msg = ""
```

```
    #if data.system_id :
    msg += "\nsystem_id:" + data.system_id + "\n"
    #if data.component_id:
    msg += "component_id:" + str(data.component_id) + "\n"

    if data.sub_component_id:
      msg += "sub_component_id:" + str(data.sub_component_id) + "\n"

    if data.path:
      msg += "path:" + data.path + "\n"

    msg += "sequence_number:" + str(data.sequence_number) + "\n"

    if data.timestamp:
     msg += "timestamp:" + str(data.timestamp) + "\n"

    for kv in data.kv:
      msg += "kv {\n"
      if kv.key :
        msg += "  " + "key:" + kv.key + "\n"

      oneofType = kv.WhichOneof("value")
      if oneofType == "int_value" :
        msg += "  " + "int_value:" + str(kv.int_value) + "\n"
      elif oneofType == "double_value" :
        msg += "  " + "double_value:" + str(kv.double_value) + "\n"
      elif oneofType == "uint_value" :
        msg += "  " + "uint_value:" + str(kv.uint_value) + "\n"
      elif oneofType == "sint_value" :
        msg += "  " + "sint_value:" + str(kv.sint_value) + "\n"
      elif oneofType == "bool_value" :
        msg += "  " + "bool_value:" + str(kv.bool_value) + "\n"
      elif oneofType == "str_value" :
        msg += "  " + "str_value:" + kv.str_value + "\n"
      elif oneofType == "bytes_value" :
        msg += "  " + "bytes_value:" + str(kv.bytes_value) + "\n"
      msg += "}\n"

    return msg

def run():
  collectData(ip, port)

if __name__ == '__main__':
  run()
```

After you initiate the subscription using this program, the following subscription reply is returned:

```
response {
  subscription_id: 1
}
path_list {
  path: "/interfaces"
  sample_frequency: 4000
}
```

Data is then streamed to the management station console as shown below:

```
system_id:choc-mx240-f
component_id:1
```

```
path:sensor_1000_1_2:/junos/system/linecard/interface/logical/usage/:/junos/system/linecard/interface/logical/usage/:PFE
sequence_number:0
timestamp:1477077921468
kv {
  key:__timestamp__
  uint_value:1477077921434
}
kv {
  key:__prefix__
  str_value:/interfaces/interface[name='ge-1/0/0']/subinterfaces/subinterface[index='0']/
}
kv {
  key:init-time
  int_value:1475784511
}
kv {
  key:operational-state
  str_value:down
}
kv {
  key:__prefix__
  str_value:/interfaces/interface[name='ge-1/0/0']/subinterfaces/subinterface[index='1']/
}
.
.
.
.
.
.
```

**Related Documentation**

- Understanding OpenConfig and gRPC on Junos Telemetry Interface on page 7

CHAPTER 3

# OpenConfig to Junos Mapping


- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36
- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47


## Mapping OpenConfig BGP Commands to Junos Configuration

Table 6 on page 21 to Table 10 on page 27 show the mapping of OpenConfig BGP commands with the relevant configuration in Junos.

### Table 6: Global BGP Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>**/bgp/global** | |
| As | **/config/as** | **set routing-options autonomous-system** ***as_number*** |
| Router-ID | **/config/router-id** | **set routing-options router-id** ***router-id*** |
| External-Route-Distance | **/default-route-distance/config/external-route-distance** | **set protocols bgp group** ***name*** **preference** ***preference*** |
| Internal-Route-Distance | **/default-route-distance/config/internal-route-distance** | **set protocols bgp group** ***name*** **preference** ***preference*** |
| Confederation | **/confederation/config/enable**<br>**/confederation/config/identifier**<br>**/confederation/config/member-as** | **set routing-options confederation** ***confederation_as***<br>**set routing-options confederation members** ***value*** |
| Allow-Multiple-AS | **/use-multiple-paths/config/enabled**<br>**/use-multiple-paths/ebgp/config/allow-multiple-as** | **set protocols bgp group** ***name*** **multipath multiple-as** |

Table 6: Global BGP Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| EBGP-Maximum-Paths | /use-multiple-paths/config/enabled<br>/use-multiple-paths/ebgp/config/maximum-paths | set chassis maximum-ecmp *number-of-next-hops* |
| IBGP-Maximum-Paths | /use-multiple-paths/ibgp/config/maximum-paths | set chassis maximum-ecmp *number-of-next-hops* |
| Graceful-Restart | /graceful-restart/config/enabled<br>/graceful-restart/config/restart-time<br>/graceful-restart/config/stale-routes-time<br>/graceful-restart/config/helper-only | set protocols bgp graceful-restart disable<br>set protocols bgp graceful-restart restart-time *restart -time*<br>set protocols bgp graceful-restart stale-routes-time *stale- routes -time* |

Table 7: Global AFI-SAFI Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>/bgp/global/afi-safi/afi-safi | |
| AFI-SAFI | /config/afi-safi-name<br>/config/enabled | set protocols bgp family *family* |
| Always-Compare-MED | /route-selection-options/config/always-compare-med | set protocols bgp path-selection always-compare-med |
| Ignore-AS-Path-Length | /route-selection-options/config/ignore-as-path-length | set protocols bgp path-selection as-path-ignore |
| Enable-AIGP | /route-selection-options/config/enable-aigp | set protocols bgp family *family* aigp |
| Ignore-Nexthop-IGP-Metric | /route-selection-options/config/ignore-next-hop-igp-metric | Not supported |
| Use-Multiple-Paths | /use-multiple-paths/ebgp/config/<br>/use-multiple-paths/ibgp/config/ | Not supported |
| Apply-Policy | /apply-policy/ | Not supported |
| IPv4-Unicast: Max-Prefixes | /ipv4-unicast/prefix-limit/config/max-prefixes | set protocols bgp family inet unicast accepted-prefix-limit maximum *maximum* |
| IPv4-Unicast: Shutdown-Threshold-PCT | /ipv4-unicast/prefix-limit/config/shutdown-threshold-pct | set protocols bgp family inet unicast accepted-prefix-limit teardown *limit-threshold* |
| IPv4-Unicast: Restart-Timer | /ipv4-unicast/prefix-limit/config/restart-timer | set protocols bgp family inet unicast accepted-prefix-limit teardown idle-timeout *timeout* |

Table 7: Global AFI-SAFI Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| IPv4-Unicast: Send-Default-Route | **/ipv4-unicast/config/send-default-route** | Not supported |
| IPv6-Unicast: Max-Prefixes | **/ipv6-unicast/prefix-limit/config/max-prefixes** | **set protocols bgp family inet6 unicast accepted-prefix-limit maximum** ***maximum*** |
