

# Junos® OS

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## Layer 2 Network Access Protocols User Guide

Published  
2023-03-14

Juniper Networks, Inc.  
1133 Innovation Way  
Sunnyvale, California 94089  
USA  
408-745-2000  
[www.juniper.net](http://www.juniper.net)

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# About This Guide

Use this guide to configure common Layer 2 protocols.

## RELATED DOCUMENTATION

| [Junos OS Portable Libraries](#)

# 1

CHAPTER

## Overview

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# Network Access Overview

Junos OS enables you to configure network access features for the device at the [edit access] hierarchy level. Network access features include Layer 2 Tunneling Protocol (*L2TP*), Point-to-Point Protocol (*PPP*), and *Subscriber Access* configuration. PPP is an encapsulation protocol for transporting IP traffic across point-to-point links. L2TP allows PPP to be tunneled within a network.

For information about configuring Subscriber Access, see [Broadband Subscriber Sessions User Guide](#). For information about multilink PPP (MLPPP), see [Link and Multilink Services Interfaces User Guide for Routing Devices](#).

# 2

CHAPTER

## Configuring PPP and L2TP

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# Point-to-Point Protocol (PPP)

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Point-to-Point Protocol (PPP) is a Layer 2 communications protocol. PPP encapsulates multiprotocol data over point-to-point links. PPP encapsulation is the default encapsulation type for physical interfaces.

To configure PPP for subscriber access, see *PPP Subscriber Access Networks Overview*.

## Benefits of PPP

- Flexible
- Built-in testing of the link to reduce packet loss
- Can encapsulate multiple protocols simultaneously on the same link

## Limitations of PPP

- IP class of service (CoS) is not supported on PPP interfaces. All the traffic is sent to the best effort queue (queue 0) and CoS code points are not processed.
- Fixed classifiers are not supported.
- The MPLS family is not supported on logical interfaces if you configured PPP encapsulation on the interface.
- The circuit cross-connect (CCC) version of PPP (configured with the `ppp-ccc` option) and the translational cross-connect (TCC) version of PPP (`ppp-tcc` option) are not supported for configuration with the `encapsulation` statement.

## Supported PPP Interface Standards

Junos OS substantially supports the following RFCs, which define standards for PPP interfaces.

- RFC 1332, *The PPP Internet Protocol Control Protocol (IPCP)*
- RFC 1334, *PPP Authentication Protocols*
- RFC 1661, *The Point-to-Point Protocol (PPP)*

## PPP Configuration

### IN THIS SECTION

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## Configure PPP Encapsulation

To configure PPP encapsulation on a physical interface:

1. In configuration mode, go to the `[edit interfaces interface-name]` hierarchy level.

```
[edit]
user@device# edit interfaces interface-name
```

2. To enable PPP encapsulation, include the `encapsulation ppp` statement.

```
[edit interfaces interface-name]
user@device# set encapsulation ppp
```

3. (Optional) Configure PPP-specific interface properties by including the `ppp-options` statement. Details of these options are explained in later sections.

```
[edit interfaces interface-name]
user@device# set ppp-options
```

You can use the following operational mode commands to view the PPP configuration and statistical details:

- `show ppp address-pool` displays PPP address pool information.
- `show ppp interface` displays PPP session information for an interface.
- `show ppp statistics` displays PPP session statistics.
- `show ppp summary` displays summary information about PPP-configured interfaces.
- `show interfaces e1-fpc/pic/port`, `show interfaces t1-fpc/pic/port`, and `show interfaces ds-fpc/pic/port` display the PPP settings of a specific E1, T1, or DS interface, respectively.

