JUNIPER NETWORKS

Junos® OS

Router Advertisement Feature Guide for Subscriber Management

Release
13.2

Published: 2013-07-31

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Junos® OS Router Advertisement Feature Guide for Subscriber Management
13.2

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.

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About the Documentation

Documentation and Release Notes

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

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

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 the *CLI User Guide*.

Documentation Conventions

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

Table 1: Notice Icons

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

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

Table 2: Text and Syntax Conventions

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

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

Convention	Description	Examples
Italic text like this	• Introduces or emphasizes important new terms. • Identifies book names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS System Basics Configuration Guide* • 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: **[edit]** **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. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Enclose optional keywords or variables.	**stub <default-metric** *metric***>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(***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)	Enclose a variable for which you can substitute one or more values.	**community name members [** *community-ids* **]**
Indention and braces ({ })	Identify a level in the configuration hierarchy.	**[edit]** **routing-options {** **static {** **route default {** **nexthop** *address*; **retain;** **}** **}** **}**
; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.
> (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 send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at https://www.juniper.net/cgi-bin/docbugreport/ . If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release 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 JNASC 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: https://www.juniper.net/alerts/

- 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

CHAPTER 1

Router Advertisement in Subscriber Access Networks

Dynamic Router Advertisement and Subscriber Access

Subscriber access supports the configuration of the Router Advertisement Protocol at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level. Statements configured at this hierarchy level are identical in function to those same statements used for static Router Advertisement Protocol configuration, with the exception of the **interface** and **prefix** statements which use dynamic variables.

Related Documentation

- For general information about configuring the Router Advertisement Protocol, see the *Junos OS Routing Protocols Library for Routing Devices*.

PART 2

Configuration

CHAPTER 2

Configuration Overview

Dynamic Router Advertisement Configuration Overview

In a network deployment where router interfaces are configured statically, you might need to configure the Router Advertisement Protocol on only a small number of interfaces on which it might run. However, in a subscriber access network, static configuration of the Router Advertisement Protocol becomes impractical because the number of interfaces that potentially need the Router Advertisement Protocol increases substantially. In addition, deploying services in a dynamic environment requires dynamic modifications to interfaces as they are created.

Subscriber access supports the configuration of the Router Advertisement Protocol at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level. By specifying Router Advertisement Protocol statements within a dynamic profile, you can dynamically apply a Router Advertisement configuration when a subscriber connects to an interface using a particular access technology (for example, DHCP), enabling the subscriber to access a carrier (multicast) network.

To minimally configure the Router Advertisement Protocol requires that you include the **router-advertisement** statement at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level and the **interface** statement along with the ***$junos-interface-name*** dynamic variable. All other statements are optional.

NOTE: Statements used for Router Advertisement Protocol configuration at the **[edit dynamic-profiles *profile-name* protocols]** hierarchy level are identical in function to those same statements used for static Router Advertisement Protocol configuration, with the exception of the **interface** and **prefix** statements, which use dynamic variables.

Related Documentation

- *Dynamic Profiles Overview*
- *Configuring a Dynamic Profile for Client Access*
- *Configuring an Address-Assignment Pool for Router Advertisement*

- For general information about configuring the Router Advertisement Protocol, see the *Junos OS Routing Protocols Library for Routing Devices*.

CHAPTER 3

Configuration Tasks for Dynamic Router Advertisement

Configuring Dynamic Router Advertisement

Configuration for Dynamic Router Advertisement is identical to that performed for static Router Advertisement interfaces, as described in conjunction with configuring Neighbor Discovery, with the exception of their being configured at the **[edit dynamic-profiles *profile-name* protocols router-advertisement]** hierarchy level.