| IPv6-Unicast: Shutdown-Threshold-PCT | **/ipv6-unicast/prefix-limit/ config/shutdown-threshold-pct** | **set protocols bgp family inet6 unicast accepted-prefix-limit teardown** ***limit-threshold*** |
| IPv6-Unicast: Restart-Timer | **/ipv6-unicast/prefix-limit/config/restart-timer** | **set protocols bgp family inet6 unicast accepted-prefix-limit teardown idle-timeout** ***timeout*** |
| IPv6-Unicast: Send-Default-Route | **/ipv6-unicast/config/send-default-route** | Not supported |
| IPv4-Lbl-Unicast: Max-Prefixes | **/ipv4-labeled-unicast/prefix-limit/ config/max-prefixes** | **set protocols bgp family inet labeled-unicast accepted-prefix-limit maximum** ***maximum*** |
| IPv4-Lbl-Unicast: Shutdown-Threshold-PCT | **/ipv4-labelled-unicast/prefix-limit/ config/shutdown-threshold-pct** | **set protocols bgp family inet labeled-unicast accepted-prefix-limit teardown** ***limit-threshold*** |
| IPv4-Lbl-Unicast: Restart-Timer | **/ipv4-labelled-unicast/prefix-limit/ config/restart-timer** | **set protocols bgp family inet labeled-unicast accepted-prefix-limit teardown idle-timeout** ***timeout*** |
| IPv6-Lbl-Unicast: Max-Prefixes | **/ipv6-labelled-unicast/prefix-limit/ config/max-prefixes** | **set protocols bgp family inet6 labeled-unicast accepted-prefix-limit maximum** ***maximum*** |
| IPv6-Lbl-Unicast: Shutdown-Threshold-PCT | **/ipv6-labelled-unicast/prefix-limit/ config/shutdown-threshold-pct** | **set protocols bgp family inet6 labeled-unicast accepted-prefix-limit teardown** ***limit-threshold*** |
| IPv6-Lbl-Unicast: Restart-Timer | **/ipv6-labelled-unicast/prefix-limit/ config/restart-timer** | **set protocols bgp family inet6 labeled-unicast accepted-prefix-limit teardown idle-timeout** ***timeout*** |
| L3VPN-IPv4-Ucast: Max-Prefixes | **/l3vpn-ipv4-unicast/prefix-limit/ config/max-prefixes** | **set protocols bgp family inet-vpn unicast accepted-prefix-limit maximum** ***maximum*** |
| L3VPN-IPv4-Ucast: Shutdown-Threshold-PCT | **/l3vpn-ipv4-unicast/prefix-limit/ config/shutdown-threshold-pct** | **set protocols bgp family inet-vpn unicast accepted-prefix-limit teardown** ***limit-threshold*** |
| L3VPN-IPv4-Ucast: Restart-Timer | **/l3vpn-ipv4-unicast/prefix-limit/ config/restart-timer** | **set protocols bgp family inet-vpn unicast accepted-prefix-limit teardown idle-timeout** ***timeout*** |

Table 7: Global AFI-SAFI Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| L3VPN-IPv6-Ucast: Max-Prefixes | **/l3vpn-ipv6-unicast/prefix-limit/config/max-prefixes** | **set protocols bgp family inet6-vpn unicast accepted-prefix-limit maximum *maximum*** |
| L3VPN-IPv6-Ucast: Shutdown-Threshold-PCT | **/l3vpn-ipv6-unicast/prefix-limit/config/shutdown-threshold-pct** | **set protocols bgp family inet6-vpn unicast accepted-prefix-limit teardown *limit-threshold*** |
| L3VPN-IPv4-Ucast: Restart-Timer | **/l3vpn-ipv6-unicast/prefix-limit/config/restart-timer** | **set protocols bgp family inet6-vpn unicast accepted-prefix-limit teardown idle-timeout *timeout*** |
| L3VPN-IPv4-Mcast: Max-Prefixes | **/l3vpn-ipv4-multicast/prefix-limit/config/max-prefixes** | **set protocols bgp family inet-vpn multicast accepted-prefix-limit maximum *maximum*** |
| L3VPN-IPv4-Mcast: Shutdown-Threshold-PCT | **/l3vpn-ipv4-multicast/prefix-limit/config/shutdown-threshold-pct** | **set protocols bgp family inet-vpn multicast accepted-prefix-limit maximum *maximum*** |
| L3VPN-IPv4-Mcast: Restart-Timer | **/l3vpn-ipv4-multicast/prefix-limit/config/restart-timer** | **set protocols bgp family inet-vpn multicast accepted-prefix-limit teardown idle-timeout *timeout*** |
| L3VPN-IPv6-Mcast: Max-Prefixes | **/l3vpn-ipv6-multicast/prefix-limit/config/max-prefixes** | **set protocols bgp family inet6-vpn multicast accepted-prefix-limit maximum *maximum*** |
| L3VPN-IPv6-Mcast: Shutdown-Threshold-PCT | **/l3vpn-ipv6-multicast/prefix-limit/config/shutdown-threshold-pct** | **set protocols bgp family inet6-vpn multicast accepted-prefix-limit teardown *limit-threshold*** |
| L3VPN-IPv6-Mcast: Restart-Timer | **/l3vpn-ipv6-multicast/prefix-limit/config/restart-timer** | **set protocols bgp family inet6-vpn multicast accepted-prefix-limit teardown idle-timeout *timeout*** |
| L2VPN-VPLS: Max-Prefixes | **/l2vpn-vpls/prefix-limit/config/max-prefixes** | **set protocols bgp family l2vpn signaling accepted-prefix-limit maximum *maximum*** |
| L2VPN-VPLS: Shutdown-Threshold-PCT | **/l2vpn-vpls/prefix-limit/config/shutdown-threshold-pct** | **set protocols bgp family l2vpn signaling accepted-prefix-limit teardown *limit-threshold*** |
| L2VPN-VPLS: Restart-Timer | **/l2vpn-vpls/prefix-limit/config/restart-timer** | **set protocols bgp family l2vpn signaling accepted-prefix-limit teardown idle-timeout *timeout*** |
| L2VPN-EVPN: Max-Prefixes | **/l2vpn-evpn/prefix-limit/config/max-prefixes** | **set protocols bgp family evpn signaling accepted-prefix-limit maximum *maximum*** |
| L2VPN-EVPN: Shutdown-Threshold-PCT | **/l2vpn-evpn/prefix-limit/config/shutdown-threshold-pct** | **set protocols bgp family evpn signaling accepted-prefix-limit teardown *limit-threshold*** |

Table 7: Global AFI-SAFI Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| L2VPN-EVPN: Restart-Timer | **/l2vpn-evpn/prefix-limit/config/restart-timer** | **set protocols bgp family evpn signaling accepted-prefix-limit teardown idle-timeout *timeout*** |

Table 8: Global Apply-Policy Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>**/bgp/global/apply-policy** | |
| Import-Policies | **/import-policies** | **set protocols bgp import *value*** |
| Default-Import-Policy | **/default-import-policy** | **set protocols bgp import *value*** |
| Export-Policies | **/export-policies** | **set protocols bgp export *value*** |
| Default-Import-Policy | **/default-export-policy** | **set protocols bgp export *value*** |

Table 9: Peer-Group Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>**/bgp/peer-groups/peer-group** | |
| Peer-Group-Name | **/config/peer-group-name** | **set protocols bgp group *group-name*** |
| Peer-AS | **/config/peer-as** | **set protocols bgp group *group-name* peer-as *peer-as*** |
| Peer-Type | **/config/peer-type** | **set protocols bgp group *group-name* type <external \| internal>** |