## SEE ALSO

| [encapsulation](#)

## Example: PPP Encapsulation

Use this example to configure PPP encapsulation on a SONET/SDH interface. The second and third family statements allow IS-IS and MPLS to run on the interface.

```
[edit interfaces]
so-7/0/0 {
  encapsulation ppp;
  unit 0 {
    point-to-point;
    family inet {
      address 192.168.1.113/32 {
        destination 192.168.1.114;
      }
    }
    family iso;
    family mpls;
```

```
}
}
```

## Configure LCP

PPP uses the Link Control Protocol (LCP) to establish and test a link before transmitting data. LCP can negotiate optional configurations for the link with the other device such as the method used to authenticate the link. To establish and test the link, LCP sends different types of packets to the peer device.

1. In configuration mode, go to the correct hierarchy.

```
[edit]
user@device# edit interfaces interface-name unit number ppp-options
```

2. The first packet LCP sends is the Configure-Request packet, which is a request to configure the link. The device sends LCP Configure-Requests until it receives a response or reaches the specified maximum number. By default, the device sends a maximum of 254 Configure-Request packets. To configure a different maximum number of LCP Configure-Request packets:

```
[edit interfaces interface-name unit number ppp-options]
user@device# set lcp-max-conf-req number
```

The *number* range is from 0 to 65,535. If you configure the maximum to be 0, there is no limit and the device sends LCP Configure-Requests indefinitely.

3. LCP uses a restart timer to protect against packet loss. The timer starts when LCP sends a packet. When the restart timer expires, the device resends the packet. You can configure the LCP restart timer on interfaces with PPP, PPP TCC, PPP over Ethernet, PPP over ATM, and PPP over Frame Relay encapsulations. By default, the restart time expires after 3 seconds. To change the restart timer expiration time, include the `lcp-restart-timer` statement and specify the number of milliseconds.

```
[edit interfaces interface-name unit number ppp-options]
user@device# set lcp-restart-timer milliseconds
```

You can also configure this statement at the `[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options]` hierarchy level.

## SEE ALSO

| [\*lcp-max-conf-req\*](#)



| *lcp-restart-timer*

## Configure NCP

After LCP has established a link, PPP uses the Network Control Protocol (NCP) to configure Layer 3 protocols. PPP can use multiple Layer 3 protocols simultaneously. To configure NCP:

1. In configuration mode, go to the correct hierarchy.

```
[edit]
user@device# edit interfaces interface-name unit number ppp-options
```

2. The first packet NCP sends is the Configure-Request packet, which is a request to configure the link. The device sends NCP Configure-Request packets until it receives a response or reaches the specified maximum number. By default, the device sends a maximum of 254 Configure-Request packets. To configure a different maximum number of LCP Configure-Request packets:

```
[edit interfaces interface-name unit number ppp-options]
user@device# set ncp-max-conf-req number
```

The *number* range is from 0 to 65,535. If you configure the maximum to be 0, there is no limit and the device sends LCP Configure-Requests indefinitely.

3. NCP uses a restart timer to protect against packet loss. The timer starts when NCP sends a packet. When the restart timer expires, the device resends the packet. You can configure the NCP restart timer on interfaces with PPP and PPP TCC encapsulations and on multilink PPP bundle interfaces. By default, the restart time expires after 3 seconds. To change the restart timer expiration time, include the `ncp-restart-timer` statement and specify the number of milliseconds.

```
[edit interfaces interface-name unit number ppp-options]
user@device# set ncp-restart-timer milliseconds
```

You can also configure this statement at the `[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options]` hierarchy level.

## SEE ALSO

| *ncp-max-conf-req*

| *ncp-restart-timer*

## PPP Clear Loop Detected Timer for LCP

When a PPP session detects a loop, the operating system sets the loop detected flag. If the protocol doesn't clear the flag after it clears the loopback, the clear loop detected timer clears the flag after the specified time has elapsed.

To configure the clear loop detected timer for the LCP component of a PPP session, include the `loopback-clear-timer` statement and specify the number of seconds.

```
[edit interfaces interface-name unit logical-unit-number ppp-options]
user@device# set loopback-clear-timer seconds
```

You can also include this statement at the `[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-options]` hierarchy level.