Related Documentation

- For specific Router Advertisement configuration tasks, see the *Junos OS Routing Protocols Library for Routing Devices*

CHAPTER 4

Configuration Statements

[edit dynamic-profiles] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    class-of-service {
      interfaces {
        interface-name {
          unit logical-unit-number {
            classifiers {
              type (classifier-name | default);
            }
            output-traffic-control-profile (profile-name | $junos-cos-traffic-control-profile);
            rewrite-rules {
              dscp (rewrite-name | default);
              dscp-ipv6 (rewrite-name | default);
              ieee-802.1 (rewrite-name | default) vlan-tag (outer | outer-and-inner);
              inet-precedence (rewrite-name | default);
              }
            }
          }
        }
      }
      scheduler-maps {
        map-name {
          forwarding-class class-name scheduler scheduler-name;
        }
      }
      schedulers {
        (scheduler-name) {
          buffer-size (percent percentage | remainder | temporal microseconds |
            $junos-cos-scheduler-bs);
          drop-profile-map loss-priority (any | low | medium-low | medium-high | high)
            protocol (any | non-tcp | tcp) drop-profile (profile-name | predefined-variable);
          excess-priority (low | high | $junos-cos-scheduler-excess-priority);
          excess-rate (percent percentage  | percent $junos-cos-scheduler-excess-rate);
          overhead-accounting (shaping-mode) <bytes (byte-value>;
          priority (priority-level | $junos-cos-scheduler-priority);
          shaping-rate (rate | predefined-variable);
```

```
        transmit-rate (rate | percent percentage | remainder | percent percentage
          $junos-cos-scheduler-tx) <exact | rate-limit>;
      }
    }
    traffic-control-profiles profile-name {
      delay-buffer-rate (percent percentage | rate);
      excess-rate (percent percentage | proportion value | percent
        $junos-cos-excess-rate);
      guaranteed-rate (percent percentage | rate);
      overhead-accounting (shaping-mode) <bytes (byte-value>;
      scheduler-map map-name;
      shaping-rate (percent percentage | rate | predefined-variable);
    }
  }
  firewall {
    family family {
      fast-update-filter filter-name {
        interface-specific;
      match-order [match-order];
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        only-at-create;
      filter filter-name {
      interface-specific;
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        }
    policer policer-name {
      filter-specific;
      if-exceeding {
        (bandwidth-limit bps | bandwidth-percent percentage);
        burst-size-limit bytes;
      }
      logical-bandwidth-policer;
      logical-interface-policer;
      physical-interface-policer;
      then {
        policer-action;
      }
    }
    hierarchical-policer policer-name {
      aggregate {
        if-exceeding {
          bandwidth-limit-limit bps;
```

```
            burst-size-limit bytes;
          }
          then {
            policer-action;
          }
        }
        premium {
          if-exceeding {
            bandwidth-limit bps;
            burst-size-limit bytes;
          }
          then {
            policer-action;
          }
        }
      }
      three-color-policer policer-name {
        action {
          loss-priority high then discard;
        }
        logical-interface-policer;
        single-rate {
          (color-aware | color-blind);
          committed-burst-size bytes;
          committed-information-rate bps;
          excess-burst-size bytes;
        }
        two-rate {
          (color-aware | color-blind);
          committed-burst-size bytes;
          committed-information-rate bps;
          peak-burst-size bytes;
          peak-information-rate bps;
          }
        }
      }
}
policy-options {
  prefix-listname {
    ip-addresses;
  }
}
interfaces {
  interface-name {
    unit logical-unit-number {
      family family {
        access-concentrator name;
        address address;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
          adf {
            counter;
            input-precedence precedence;
            not-mandatory;
            output-precedence precedence;
```

```
            rule rule-value;
          }
          input filter-name {
            precedence precedence;
            shared-name filter-shared-name;
          }
          output filter-name {
            precedence precedence;
            shared-name filter-shared-name;
          }
        }
        max-sessions number;
        max-sessions-vsa-ignore;
        rpf-check {
          fail-filter filter-name;
          mode loose;
        }
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
          output {
            service-set service-set-name {
              service-filter filter-name;
            }
          }
        }
        service-name-table table-name;
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
      }
      ppp-options {
        chap;
        pap;
      }
      vlan-id number;
    }
    vlan-tagging;
  }
  interface-set interface-set-name {
    interface interface-name {
      unit logical-unit-number;
    }
  }
  demux0 {
    unit logical-unit-number {
      demux-options {
        underlying-interface interface-name
      }
      demux-source {
        source-prefix;
      }
```