| Auth-Password | **/config/auth-password** | **set protocols bgp group *group-name* authentication-key *authentication-key*** |
| Remove-Private-AS | **/config/remote-private-as** | **set protocols bgp group *group-name* remove-private all**<br><br>**set protocols bgp group *group-name* remove-private all replace** |

Table 9: Peer-Group Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Route-Flap-Damping | **/config/route-flap-damping** | **set protocols bgp group** ***group-name*** **damping** |
| Send-Community | **/config/send-community** | Not supported |
| Description | **/config/description** | **set protocols bgp group** ***group-name*** **description** ***description*** |
| Timers: Connect-Retry | **/timers/config/connect-retry** | **set protocols bgp group** ***group-name*** **connect-retry-interval** ***connect-retry*** |
| Timers: Hold-Time | **/timers/config/hold-time** | **set protocols bgp group** ***group-name*** **hold-time** ***hold-time*** |
| Timers: Keepalive-Interval | **/timers/config/keepalive-interval** | Not supported |
| Timers: Minimum-Advertisement-Interval | **/timers/config/minimum-advertisement-interval** | **set protocols bgp group** ***group-name*** **out-delay** ***out-delay*** |
| Timers: Send-Update-Delay | **/timers/config/send-update-delay** | Not supported |
| Transport: TCP-MSS | **/transport/config/tcp-mss** | **set protocols bgp group** ***group-name*** **tcp-mss** ***tcp-mss*** |
| Transport: MTU-Discovery | **/transport/config/mtu-discovery** | **set protocols bgp group** ***group-name*** **mtu-discovery** |
| Transport: Passive-Mode | **/transport/config/passive-mode** | **set protocols bgp group** ***group-name*** **passive** |
| Transport: Local-Address | **/transport/config/local-address** | **set protocols bgp group** ***group-name*** **local-address** ***local-address*** |
| Error-Handling: Treat-AS-Withdraw | **/error-handling/config/treat-as-withdraw** | **set protocols bgp group** ***group-name*** **bgp-error-tolerance** |
| Logging-Options: Log-Neighbor-State-Changes | **/logging-options/config/log-neighbor-state-changes** | **set protocols bgp group** ***group-name*** **log-updown** |
| EBGP-Multihop: MultiHop-TTL | **/ebgp-multihop/config/multihop-ttl** | **set protocols bgp group** ***group-name*** **multihop ttl** ***ttl*** |
| Route-Reflector: Route-Reflector-Cluster-ID | **/route-reflector/config/route-reflector-cluster-id** | **set protocols bgp group** ***group-name*** **cluster** ***cluster*** |
| Route-Reflector: Route-Reflector-Client | **/route-reflector/config/route-reflector-client** | **set protocols bgp group** ***group-name*** **no-client-reflect** |

Table 9: Peer-Group Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| AS-Path-Options: Allow-Own-AS | **/as-path-options/config/allow-own-as** | **set protocols bgp group *group-name* local-as loops *loops*** |
| AS-Path-Options: Replace-Peer-AS | **/as-path-options/config/replace-peer-as** | **set protocols bgp group *group-name* as-override** |
| Add-Paths: Receive | **/add-paths/config/receive** | **set protocols bgp group *group-name* family *family* add-path receive** |
| Add-Paths: Send-Max | **/add-paths/config/send-max** | **set protocols bgp group *group-name* family *family* add-path send path-count *path-count*** |
| Add-Paths: Eligible Prefix Policy | **/add-paths/config/eligible-prefix-policy** | **set protocols bgp group *group-name* family *family* add-path send prefix-policy *policy*** |
| AFI-SAFI | **/afi-safi/afi-safi/** | Not supported |
| Graceful-Restart | **/graceful-restart/config/** | Not supported |
| Apply-Policy | **/apply-policy/** | Not supported |

Table 10: Neighbors Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>**/bgp/neighbors/neighbor** | |
| Neighbor-Address | **/neighbor-address** | **set protocols bgp group *group-name* neighbor *address*** |
| Peer-AS | **/config/peer-as** | **set protocols bgp group *group-name* neighbor *address* peer-as *peer-as*** |
| Peer-Type | **/config/peer-type** | **set protocols bgp group *group-name* type *<external\|internal>*** |
| Auth-Password | **/config/auth-password** | **set protocols bgp group *group-name* neighbor *address* authentication-key *authentication-key*** |

Table 10: Neighbors Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Remove-Private-AS | **/config/remote-private-as** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **remove-private all**<br><br>**set protocols bgp group** ***group-name*** **neighbor** ***address*** **remove-private all replace** |
| Route-Flap-Damping | **/config/route-flap-damping** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **damping** |
| Send-Community | **/config/send-community** | Not supported |
| Description | **/config/description** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **description** |
| Peer-Group | **/config/peer-group** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** |
| Timers – Connect-Retry | **/timers/config/connect-retry** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **connect-retry-interval** |
| Timers – Hold-Time | **/timers/config/hold-time** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **hold-time** ***hold-time*** |
| Timers - Keepalive-Interval | **/timers/config/keepalive-interval** | Not supported |
| Timers – Minimum-Advertisement-Interval | **/timers/config/minimum-advertisement-interval** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **out-delay** ***out-delay*** |
| Timers - Send-Update-Delay | **/timers/config/send-update-delay** | Not supported |
| Transport – TCP-MSS | **/transport/config/tcp-mss** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **tcp-mss** ***tcp-mss*** |
| Transport – MTU-Discovery | **/transport/config/mtu-discovery** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **mtu-discovery** |
| Transport – Passive-Mode | **/transport/config/passive-mode** | **set protocols bgp group** ***group-name*** **neighbor** ***address*** **passive** |

Table 10: Neighbors Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Transport – Local-Address | **/transport/config/local-address** | **set protocols bgp group *group-name* neighbor *address* local-address *local-address*** |