To monitor the configuration, issue the `show interfaces interface-name extensive` command.

## Verify the LCP and NCP Configuration

To monitor the LCP and NCP configuration, issue the `show interfaces interface-name` command. The operating system displays the configured options in the PPP parameters field for the physical interface.

```
user@host> run show interfaces t1-0/0/0:1:1.0 detail
Logical interface t1-0/0/0:1:1.0 (Index 67) (SNMP ifIndex 40)
(Generation 156)
Flags: Hardware-Down Device-Down Point-To-Point SNMP-Traps 0x4000
Encapsulation: PPP
PPP parameters:
  LCP restart timer: 2000 msec
  NCP restart timer: 2000 msec
Protocol inet, MTU: 1500, Generation: 163, Route table: 0
Flags: Protocol-Down
Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
  Destination: 198.51.100/24, Local: 198.51.100.2, Broadcast: 198.51.100.255,
```

## PPP Profiles

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- [Client-Specific Profile | 11](#)
- [Group Profiles | 13](#)

When multiple types of profiles are configured, the operating system only implements one configuration. The operating system prioritizes them as follows, where `[edit access profile profile-name]` overrides all other profile configurations:

1. `[edit access profile profile-name]`
2. `[edit access group-profile profile-name]`
3. `[edit access profile profile-name user-group-profile profile-name]`

**NOTE:** When you configure a profile, you can configure either L2TP or PPP parameters, but not both at the same time.

### Access Profiles

To validate PPP connections and session requests, set up access profiles by configuring the profile statement at the `[edit access]` hierarchy level. You can configure multiple profiles. You can also configure multiple clients for each profile.

1. To configure the access profile, include the profile statement at the `[edit access]` hierarchy level and assign a name to the profile.

```
[edit access]
user@device# set profile profile-name
```

2. You can configure the order in which the operating system tries different methods to authenticate peers. For each access attempt, the software tries the authentication methods in order, from first to

last. Configure the authentication order using the `authentication-order` statement. If you do not include the `authentication-order` statement, the operating system verifies clients using password authentication.

```
[edit access profile profile-name]
user@device# set authentication-order [ authentication-methods ]
```

In *authentication-methods*, specify one or more of the following in the preferred order, from first tried to last tried:

- `radius`—Verify the client using RADIUS authentication services.
- `password`—Verify the client using the information configured at the `[edit access profile profile-name client client-name]` hierarchy level.

## SEE ALSO

| [profile](#)

## Client-Specific Profile

To define PPP properties for a client-specific access profile, include one or more of the following statements at the `[edit access profile profile-name client client-name ppp]` hierarchy level.

**NOTE:** The properties defined in the profile take precedence over the values defined in the group profile.

```
[edit access profile profile-name]
client client-name {
  chap-secret chap-secret;
  group-profile profile-name;
  pap-password pap-password;
  ppp {
    cell-overhead;
    encapsulation-overhead bytes;
    framed-ip-address;
    framed-pool framed-pool;
    idle-timeout seconds;
    interface-id interface-id;
    keepalive seconds;
    primary-dns primary-dns;
```

```

        primary-wins primary-wins;
        secondary-dns secondary-dns;
        secondary-wins secondary-wins;
    }
}

```

The `cell-overhead` statement configures the session to use ATM-aware egress shaping on the IQ2 PIC.

*bytes* (in the `encapsulation-overhead` statement) configures the number of bytes used as overhead for class-of-service calculations.

*ip-address* (in the `framed-ip-address` statement) is the IPv4 prefix.

*pool-id* (in the `framed-pool` statement) is a configured address pool.

*seconds* (in the `idle-timeout` statement) is the number of seconds a user can remain idle before the session is terminated. By default, idle timeout is set to 0. You can configure this to be a value in the range from 0 through 4,294,967,295.