```
      family family {
        access-concentrator name;
        address address;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
          input filter-name;
          output filter-name;
        }
        mac-validate (loose | strict):
        max-sessions number;
        max-sessions-vsa-ignore;
        service-name-table table-name;
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
      }
    }
  }
  pp0 {
    unit logical-unit-number {
      keepalives interval seconds;
      no-keepalives;
      pppoe-options {
        underlying-interface interface-name;
        server;
      }
      ppp-options {
        authentication [ authentication-protocols ];
        chap {
          challenge-length minimum minimum-length maximum maximum-length;
        }
        pap;
      }
      family inet {
        unnumbered-address interface-name;
        address address;
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
          output {
            service-set service-set-name {
              service-filter filter-name;
            }
          }
        }
        filter {
          input filter-name {
            precedence precedence;
          }
          output filter-name {
            precedence precedence;
```

```
            }
          }
        }
      }
    }
}
protocols {
    igmp {
        interface interface-name {
            accounting;
            disable;
            group-policy;
            immediate-leave
            no-accounting;
            promiscuous-mode;
            ssm-map ssm-map-name;
            static {
                group group {
                    source source;
                }
            }
            version version;
        }
        mld {
            interface interface-name {
                disable;
                (accounting | no-accounting);
                group-policy;
                immediate-leave;
                oif-map;
                passive;
                ssm-map ssm-map-name;
                static {
                    group multicast-group-address {
                        exclude;
                        group-count number;
                        group-increment increment;
                        source ip-address {
                            source-count number;
                            source-increment increment;
                        }
                    }
                }
                version version;
            }
        }
        router-advertisement {
            interface interface-name {
                current-hop-limit number;
                default-lifetime seconds;
                (managed-configuration | no-managed-configuration);
                max-advertisement-interval seconds;
                min-advertisement-interval seconds;
                (other-stateful-configuration | no-other-stateful-configuration);
                prefix prefix {
                    (autonomous | no-autonomous);
```

```
                (on-link | no-on-link);
                preferred-lifetime seconds;
                valid-lifetime seconds;
              }
              reachable-time milliseconds;
              retransmit-timer milliseconds;
            }
          }
        }
      }
    }
    routing-instances routing-instance-name {
      interface interface-name;
      routing-options {
        access {
          route prefix {
            next-hop next-hop;
            metric route-cost;
            preference route-distance;
            tag route-tag;
          }
        }
        access-internal {
          route subscriber-ip-address {
            qualified-next-hop underlying-interface {
              mac-address address;
            }
          }
        }
        multicast {
          interface interface-name {
            no-qos-adjust;
          }
        }
      }
      rib routing-table-name {
        access {
          route prefix {
            next-hop next-hop;
            metric route-cost;
            preference route-distance;
            tag route-tag;
          }
        }
        access-internal {
          route subscriber-ip-address {
            qualified-next-hop underlying-interface {
              mac-address address;
            }
          }
        }
      }
    }
    routing-options {
      access {
        route prefix {
```

```
            next-hop next-hop;
            metric route-cost;
            preference route-distance;
            tag route-tag;
          }
        }
        access-internal {
          route subscriber-ip-address {
            qualified-next-hop underlying-interface {
              mac-address address;
            }
          }
        }
        multicast {
          interface interface-name {
            no-qos-adjust;
          }
        }
      }
      variables {
        variable-name {
          default-value default-value;
          equals expression;
          mandatory;
          radius {
            vendor-id id {
              attribute attribute-number;
              tag tag-number;
            }
            redirect-url
          }
          uid;
          uid-reference;
        }
      }
    }
```

Related Documentation

- *Dynamic Profiles Overview*
- *CoS for Subscriber Access Overview*
- *Configuring a Basic Dynamic Profile*
- *Configuring Static Hierarchical Scheduling and Queuing in a Dynamic Profile for Subscriber Access*
- *Two-Color Policer Configuration Overview*
- *Three-Color Policer Configuration Overview*
- *Hierarchical Policer Configuration Overview*
- *Guidelines for Applying Traffic Policers*

autonomous (Dynamic Router Advertisement)

Syntax (autonomous | no-autonomous);

Hierarchy Level [edit dynamic-profiles *profile-name* protocols router-advertisement interface *interface-name* prefix *prefix*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify whether prefixes in the router advertisement messages are used for stateless address autoconfiguration:

- **autonomous**—Use prefixes for address autoconfiguration.
- **no-autonomous**—Do not use prefixes for address autoconfiguration.

Default autonomous

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

current-hop-limit (Dynamic Router Advertisement)

Syntax current-hop-limit *number*;

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Default value placed in the hop count field of the IP header for outgoing packets.

Options ***number***—Hop limit. A value of 0 means the limit is unspecified by this router.
Range: 0 through 255
Default: 64

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

default-lifetime (Dynamic Router Advertisement)

Syntax default-lifetime *seconds*;

Hierarchy Level [edit protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Lifetime associated with a default router.

Options ***seconds***—Default lifetime. A value of 0 means this router is not the default router.
Range: Maximum advertisement interval value through 9000 seconds
Default: Three times the maximum advertisement interval value

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

Related Documentation
- *max-advertisement-interval (Protocols IPv6 Neighbor Discovery)*
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

interface (Dynamic Router Advertisement)

Syntax