| Error-Handling – Treat-AS-Withdraw | **/error-handling/config/treat-as-withdraw** | **set protocols bgp group *group-name* neighbor *address* bgp-error-tolerance** |
| Logging-Options – Log-Neighbor-State-Changes | **/logging-options/config/log-neighbor-state-changes** | **set protocols bgp group *group-name* neighbor *address* log-updown** |
| EBGP-Multihop – Multihop-TTL | **/ebgp-multihop/config/multihop-ttl** | **set protocols bgp group *group-name* neighbor *address* multihop ttl *ttl*** |
| Route-Reflector – Route-Reflector-Cluster-ID | **/route-reflector/config/route-reflector-cluster-id** | **set protocols bgp group *group-name* neighbor *address* cluster *cluster*** |
| Route-Reflector – Route-Reflector-Client | **/route-reflector/config/route-reflector-client** | **set protocols bgp group *group-name* neighbor *address* no-client-reflect** |
| AS-Path-Options – Allow-Own-AS | **/as-path-options/config/allow-own-as** | **set protocols bgp group *group-name* neighbor *address* local-as loops *loops*** |
| AS-Path-Options – Replace-Peer-AS | **/as-path-options/config/replace-peer-as** | **set protocols bgp group *group-name* neighbor *address* as-override** |
| Add-Paths - Receive | **/add-paths/config/receive** | **set protocols bgp group *group-name* neighbor *address* family *family* add-path receive** |
| AS-Path-Options – Send-Max | **/add-paths/config/send-max** | **set protocols bgp group *group-name* neighbor *address* family *family* add-path send path-count *path-count*** |
| Add-Paths: Eligible Prefix Policy | **/add-paths/config/eligible-prefix-policy** | **set protocols bgp group *group-name* neighbor *ip* family *family* add-path send prefix-policy** |
| AFI-SAFI | **/afi-safi/afi-safi/** | Not supported |
| Graceful-Restart | **/graceful-restart/config/** | Not supported |
| Apply-Policy | **/apply-policy/** | Not supported |

**Related Documentation**

- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36

## Mapping OpenConfig Interface Commands to Junos Configuration

Table 11 on page 30 to Table 18 on page 34 shows the mapping of OpenConfig interface commands to the relevant configuration in Junos.

### Table 11: VRRP Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Virtual Router ID | ifa/vrrp/vrrp-group/config/virtual-router-id | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* |
| Virtual Address | ifa/vrrp/vrrp-group/config/virtual-address | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* virtual-address *address*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* virtual-inet6-address |
| VRRP Priority | ifa/vrrp/vrrp-group/config/priority | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* priority<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* priority |
| VRRP Preempt | ifa/vrrp/vrrp-group/config/preempt | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* preempt<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* preempt |

Table 11: VRRP Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| VRRP Preempt Hold Time | ifa/vrrp/vrrp-group/config/preempt-delay | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* preempt hold-time *time*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* preempt hold-time *time* |
| Accept Data | ifa/vrrp/vrrp-group/config/accept_mode | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* accept-data<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* accept-data |
| Advertise Interval | ifa/vrrp/vrrp-group/config/advertisement_interval | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* advertise-interval<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* inet6-advertise-interval |
| Track Interface | ifa/vrrp/vrrp-group/interface-tracking/config/track-interface | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* track interface *interface-name*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* track interface *interface-name* |
| Priority Cost | ifa/vrrp/vrrp-group/interface-tracking/config/priority-decrement | set interfaces *interface-name* unit *unit-number* family inet address *address* vrrp-group *virtual-router-id* track interface *interface-name* priority-cost *cost*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* track interface *interface-name* priority-cost *cost* |
| Virtual Link Local Address | ifa/vrrp/vrrp-group/config/virtual-link-local | set interfaces *interface-name* unit *unit-number* family inet6 address *address* vrrp-inet6-group *virtual-router-id* virtual-link-local-address |

### Table 12: IPv4 and IPv6 Address Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Configuration Address | ipv4/addresses/address/ip<br><br>ipv4/addresses/address/prefix-length | set interfaces *interface-name* unit *unit-number* family inet address *address*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* |
| Neighbor Address | ipv4/neighbors/neighbor/ip<br><br>ipv6/neighbors/neighbor/ip | set interfaces *interface-name* unit *unit-number* family inet address *address* arp *address*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* ndp *address* |
| Link Layer Address | ip4/neighbors/neighbor/ip/link-layer-address<br><br>ip6/neighbors/neighbor/ip/link-layer-address | set interfaces *interface-name* unit *unit-number* family inet address *address* arp *address* mac *address*<br><br>set interfaces *interface-name* unit *unit-number* family inet6 address *address* ndp *address* mac *address* |

### Table 13: Interface AE Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| LAG Type | /aggregation/config/lag-type/lacp<br><br>/aggregation/config/lag-type/static | set interfaces *ae-name* aggregated-ether-options lacp |
| Minimum Links | /aggregation/config/min-links | set interfaces *ae-name* aggregated-ether-options minimum-links |

### Table 14: LACP Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| LACP Interval | /lacp/interfaces/interface/config/interval | set interfaces *ae-name* aggregated-ether-options lacp periodic fast<br><br>set interfaces *ae-name* aggregated-ether-options lacp periodic slow |
| LACP Mode | /lacp/interfaces/interface/config/lacp-mode | set interfaces *ae-name* aggregated-ether-options lacp active<br><br>set interfaces *ae-name* aggregated-ether-options lacp passive |