*interface-id* (in the `interface-id` statement) is the identifier for the interface representing an L2TP session configured at the [edit interfaces *interface-name* unit *local-unit-number* dial-options] hierarchy level.

`keepalive seconds` is the time period that must elapse before the Junos OS checks the status of the PPP session by sending an echo request to the peer. For each session, Junos OS sends a maximum of ten keepalives at 10-second intervals and the session is closed if there is no response. By default, the time to send a *keepalive* messages is set to 10 seconds. You can configure this to be a value in the range from 0 through 32,767 seconds.

`keepalive-retries number-of-retries` is the number of retry attempts for checking the keepalive status of a Point-to-Point (PPP) protocol session. Configuring a lower number of retries helps reduce the detection time for PPP client session failures or timeouts if you have configured a *keepalive seconds* value. By default, the number of retries is set to 10 times. You can configure this to be a value in the range from 3 through 32,767 times.

*primary-dns* (in the `primary-dns` statement) is an IPv4 address.

*secondary-dns* (in the `secondary-dns` statement) is an IPv4 address.

*primary-wins* (in the `primary-wins` statement) is an IPv4 address.

*secondary-wins* (in the `secondary-wins` statement) is an IPv4 address.

When you configure PPP properties for a profile, you typically configure the `chap-secret` statement or `pap-password` statement.

## Group Profiles

### IN THIS SECTION

- [Configure PPP for a Group Profile | 13](#)
- [Apply a PPP Group Profile to a Tunnel | 14](#)

If you need to apply PPP to multiple devices, you might want to configure group profile to define the PPP attributes. Any client referencing the configured group profile inherits all the group profile attributes. This makes it easier to apply PPP on a larger scale.

### Configure PPP for a Group Profile

To configure the PPP attributes for a group profile, include the following statements at the [edit access group-profile *profile-name* ppp] hierarchy level:

```
[edit access group-profile profile-name ppp]
cell-overhead;
encapsulation-overhead bytes;
framed-pool pool-id;
idle-timeout seconds;
interface-id interface-id;
keepalive seconds;
ppp-options {
    aaa-options aaa-options-name;
    chap;
    ignore-magic-number-mismatch;
    initiate-ncp (ip | ipv6 | dual-stack-passive)
    ipcp-suggest-dns-option;
    mru;
    mtu;
    pap;
    peer-ip-address-optional;
}
primary-dns primary-dns;
primary-wins primary-wins;
secondary-dns secondary-dns;
secondary-wins secondary-wins;
```

The `cell-overhead` statement configures the session to use Asynchronous Transfer Mode (*ATM*)-aware egress shaping on the IQ2 PIC.

*bytes* (in the `encapsulation-overhead` statement) configures the number of bytes used as overhead for class-of-service calculations.

*pool-id* (in the `framed-pool` statement) is the name assigned to the address pool.

*seconds* (in the `idle-timeout` statement) is the number of seconds a user can remain idle before the session is terminated. By default, idle timeout is set to 0. You can configure this to be a value in the range from 0 through 4,294,967,295.

*interface-id* (in the `interface-id` statement) is the identifier for the interface representing an L2TP session configured at the `[edit interfaces interface-name unit local-unit-number dial-options]` hierarchy level.

*seconds* (in the `keepalive` statement) is the time period that must elapse before the Junos OS checks the status of the PPP session by sending an echo request to the peer. For each session, Junos OS sends out three keepalives at 10-second intervals and the session is close if there is no response. By default, the time to send a keepalive message is set to 10 seconds. You configure this to be a value in the range from 0 through 32,767.

*primary-dns* (in the `primary-dns` statement) is an IP version 4 (IPv4) address.

*secondary-dns* (in the `secondary-dns` statement) is an IPv4 address.

*primary-wins* (in the `primary-wins` statement) is an IPv4 address.

*secondary-wins* (in the `secondary-wins` statement) is an IPv4 address.