```
interface interface-name {
  current-hop-limitnumber;
  default-lifetime seconds;
  (managed-configuration | no-managed-configuration);
  max-advertisement-interval seconds;
  min-advertisement-interval seconds;
  (other-stateful-configuration | no-other-stateful-configuration);
  prefixprefix {
    (autonomous | no-autonomous);
    (on-link | no-on-link);
    preferred-lifetime seconds;
    valid-lifetime seconds;
  }
  reachable-time milliseconds;
  retransmit-timer milliseconds;
}
```

Hierarchy Level [edit dynamic-profiles protocols router-advertisement]

Release Information Statement introduced in Junos OS Release 10.1.

Description Dynamically configure router advertisement properties on an interface. To dynamically configure interface properties, include the ***$junos-interface-name*** dynamic variable for the interface name.

Options ***interface-name***—Name of an interface. Specify the ***$junos-interface-name*** dynamic variable or the full, static interface name, including the physical and logical address components.

NOTE: Even though you can specify the static interface name when defining the interface, we recommend using dynamic variable when configuring this statement.

The remaining statements are explained separately.

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

Related Documentation

- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

managed-configuration (Dynamic Router Advertisement)

Syntax (managed-configuration | no-managed-configuration);

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify whether to enable the dynamic host to use a stateful autoconfiguration protocol for address autoconfiguration, along with any stateless autoconfiguration already configured:

- **managed-configuration**—Enable host to use stateful autoconfiguration.
- **no-managed-configuration**—Disable host from using stateful autoconfiguration.

Default The configured object is disabled unless explicitly enabled.

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

max-advertisement-interval (Dynamic Router Advertisement)

Syntax max-advertisement-interval *seconds*;

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Maximum interval between each router advertisement message.

Options ***seconds***—Maximum interval.
Range: 4 through 1800 seconds
Default: 600 seconds

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

Related Documentation
- *min-advertisement-interval (Protocols IPv6 Neighbor Discovery)*
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

min-advertisement-interval (Dynamic Router Advertisement)

Syntax min-advertisement-interval *seconds*;

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Minimum interval between each router advertisement message.

Options ***seconds***—Minimum interval.

Range: 3 seconds through three-quarter times the maximum advertisement interval value

Default: One-third the maximum advertisement interval value

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

Related Documentation

- *max-advertisement-interval (Protocols IPv6 Neighbor Discovery)*
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

on-link (Dynamic Router Advertisement)

Syntax (on-link | no-on-link);

Hierarchy Level [edit dynamic-profiles *profile-name* protocols router-advertisement interface *interface-name*prefix *prefix*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify whether to enable prefixes to be used for onlink determination:

- **no-on-link**—Disable prefixes from being used for onlink determination.
- **on-link**—Enable prefixes to be used for onlink determination.

Default The configured object is enabled unless explicitly disabled.

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

Related Documentation

- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

other-stateful-configuration (Dynamic Router Advertisement)

Syntax (other-stateful-configuration | no-other-stateful-configuration);

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify whether to enable autoconfiguration of other nonaddress-related information:

- **no-other-stateful-configuration**—Disable autoconfiguration of other nonaddress-related information.
- **other-stateful-configuration**—Enable autoconfiguration of other nonaddress-related information.

Default The configured object is disabled unless explicitly enabled.

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

preferred-lifetime (Dynamic Router Advertisement)

Syntax preferred-lifetime *seconds*;

Hierarchy Level [edit dynamic-profiles *profile-name* protocols router-advertisement interface *interface-name*prefix *prefix*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify how long the prefix generated by stateless autoconfiguration remains preferred.

Options ***seconds***—Preferred lifetime, in seconds. If you set the preferred lifetime to **0xffffffff**, the lifetime is infinite. The preferred lifetime is never greater than the valid lifetime.

Default: 604,800 seconds

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

Related Documentation
- *valid-lifetime*
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

prefix (Dynamic Router Advertisement)

Syntax