| System ID | /lacp/interfaces/interface/config/system-id-mac | set interfaces *ae-name* aggregated-ether-options lacp system-id *address* |
| System Priority | /lacp/interfaces/interface/config/system-priority | set interfaces *ae-name* aggregated-ether-options lacp system-priority *system-priority* |

Table 14: LACP Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Ethernet Options | /lacp/interfaces/interface/members/member | set interface *interface* gigether-options 802.3ad<br>set interface *interface* fastether-options 802.3ad<br>set interface *interface* ether-options 802.3ad |

Table 15: Member Interface Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Aggregate ID | /interface/aggregate-id | set interface *interface* gigether-options 802.3ad *aggregate-id*<br>set interface *interface* fastether-options 802.3ad *aggregate-id*<br>set interface *interface* ether-options 802.3ad *aggregate-id* |

Table 16: Ethernet Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Auto-negotiate | /ethernet/config/auto-negotiate | set interfaces *interface* gigether-options *auto-negotiation/no-auto-negotiation* |
| MAC Address | /ethernet/config/mac-address | set interfaces *interface* mac |
| Duplex Mode | /ethernet/config/duplex-mode | set interfaces *interface* link-mode |
| Port Speed | /ethernet/config/port-speed | set interface *interface* speed |
| Flow Control | /ethernet/config/enable-flow-control | set interface *interface* gigether-options flow-control |

Table 17: IFD Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Interface Type | /interfaces/*interface*/config/type | Not supported.<br>Type is derived from the interface name. |
| Interface MTU | /interfaces/*interface*/config/mtu | set interface *interface* mtu |
| Interface Name | /interfaces/*interface*/config/name | set interface *interface* |
| Interface Description | /interfaces/*interface*/config/description | set interface *interface* description |
| Interface Enabled/Disabled | /interfaces/*interface*/config/enabled | set interface *interface* disabled<br>set interface *interface* enabled |

Table 17: IFD Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Hold Time Up | /interfaces/*interface*/config/hold-time/config/up | set interface *interface* hold-time up |
| Hold Time Down | /interfaces/*interface*/config/hold-time/config/down | set interface *interface* hold-time down |

Table 18: IFL Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Unit Name | /interfaces/*interface*/subinterfaces/subinterface/config/index | set interfaces *interface* unit *unit* |
| Unnumbered Address | /interfaces/*interface*/config/subinterfaces/subinterface/config/unnumbered | set interfaces *interface* unit *unit* family *family* unnumbered-address source *ifl* |
| Unit Description | /interfaces/*interface*/subinterfaces/subinterface/config/description | set interfaces *interface* unit *unit* description |
| Unit Enabled/Disabled | /interfaces/*interface*/subinterfaces/subinterface/config/enabled | set interfaces *interface* unit *unit* enabled<br><br>set interfaces *interface* unit *unit* disabled |
| Interface Alias | /interfaces/*interface*/subinterfaces/subinterface/config/name | set interfaces *interface* alias |

**Related Documentation**

- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47
- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36

## Mapping OpenConfig LLDP Commands to Junos Configuration

Table 19 on page 34 and Table 20 on page 35 show the mapping of OpenConfig LLDP commands with the relevant configuration in Junos.

Table 19: Global LLDP Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Enable | /lldp/config/enabled | set protocols lldp *enable/disable* |

Table 19: Global LLDP Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Hello time | /lldp/config/hello-timer | set protocols lldp advertisement-interval *advertisement-interval* |
| System Information | /lldp/config/suppress-tlv-advertisement<br>/lldp/config/system-name<br>/lldp/config/system-description<br>/lldp/config/chassis-id<br>/lldp/config/chassis-id-type | Not supported |

Table 20: Interface Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Interface Config | /lldp/interfaces/interface/config/name<br>/lldp/interfaces/interface/config/enabled | set protocols lldp interface *interface-name* enable |

**Related Documentation**

- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36

## Mapping OpenConfig Local Routing Commands to Junos Configuration

Table 21 on page 35 and Table 22 on page 36 show the mapping of OpenConfig local routing commands to the relevant configuration in Junos.

Table 21: Static Route Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>/local-routes/static-routes | |
| Local Static Prefix | /static/config/prefix | set routing-options static route *prefix* |
| Local Static Next Hop | /static/config/prefix<br>/static/config/next-hop/*ip-address*<br>/static/config/next-hop/*local-defined-next-hop*<br>/static/config/next-hop/*string* | set routing-options static route *prefix* next-hop (*address* \| *interface*)<br>set routing-options static route *prefix* discard |

Table 21: Static Route Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Local Static Tag | **/static/config/prefix**<br>**/static/config/set-tag** | **set routing-options static route *prefix* tag *tag*** |

Table 22: Local Aggregate Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br>**/local-routes/local-aggregates** | |
| Local Aggregate Prefix | **/aggregate/config/prefix** | **set routing-options aggregate route *prefix*** |
| Local Aggregate Discard | **/aggregate/config/prefix**<br>**/aggregate/config/discard** | **set routing-options aggregate route *prefix* discard** |
| Local Aggregate Tag | **/aggregate/config/prefix**<br>**/aggregate/config/set-tag** | **set routing-options aggregate route *prefix* tag *tag*** |

**Related Documentation**

- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36
- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47

## Mapping OpenConfig MPLS Commands to Junos Configuration

Table 23 on page 36 to Table 28 on page 44 show the mapping of OpenConfig MPLS commands with the relevant configuration in Junos.