## Apply a PPP Group Profile to a Tunnel

On Mi7 and M10i routers, you can optionally apply a configured *PPP* group profile to a tunnel. For any tunnel client, you can use the `user-group-profile` statement to define default PPP attributes for all users coming in through a tunnel. The user group profile must define PPP attributes. If the user group profile is specified, all users (PPP sessions) use the PPP attributes specified in the user group profile.

When a PPP client enters a tunnel, the Junos OS first applies the PPP user group profile attributes and then any PPP attributes from the local or *RADIUS* server. The PPP attributes defined in the *RADIUS* or local server take precedence over the attributes defined in the user group profile.

To apply configured PPP attributes to a PPP client, include the `user-group-profile` statement at the `[edit access profile profile-name client client-name]` hierarchy level:

```
[edit access profile profile-name client client-name]
user-group-profile profile-name;
```

*profile-name* is a PPP group profile configured at the [edit access group-profile *profile-name*] hierarchy level. When a client enters this tunnel, it uses the user-group-profile attributes as the default attributes.

Use a wildcard client to define a user group profile:

```
[edit access profile profile-name]  
client * {  
    user-group-profile profile-name;  
}
```

## Compress PPP Fields

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- [Monitor PPP Field Compression | 17](#)

By default, PPP does not compress the Layer 2 address, control, and protocol fields. Compressing these fields conserves bandwidth by transmitting less data. For interfaces with PPP, PPP CCC, or PPP TCC encapsulation, the device can compress the Layer 2 address, control, and protocol fields, as defined in RFC 1661, *The Point-to-Point Protocol (PPP)*.

Keep the following in mind when you configure PPP field compression:

- The PPP session restarts when you configure or modify compression options.
- The address, control, and protocol fields cannot be compressed in Link Control Protocol (LCP) packets.

### Address and Control Field Compression

Use address and control field compression (ACFC) to conserve bandwidth by transmitting less data. By default, the address and control fields of PPP-encapsulated packets are not compressed. This means PPP-encapsulated packets are transmitted with two one-byte fields (0xff and 0x03). If you configure ACFC and ACFC is successfully negotiated with the device's peer, the device transmits packets without these two bytes.



**NOTE:** On M320, M120, and T Series routers, ACFC is not supported for any ISO family protocols. Do not include the `acfc` statement at the `[edit interfaces interface-name ppp-options compression]` hierarchy level when you include the `family iso` statement at the `[edit interfaces interface-name unit logical-unit-number]` hierarchy level.

To configure ACFC:

1. In configuration mode, go to the `[edit interfaces interface-name ppp-options]` hierarchy level.

```
[edit]
user@host# edit interfaces interface-name ppp-options
```

2. Include the compression statement at the `[edit interfaces interface-name ppp-options]` hierarchy level and specify `acfc`.

```
[edit interfaces interface-name ppp-options]
user@device# set compression acfc;
```

## Protocol Field Compression

Use Protocol Field Compression (PFC) to compresses the protocol field of PPP-encapsulated packets. PFC conserves bandwidth by transmitting less data. By default, PPP-encapsulated packets are transmitted with a two-byte uncompressed protocol field. For example, IPv4 packets are transmitted with the protocol field set to 0x0021, and MPLS packets are transmitted with the protocol field set to 0x0281. For all protocols with identifiers in the range 0x0000 through 0x00ff, you can configure the router to compress the protocol field to one byte.

To configure PFC:

1. In configuration mode, go to the `[edit interfaces interface-name ppp-options]` hierarchy level.

```
[edit]
user@host# edit interfaces interface-name ppp-options
```

2. Include the `compression` statement at the `[edit interfaces interface-name ppp-options]` hierarchy level and specify `pfc`.

```
[edit interfaces interface-name ppp-options]
user@device# set compression pfc;
```

## Monitor PPP Field Compression

When ACFC and PFC are configured, the local device tries to negotiate ACFC and PFC with its peer. When you include the `compression` statement in the configuration, the PPP session restarts, and the local router sends the ACFC and PFC options in the LCP Configure-Request packet. The ACFC and PFC options inform the local router's peer that the local router can receive packets with compression.