```
prefix prefix {
  (autonomous | no-autonomous);
  (on-link | no-on-link);
  preferred-lifetime seconds;
  valid-lifetime seconds;
}
```

Hierarchy Level [edit dynamic-profiles protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Configure the prefix name in router advertisement messages.

Options ***prefix***—Prefix name. For dynamic configuration, specify the ***$junos-ipv6–ndra-prefix*** dynamic variable.

The remaining statements are explained separately.

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

Related Documentation

- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

protocols (Dynamic Profiles)

Syntax

```
protocols {
  igmp {
    interface interface-name {
      accounting;
      disable;
      group-policy;
      immediate-leave
      no-accounting;
      promiscuous-mode;
      ssm-map ssm-map-name;
      static {
        group group {
          source source;
        }
      }
      version version;
    }
    mld {
      interfaceinterface-name {
        disable;
        (accounting | no-accounting);
        group-policy;
        immediate-leave;
        oif-map;
        passive;
        ssm-map ssm-map-name;
        static {
          group multicast-group-address {
            exclude;
            group-count number;
            group-increment increment;
            source ip-address {
              source-count number;
              source-increment increment;
            }
          }
        }
        version version;
      }
    }
    router-advertisement {
      interfaceinterface-name {
        current-hop-limitnumber;
        default-lifetime seconds;
        (managed-configuration | no-managed-configuration);
        max-advertisement-interval seconds;
        min-advertisement-interval seconds;
        (other-stateful-configuration | no-other-stateful-configuration);
        prefix prefix;
        reachable-time milliseconds;
        retransmit-timer milliseconds;
      }
```

```
    }
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name*]

Release Information Statement introduced in Junos OS Release 9.2.
Support at the **[edit dynamic-profiles *profile-name* protocols mld]** and **[edit dynamic-profiles *profile-name* protocols router-advertisement]** hierarchy levels introduced in Junos OS Release 10.1.

Description Enable IGMP on the router. IGMP must be enabled for the router to receive multicast packets.

Default IGMP is disabled on the router. IGMP is automatically enabled on all broadcast interfaces when you configure Protocol Independent Multicast (PIM) or Distance Vector Multicast Routing Protocol (DVMRP).

The statements are explained separately.

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

Related Documentation
- For general information about configuring IGMP or MLD, see the *Multicast Protocols Feature Guide for Routing Devices*.

reachable-time (Dynamic Router Advertisement)

Syntax reachable-time *milliseconds*;

Hierarchy Level [edit protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Set the length of time that a node considers a neighbor reachable until another reachability confirmation is received from that neighbor.

Options ***milliseconds***—Reachability time limit.
Range: 0 through 3,600,000 milliseconds
Default: 0 milliseconds

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

retransmit-timer (Dynamic Router Advertisement)

Syntax retransmit-timer *milliseconds*;

Hierarchy Level [edit protocols router-advertisement interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Set the retransmission frequency of neighbor solicitation messages.

Options ***milliseconds***—Retransmission frequency.
Default: 0 milliseconds

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

router-advertisement (Dynamic Profiles)

Syntax router-advertisement {...}

Hierarchy Level [edit dynamic-profiles protocols]

Release Information Statement introduced in Junos OS Release 10.1.

Description Enable router advertisement.

The remaining statements are explained separately.

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

Related Documentation
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

valid-lifetime (Dynamic Router Advertisement)

Syntax valid-lifetime *seconds*;

Hierarchy Level [edit dynamic-profiles *profile-name* protocols router-advertisement interface *interface-name* prefix *prefix*]

Release Information Statement introduced in Junos OS Release 10.1.