Table 23: Global MPLS Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Explicit Null | **/mpls/global/config/null-label/explicit**<br>**/mpls/global/config/null-label/implicit** | **set protocols mpls explicit-null** |

Table 23: Global MPLS Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Interface | /mpls/global/interface-attributes/interface/config/interface-id<br><br>/mpls/global/interface-attributes/interface/config/mpls-enabled<br><br>/mpls/global/interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/global/interface-attributes/interface/interface-ref/config/subinterface | set protocols mpls interface *interface*<br><br>set protocols mpls interface *interface* disable |

Table 24: TE Global Attributes

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| SRLGs | /mpls/te-global-attributes/srlg/srlg/config/name | Flooded:<br><br>set routing-options srlg *name*<br><br>Static:<br><br>set routing-options fate-sharing group *name* |
| SRLG Value | /mpls/te-global-attributes/srlg/srlg/config/value | set routing-options fate-sharing group *name* srlg-value *value* |
| SRLG Cost | /mpls/te-global-attributes/srlg/srlg/config/cost | Flooded:<br><br>set routing-options srlg *name* srlg-cost *cost*<br><br>Static:<br><br>set routing-options fate-sharing group *name* cost *cost* |
| Address | /mpls/te-global-attributes/srlg/srlg/static-srlg-members/members-list/config/from-address<br><br>/mpls/te-global-attributes/srlg/srlg/static-srlg-members/members-list/config/to-address | set routing-options fate-sharing group *name* from *address* to *address* |
| Admin Groups | /mpls/te-global-attributes/mpls-admin-groups/admin-group/config/admin-group-name<br><br>/mpls/te-global-attributes/mpls-admin-groups/admin-group/config/bit-position | Bit position (group-value) 0-31:<br><br>set protocols mpls admin-groups *group-name group-value*<br><br>Bit position (group-value) 32-4294967295:<br><br>set routing-options admin-groups-extended *group-name* group-value *group-value* |

Table 24: TE Global Attributes *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Delay | /mpls/te-global-attributes/te-lsp-timers/config/install-delay<br><br>/mpls/te-global-attributes/te-lsp-timers/config/cleanup-delay<br><br>/mpls/te-global-attributes/te-lsp-timers/config/reoptimize-timer | set protocols mpls optimize-switchover-delay *delay*<br><br>set protocols mpls optimize-hold-dead-delay *delay*<br><br>set protocols mpls optimize-timer *timer* |

Table 25: TE Interface Attributes

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| TE Interface | /mpls/te-interface-attributes/interface/config/interface-id<br><br>/mpls/te-interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/te-interface-attributes/interface/interface-ref/config/subinterface | set protocols ospf area *id* interface *interface* |
| TE Metric | /mpls/te-interface-attributes/interface/config/te-metric | set protocols ospf area *id* interface *interface* te-metric *te-metric*<br><br>set protocols isis interface *interface* level *level* te-metric *te-metric* |
| SRLG Membership | /mpls/te-interface-attributes/interface/config/srlg-membership | set protocols mpls interface *name* srlg *name* |
| Admin Groups | /mpls/te-interface-attributes/interface/config/admin-group | If protocols mpls admin-groups *name* is configured:<br><br>set protocols mpls interface *name* admin-group *name*<br><br>If routing-options admin-groups-extended *name* is configured:<br><br>set protocols mpls interface *name* admin-group-extended *name* |

Table 25: TE Interface Attributes *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| IGP Flooding Bandwidth | /mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/threshold-type<br>/mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/delta-percentage | set protocols rsvp interface *name* update-threshold *threshold* |
| | /mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/threshold-specification<br>/mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/up-thresholds<br>/mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/down-thresholds<br>/mpls/te-interface-attributes/interface/igp-flooding-bandwidth/config/up-down-thresholds | Not supported |

Table 26: RSVP Signaling Protocols

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Graceful Restart | /mpls/signaling-protocols/rsvp-te/global/graceful-restart/config/enable<br>/mpls/signaling-protocols/rsvp-te/global/graceful-restart/config/restart-time<br>/mpls/signaling-protocols/rsvp-te/global/graceful-restart/config/recovery-time | set protocols rsvp graceful-restart enable<br>set protocols rsvp graceful-restart maximum-helper-recovery-time *time*<br>set protocols rsvp graceful-restart maximum-helper-restart-time *time* |
| Cleanup Timer | /mpls/signaling-protocols/rsvp-te/global/soft-preemption/config/enable<br>/mpls/signaling-protocols/rsvp-te/global/soft-preemption/config/soft-preemption-timeout | set protocols rsvp preemption soft-preemption cleanup-timer *timer* |
| Hello Interval (All Interfaces) | /mpls/signaling-protocols/rsvp-te/global/hellos/config/hello-interval<br>/mpls/signaling-protocols/rsvp-te/global/hellos/config/refresh-reduction | set protocols rsvp interface all hello-interval *interval*<br>set protocols rsvp interface all no-reliable |

Table 26: RSVP Signaling Protocols *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Hello Interval (Single Interface) | /mpls/signaling-protocols/rsvp-te/interface-attributes/interface/config/interface-id<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/config/interface-name<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/hellos/config/hello-interval<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/hellos/config/refresh-reduction | set protocols rsvp interface *name* hello-interval *interval*<br><br>set protocols rsvp interface *name* no-reliable |
| Authentication Key | /mpls/signaling-protocols/rsvp-te/interface-attributes/interface/config/interface-id<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/subinterface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/authentication/config/enable<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/authentication/config/authentication-key | set protocols rsvp interface *name* authentication-key *key* |
| Subscription | /mpls/signaling-protocols/rsvp-te/interface-attributes/interface/config/interface-id<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/subinterface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/subscription/config/subscription | set protocols rsvp interface *name* subscription *subscription* |

Table 26: RSVP Signaling Protocols *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Link Protection | /mpls/signaling-protocols/rsvp-te/interface-attributes/interface/config/interface-id<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/interface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/interface-ref/config/subinterface<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/protection/config/link-protection-style-requested/unprotected<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/protection/config/link-protection-style-requested/link-protection-requested<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/protection/config/link-protection-style-requested/link-node-protection-requested<br><br>/mpls/signaling-protocols/rsvp-te/interface-attributes/interface/protection/config/bypass-optimize-interval | set protocols rsvp interface *name* link-protection<br><br>To disable node-protection:<br><br>set protocols rsvp interface *name* link-protection no-node-protection<br><br>set protocols rsvp interface *name* link-protection optimize-timer *timer* |

Table 27: Label Switched Paths

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Path | /mpls/lsps/constrained-path/named-explicit-paths/config/name<br><br>/mpls/lsps/constrained-path/named-explicit-paths/explicit-route-objects/config/address<br><br>/mpls/lsps/constrained-path/named-explicit-paths/explicit-route-objects/config/hop-type<br><br>/mpls/lsps/constrained-path/named-explicit-paths/explicit-route-objects/config/index | set protocols mpls path *name address hop-type* |
| Name | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/config/signaling-protocol/path-setup-rsvp | set protocols mpls label-switched-path *name* |
| Description | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/config/description | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* description *description* |
| Admin-Status | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/config/admin-status | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* disable |

Table 27: Label Switched Paths *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Preference | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/preference | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* preference *preference* |
| Metric | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnels/tunnel/config/metric-type<br>/mpls/lsps/constrained-path/tunnels/tunnel/config/shortcut-eligible<br>/mpls/lsps/constrained-path/tunnel/config/metric | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* metric *metric* |