If the peer indicates that it, too, can receive packets with compression, then ACFC and PFC are negotiated. If ACFC is successfully negotiated, the local router can receive packets with or without the address and control bytes included. If PFC is successfully negotiated, the local device can receive packets with either 2-byte (uncompressed) or 1-byte (compressed) protocol fields.

To monitor whether negotiation was successful, issue the `show interfaces interface-name` command. Configured options are displayed in the `Link flags` field for the physical interface. Successfully negotiated options are displayed in the `flags` field for the logical interface.

In this example, both ACFC and PFC are configured, but neither compression feature has been successfully negotiated:

```
user@device# run show interfaces so-0/1/1

Physical interface: so-0/1/1, Enabled, Physical link is Up
  Interface index: 133, SNMP ifIndex: 27
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC3, Loopback: None,
  FCS: 16,
  Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : No-Keepalives ACFC PFC
  LCP state: Opened
  NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls: Not-configured
  CHAP state: Not-configured
  CoS queues    : 4 supported
  Last flapped  : 2004-12-29 10:49:32 PST (00:18:35 ago)
  Input rate    : 0 bps (0 pps)
  Output rate   : 0 bps (0 pps)
```

```

SONET alarms    : None
SONET defects   : None
Logical interface so-0/1/1.0 (Index 68) (SNMP ifIndex 169)
  Flags: Point-To-Point SNMP-Traps ACFC Encapsulation: PPP
  Protocol inet, MTU: 4470
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination: 198.51.100/24, Local: 198.51.100.2, Broadcast: 198.51.100.255

```

## RELATED DOCUMENTATION

*ppp-options*

[compression \(PPP Properties\) | 103](#)

*acfc*

*pfc*

## Configure PPP on ACX Series Routers

### IN THIS SECTION

- [Prepare Interfaces | 19](#)
- [Configure PPP Encapsulation | 19](#)

You can configure PPP encapsulation on physical interfaces on ACX Series routers. PPP is supported on the following MICs on ACX Series routers:

- On ACX1000 routers with 8-port built-in T1/E1 TDM MICs.
- On ACX2000, ACX2100, ACX2200, and ACX4000 routers with 16-port built-in T1/E1 TDM MICs.
- On ACX4000 routers with 16-Port Channelized E1/T1 Circuit Emulation MICs.
- Starting with Release 12.3X54, you can configure Point-to-Point Protocol (PPP) encapsulation on physical interfaces on Channelized OC3/STM1 (Multi-Rate) Circuit Emulation MIC with SFP on ACX4000 Series routers.

## Prepare Interfaces

On ACX Series routers, E1, T1, and NxDS0 interfaces support PPP encapsulation. You might need to configure the interface before you can enable PPP encapsulation for that interface.

1. For full T1/E1 interfaces on which PPP encapsulation needs to be enabled, create the T1/E1 interfaces out of channelized T1/E1 interfaces (CT1/CE1) by including the framing statement at the [edit chassis fpc *fpc-slot* pic *pic-slot*] hierarchy level:

```
[edit chassis fpc fpc-slot pic pic-slot]
user@device# set framing (t1 | e1);
```

2. Configure a CT1 port down to a T1 channel. On the CT1 interface, set the no-partition option and then set the interface type as T1.

```
[edit interfaces ct1-mpc-slot/mic-slot/port-number]
user@device# set no-partition interface-type t1
```

3. Configure a CE1 port down to an E1 channel. On the CE1 interface, set the no-partition option and then set the interface type as E1.

```
[edit interfaces ce1-mpc-slot/mic-slot/port-number]
user@device# set no-partition interface-type e1
```