Description Specify how long the prefix remains valid for onlink determination.

Options ***seconds***—Valid lifetime, in seconds. If you set the valid lifetime to **0xffffffff**, the lifetime is infinite.

Default: 2,592,000 seconds

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

Related Documentation

- *preferred-lifetime*
- *Example: Configuring IPv6 Interfaces and Enabling Neighbor Discovery*

PART 3

Administration

CHAPTER 5

Monitoring Commands

clear ipv6 router-advertisement

Syntax clear ipv6 router-advertisement
<interface *interface*>
<logical-system (all | *logical-system-name*)>

Release Information Command introduced before Junos OS Release 7.4.

Description Clear IPv6 router advertisement counters.

Options **none**—Clear IPv6 router advertisement counters for all interfaces.

interface *interface*—(Optional) Clear IPv6 router advertisement counters for the specified interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

Required Privilege Level view

Related Documentation
- show ipv6 router-advertisement on page 35

List of Sample Output clear ipv6 router-advertisement on page 34

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

Sample Output

clear ipv6 router-advertisement

```
user@host> clear ipv6 router-advertisement
```

show ipv6 router-advertisement

Syntax

show ipv6 router-advertisement
<conflicts>
<interface *interface*>
<logical-system (all | *logical-system-name*)>
<prefix *prefix/prefix length*>

Release Information

Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 12.2 for the QFX Series.

Description

Display information about IPv6 router advertisements, including statistics about messages sent and received on interfaces, and information received from advertisements from other routers.

Options

none—Display all IPv6 router advertisement information for all interfaces.

conflicts—(Optional) Display only the IPv6 router advertisement information that is conflicting.

interface *interface*—(Optional) Display IPv6 router advertisement information for the specified interface.

logical-system (all | *logical-system-name*)—(Optional) Perform this operation on all logical systems or on a particular logical system.

prefix *prefix/prefix length*—(Optional) Display IPv6 router advertisement information for the specified prefix.

Additional Information

The display identifies conflicting information by enclosing the value the router is advertising in brackets.

Required Privilege Level

view

Related Documentation

- clear ipv6 router-advertisement on page 34

List of Sample Output

show ipv6 router-advertisement on page 36
show ipv6 router-advertisement conflicts on page 37
show ipv6 router-advertisement prefix on page 37

Output Fields

Table 3 on page 35 describes the output fields for the **show ipv6 router-advertisement** command. Output fields are listed in the approximate order in which they appear.

Table 3: show ipv6 router-advertisement Output Fields

Field Name	Field Description
Interface	Name of the interface.
Advertisements sent	Number of router advertisements sent and the elapsed time since they were sent.

Table 3: show ipv6 router-advertisement Output Fields *(continued)*

Field Name	Field Description
Solicits received	Number of solicitation messages received.
Advertisements received	Number of router advertisements received.
Advertisements from	Names of interfaces from which router advertisements have been received and the elapsed time since the last one was received.
Managed	Managed address configuration flag: **0** (stateless) or **1** (stateful).
Other configuration	Other stateful configuration flag: **0** (stateless) or **1** (stateful).
Reachable time	Time that a node identifies a neighbor as reachable after receiving a reachability confirmation, in milliseconds.
Default lifetime	Default lifetime, in seconds: from 0 seconds to 18.2 hours. A setting of 0 indicates that the router is not a default router.
Retransmit timer	Time between retransmitted Neighbor Solicitation messages, in milliseconds.
Current hop limit	Configured current hop limit.
Prefix	Name and length of the prefix.
Valid lifetime	How long the prefix remains valid for onlink determination.
Preferred lifetime	How long the prefix generated by stateless autoconfiguration remains preferred.
On link	Onlink flag: **0** (not onlink) or **1** (onlink).
Autonomous	Autonomous address configuration flag: **0** (not autonomous) or **1** (autonomous).