| Link Protection | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/protection-style-requested/unprotected<br>/mpls/lsps/constrained-path/tunnel/config/protection-style-requested/link-protection-requested<br>/mpls/lsps/constrained-path/tunnel/config/protection-style-requested/link-node-protection-requested | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* link-protection<br>set protocols mpls label-switched-path *name* node-link-protection |
| Optimize Timer | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/reoptimize-timer | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* optimize-timer *timer* |
| Source | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/source | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* from *from* |
| Soft Preemption | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/soft-preemption | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* soft-preemption |
| Priority | /mpls/lsps/constrained-path/tunnel/config/name<br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br>/mpls/lsps/constrained-path/tunnel/config/setup-priority<br>/mpls/lsps/constrained-path/tunnel/config/hold-priority | set protocols mpls label-switched-path *name*<br>set protocols mpls label-switched-path *name* priority *setup reservation* |

Table 27: Label Switched Paths *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Bandwidth | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/config/specification-type/specified<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/config/set-bandwidth | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* bandwidth *bandwidth* |
| Min/Max Bandwidth | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/config/specification-type/auto<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/config/enabled<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/config/min-bw<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/config/max-bw<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/config/adjust-interval<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/config/adjust-threshold | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* minimum-bandwidth *minimum*<br><br>set protocols mpls label-switched-path *name* maximum-bandwidth *maximum*<br><br>set protocols mpls label-switched-path *name* adjust-interval *interval*<br><br>set protocols mpls label-switched-path *name* adjust-threshold *threshold* |
| Overflow Bandwidth | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/config/specification-type/auto<br><br>/mpls/lsps/constrained-path/tunnel/auto-bandwidth/overflow/config/enabled<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/overflow/config/overflow-threshold<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/overflow/config/trigger-event-count | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* auto-bandwidth adjust-threshold-overflow-limit |

Table 27: Label Switched Paths *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Underflow Bandwidth | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/config/specification-type/auto<br><br>/mpls/lsps/constrained-path/tunnel/auto-bandwidth/underflow/config/enabled<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/underflow/config/underflow-threshold<br><br>/mpls/lsps/constrained-path/tunnel/bandwidth/auto-bandwidth/underflowflow/config/trigger-event-count | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* auto-bandwidth adjust-threshold-underflow-limit |

Table 28: RSVP P2P Tunnel

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Destination | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/config/destination | set protocols mpls label-switched-path *name*<br><br>set protocols mpls label-switched-path *name* to *to* |
| Primary Path | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/name | set protocols mpls label-switched-path *name* |
| Primary Path - Locally-Computed | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/path-computation-method/locally-computed<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/use-cspf<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/cspf-tiebreaker/random<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/cspf-tiebreaker/least-fill<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/cspf-tiebreaker/most-fill | set protocols mpls label-switched-path *name* no-cspf<br><br>set protocols mpls label-switched-path *name* random<br><br>set protocols mpls label-switched-path *name* least-fill<br><br>set protocols mpls label-switched-path *name* most-fill |

Table 28: RSVP P2P Tunnel *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Primary Path - Externally Queried | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/path-computation-method/externally-queried | set protocols mpls label-switched-path *name* lsp-external-controller pccd<br><br>set protocols pcep pce *name* destination-ipv4-address *address*<br><br>set protocols pcep pce *name* destination-port 4189 |
| Primary Path - Explicitly Defined | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/path-computation-method/explicitly-defined<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/explicit-path-name | set protocols mpls label-switched-path *name* primary *path* |
| Primary Path - Preference | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/preference | set protocols mpls label-switched-path *name* primary *path* preference *preference* |
| Primary Path - Priorities | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/setup-priority<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/hold-priority | set protocols mpls label-switched-path *name* primary *path* priority *setup reservation* |
| Primary Path - Retry Timer | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/config/retry-timer | set protocols mpls label-switched-path *name* retry-timer |
| Primary Path - Candidate Secondary Paths | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/candidate-secondary-paths | Not supported |
| Primary Path – Admin-Groups | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/admin-groups/config/exclude-group<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/admin-groups/config/include-all-group<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-primary-paths/admin-groups/config/include-any-group | set protocols mpls label-switched-path *name* primary *path* admin-group exclude *group*<br><br>set protocols mpls label-switched-path *name* primary *path* admin-group exclude *group*<br><br>set protocols mpls label-switched-path *name* primary *path* admin-group include-any *group* |
| Secondary Path | /mpls/lsps/constrained-path/tunnel/config/name<br><br>/mpls/lsps/constrained-path/tunnel/config/type/P2P<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/name | set protocols mpls label-switched-path *name* |

Table 28: RSVP P2P Tunnel *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Secondary Path - Locally-Computed | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/path-computation-method/locally-computed<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/use-cspf<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/cspf-tiebreaker/random<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/cspf-tiebreaker/least-fill<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/cspf-tiebreaker/most-fill | set protocols mpls label-switched-path *name* secondary *path name* no-cspf |
| Secondary Path - Externally Queried | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/path-computation-method/externally-queried | Not supported |
| Secondary Path - Explicitly Defined | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/path-computation-method/explicitly-defined<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/explicit-path-name | set protocols mpls label-switched-path *name* secondary *path* |
| Secondary Path - Preference | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/preference | set protocols mpls label-switched-path *name* secondary *path* preference *preference* |
| Secondary Path - Priorities | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/setup-priority<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/hold-priority | set protocols mpls label-switched-path *name* secondary *path* priority *setup reservation* |
| Secondary Path - Retry Timer | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/config/retry-timer | set protocols mpls label-switched-path *name* secondary *path* retry-timer |

Table 28: RSVP P2P Tunnel *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Secondary Path - Admin-Groups | /mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/admin-groups/config/exclude-group<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/admin-groups/config/include-all-group<br><br>/mpls/lsps/constrained-path/tunnel/p2p-tunnel-attributes/p2p-secondary-paths/admin-groups/config/include-any-group | set protocols mpls label-switched-path *name* secondary *path* admin-group exclude *group*<br><br>set protocols mpls label-switched-path *name* secondary *path* admin-group include-all *group*<br><br>set protocols mpls label-switched-path *name* secondary *path* admin-group include-any *group* |

**Related Documentation**

- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig Routing Policy Commands to Junos Configuration on page 47

## Mapping OpenConfig Routing Policy Commands to Junos Configuration

Table 29 on page 47 to Table 31 on page 48 show the mapping of OpenConfig routing policy commands to the relevant configuration in Junos.