Sample Output

show ipv6 router-advertisement

```
user@host> show ipv6 router-advertisement
Interface: fe-0/1/1.0
  Advertisements sent: 0
  Solicits received: 0
  Advertisements received: 0
Interface: fxp0.0
  Advertisements sent: 0
  Solicits received: 0
  Advertisements received: 1
  Advertisement from fe80::2d0:b7ff:fe1e:7b0e, heard 00:00:13 ago
    Managed: 0
    Other configuration: 0 [1]
      Reachable time: 0 ms
      Default lifetime: 1800 sec
```

```
    Retransmit timer: 0 ms
    Current hop limit: 64
```

show ipv6 router-advertisement conflicts

```
user@host> show ipv6 router-advertisement conflicts
Interface: fxp0.0
  Advertisement from fe80::2d0:b7ff:fe1e:7b0e, heard 00:01:08 ago
    Other configuration: 0 [1]
```

show ipv6 router-advertisement prefix

```
user@host> show ipv6 router-advertisement prefix 8040::/16
Interface: fe-0/1/3.0
  Advertisements sent: 3, last sent 00:04:11 ago
  Solicits received: 0
  Advertisements received: 3
  Advertisement from fe80::290:69ff:fe9a:5403, heard 00:00:05 ago
    Managed: 0
    Other configuration: 0
    Reachable time: 0 ms
    Default lifetime: 180 sec [1800 sec]
    Retransmit timer: 0 ms
    Current hop limit: 64
    Prefix: 8040:1::/64
      Valid lifetime: 2592000 sec
      Preferred lifetime: 604800 sec
      On link: 1
      Autonomous: 1
```


PART 4

Troubleshooting

CHAPTER 6

Acquiring Troubleshooting Information

Collecting Subscriber Access Logs Before Contacting Juniper Technical Support

Problem When you experience a subscriber access problem in your network, we recommend that you collect certain logs before you contact Juniper Technical Support. This topic shows you the most useful logs for a variety of network implementations. In addition to the relevant log information, you must also collect standard troubleshooting information and send it to Juniper Technical Support in your request for assistance.

Solution To collect standard troubleshooting information:

- Redirect the command output to a file.

  user@host> **request support information | save rsi-1**

To configure logging to assist Juniper Technical Support:

1. Review the following blocks of statements to determine which apply to your configuration.

   ```
   [edit]
   set system syslog archive size 100m files 25
   set system auto-configuration traceoptions file filename
   set system auto-configuration traceoptions file filename size 100m files 25
   set protocols ppp-service traceoptions file filename size 100m files 25
   set protocols ppp-service traceoptions level all
   set protocols ppp-service traceoptions flag all
   set protocols ppp traceoptions file filename size 100m files 25
   set protocols ppp traceoptions level all
   set protocols ppp traceoptions flag all
   set protocols ppp monitor-session all
   set interfaces pp0 traceoptions flag all
   set demux traceoptions file filename size 100m files 25
   set demux traceoptions level all
   set demux traceoptions flag all
   set system processes dhcp-service traceoptions file filename
   set system processes dhcp-service traceoptions file size 100m
   set system processes dhcp-service traceoptions file files 25
   set system processes dhcp-service traceoptions flag all
   set class-of-service traceoptions file filename
   set class-of-service traceoptions file size 100m
   set class-of-service traceoptions flag all
   set class-of-service traceoptions file files 25
   set routing-options traceoptions file filename
   set routing-options traceoptions file size 100m
   set routing-options traceoptions flag all
   set routing-options traceoptions file files 25
   set interfaces traceoptions file filename
   set interfaces traceoptions file size 100m
   set interfaces traceoptions flag all
   set interfaces traceoptions file files 25
   set system processes general-authentication-service traceoptions file filename
   set system processes general-authentication-service traceoptions file size 100m
   set system processes general-authentication-service traceoptions flag all
   set system processes general-authentication-service traceoptions file files 25
   ```

2. Copy the relevant statements into a text file and modify the log filenames as you want.
3. Copy the statements from the text file and paste them into the CLI on your router to configure logging.
4. Commit the logging configuration to begin collecting information.

NOTE: The maximum file size for DHCP local server and DHCP relay log files is 1 GB. The maximum number of log files for DHCP local server and DHCP relay is 1000.

BEST PRACTICE: Enable these logs only to collect information when troubleshooting specific problems. Enabling these logs during normal operations can result in reduced system performance.

Related Documentation

- *Compressing Troubleshooting Logs from /var/logs to Send to Juniper Technical Support*

PART 5

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