Table 29: Defined Set Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Prefix Set | /routing-policy/defined-sets/prefix-set | set policy-options prefix-list *name* |
| Neighbor Set | /routing-policy/defined-sets/neighbor-set | Not supported |
| Tag Set | /routing-policy/defined-sets/tag-set | Not supported |

Table 30: BGP Defined Set Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Community Set | /routing-policy/defined-sets/bgp-defined-sets/community-set | set policy-options community *name* members *value* |
| AS Path Set | /routing-policy/defined-sets/bgp-defined-sets/as-path-set | Not supported |

Table 30: BGP Defined Set Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| Ext Community Set | **/routing-policy/defined-sets/bgp-defined-sets/ext-community-set** | **set policy-options community** ***name*** **members** ***value*** |

Table 31: Policy Definition Configuration

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| | Command path prefix:<br><br>**/routing-policy/policy-definition/statement** | |
| Call Policy | **/conditions/call-policy** | **set policy-options policy-statement** ***name*** **from policy** ***value*** |
| Prefix Set | **/conditions/match-prefix-set/prefix-set** | **set policy-options policy-statement** ***name*** **from prefix-list** ***name***<br><br>**set policy-options policy-statement** ***name*** **from route-filter** ***address*** **prefix-length-range** ***range*** |
| Match Set Options | **/conditions/match-prefix-set/match-set-options** | Not supported |
| Neighbor Set | **/conditions/match-neighbor-set/neighbor-set** | **set policy-options policy-statement** ***name*** **from neighbor** ***address*** |
| Match Neighbor Set | **/conditions/match-neighbor-set/match-set-options** | Not supported |
| Tag Set | **/conditions/match-tag-set/tag-set** | **set policy-options policy-statement** ***name*** **from tag** ***tag*** |
| Match Tag Set | **/conditions/match-tag-set/match-set-options** | Not supported |
| Install Protocol EQ | **/conditions/install-protocol-eq** | **set policy-options policy-statement** ***name*** **from protocol** ***protocol*** |
| IGP Conditions | **/conditions/igp-conditions** | Not supported |
| BGP Match Community Set | **/conditions/bgp-conditions/match-community-set/community-set** | **set policy-options policy-statement** ***name*** **from community** ***name*** |

Table 31: Policy Definition Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| BGP Match Ext Community Set | **/conditions/bgp-conditions/match-ext-community-set** | **set policy-options policy-statement *name* from community *name*** |
| BGP Match Ext Community Set Options | **/conditions/bgp-conditions/match-ext-community-set/match-set-options** | Not supported |
| BGP Match AS Path Set | **/conditions/bgp-conditions/match-as-path-set** | Not supported |
| BGP MED EQ | **/conditions/bgp-conditions/med-eq** | **set policy-options policy-statement *name* from metric *metric*** |
| BGP Origin EQ | **/conditions/bgp-conditions/origin-eq** | **set policy-options policy-statement *name* from origin (egp \| igp \| incomplete)** |
| BGP Next Hop | **/conditions/bgp-conditions/next-hop-in** | **set policy-options policy-statement *name* from next-hop *address*** |
| BGP Local Preference EQ | **/conditions/bgp-conditions/local-pref-eq** | **set policy-options policy-statement *name* from local-preference *preference*** |
| BGP Community Count | **/conditions/bgp-conditions/community-count** | **set policy-options policy-statement *name* from community-count *count* (equal \| orhigher \|orlower)** |
| BGP AS Path Length | **/conditions/bgp-conditions/as-path-length** | Not supported |
| Accept/Reject | **/actions/accept-reject** | **set policy-options policy-statement example-accept then accept**<br><br>**set policy-options policy-statement example-accept then reject** |
| IGP Actions | **/actions/igp-actions/set-tag** | **set policy-options policy-statement *name* then tag *tag*** |
| BGP Actions Set AS Path Prepend | **/actions/bgp-actions/set-as-path-prepend** | Not supported |

Table 31: Policy Definition Configuration *(continued)*

| *Command Name* | *OpenConfig Command Path* | *Junos Configuration* |
|---|---|---|
| BGP Actions Set Community | **/actions/bgp-actions/set-community** | **set policy-options policy-statement *name* then community (set \| replace \| add) *name*** |
| BGP Actions Set Ext Community | **/actions/bgp-actions/set-ext-community** | **set policy-options policy-statement *name* then community (set \| replace \| add) *name*** |
| BGP Actions Set Route Origin | **/actions/bgp-actions/set-route-origin** | **set policy-options policy-statement *name* then origin (egp \|igp \| incomplete)** |
| BGP Actions Set Local Preferences | **/actions/bgp-actions/set-local-pref** | **set policy-options policy-statement *name* then local-preference *preference*** |
| BGP Actions Set Next Hop | **/actions/bgp-actions/set-next-hop** | **set policy-options policy-statement *name* then next-hop *address*** |
| BGP Actions Set Med | **/actions/bgp-actions/set-med** | **set policy-options policy-statement *name* then metric *metric*** |

**Related Documentation**

- Mapping OpenConfig BGP Commands to Junos Configuration on page 21
- Mapping OpenConfig Interface Commands to Junos Configuration on page 30
- Mapping OpenConfig LLDP Commands to Junos Configuration on page 34
- Mapping OpenConfig Local Routing Commands to Junos Configuration on page 35
- Mapping OpenConfig MPLS Commands to Junos Configuration on page 36

CHAPTER 4

# Configuration Statements


- netconf on page 52

## netconf

**Syntax**

```
netconf {
  rfc-compliant;
  ssh {
    connection-limit limit;
    port port;
    rate-limit limit;
  }
  traceoptions {
    file <filename> <files number> <match regular-expression> <size size>
      <world-readable | no-world-readable>;
    flag flag;
    no-remote-trace;
    on-demand;
  }
}
```

**Hierarchy Level** [edit system services]

**Release Information** Statement introduced in Junos OS Release 7.5.

**Description** Configure the NETCONF XML management protocol.

The remaining statements are explained separately.

**Default** If you do not include the **netconf** statement, NETCONF connections are not permitted.

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

**Related Documentation**

- *connection-limit*
- *port (NETCONF)*
- *rate-limit*
- *ssh (NETCONF)*
- *traceoptions (NETCONF and Junos XML Protocol)*