4. For NxDS0 interfaces on which PPP encapsulation needs to be enabled, partition the CE1 and CT1 interfaces:

```
[edit interfaces interface-name]
user@device# set ce1-x/y/z partition partition-number timeslots timeslots interface-type ds
set ct1-x/y/z partition partition-number timeslots timeslots interface-type ds
```

## Configure PPP Encapsulation

1. To configure the encapsulation on a physical interface, include the encapsulation ppp statement at the [edit interfaces *interface-name*] hierarchy level.
2. (Optional) On interfaces with PPP encapsulation, configure PPP-specific interface properties by including the ppp-options statement at the [edit interfaces *interface-name*] hierarchy level.
3. (Optional) PPP is supported only for IPv4 networks. You can configure the INET family by including the family inet statement at the [edit interfaces *interface-name* unit *logical-unit-number*] hierarchy level.
4. (Optional) You can configure interfaces with PPP encapsulation to support the PPP Challenge Handshake Authentication Protocol (CHAP) and Password Authentication Protocol (PAP).

## Monitor a PPP Session

When PPP session monitoring is enabled, the operating system logs packets that are exchanged during a PPP session. It logs these packets to `/var/log/pppd` by default, or to the file specified in the `traceoptions` statement. When monitoring is configured, the operational mode commands `show ppp summary` and `show ppp interface` display a Monitored flag in the Session flags column or line.

To configure PPP session monitoring:

1. In configuration mode, go to the `[edit protocols ppp]` hierarchy level.

```
[edit]
user@host# edit protocols ppp
```

2. Include the `monitor-session` statement. You can monitor PPP packet exchanges on all PPP sessions or on a single logical interface.

```
[edit protocols ppp]
user@host# set monitor-session (interface-name | all)
```

## Monitor the PPP Process

You can monitor the operations of the device's PPP process (pppd) with the `traceoptions` statement. To monitor the device's pppd:

1. In configuration mode, go to the `[edit protocols ppp traceoptions]` hierarchy level.

```
[edit]
user@host# edit protocols ppp traceoptions
```

2. Configure the name of the file to receive the output of the tracing operation.

```
[edit protocols ppp traceoptions]
user@device# set file filename
```

3. Configure the tracing operation to perform. To specify more than one tracing operation, include multiple flag statements.

```
[edit protocols ppp traceoptions]  
user@device# set flag flag
```

## RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*Logical Interface Properties*

*PPP Subscriber Access Networks Overview*

[Configuring MLPPP](#)

[Accessing Standards Documents on the Internet](#)

*ppp-options*

# Layer 2 Tunneling Protocol (L2TP)

## IN THIS SECTION

- [Minimum L2TP Configuration | 22](#)
- [L2TP Profiles | 23](#)
- [Example: L2TP Multilink PPP Support on Shared Interfaces | 30](#)
- [Example: PPP MP for L2TP | 31](#)
- [Configure L2TP Authentication | 32](#)
- [Example: Configure L2TP | 35](#)
- [Configure L2TP for M7i and M10i Routers | 37](#)

Layer 2 Tunneling Protocol (*L2TP*) is a protocol for tunneling Layer 2 traffic over a Layer 3 network. You can use L2TP to enable Point-to-Point Protocol (*PPP*) tunneling within your network.

L2TP requires an L2TP access concentrator (*LAC*) and an L2TP network server (*LNS*). The LNS is one endpoint of an L2TP tunnel. The LAC, configured on an access device, receives packets from a remote client and forwards them to the LNS on a remote network. The LAC and LNS are peers.

For information about how to configure L2TP for subscriber access , see *L2TP for Subscriber Access Overview*.

## Minimum L2TP Configuration

To define the minimum configuration for L2TP, include at least the following statements at the [edit access] hierarchy level:

```
[edit access]
address-pool pool-name {
    address address-or-prefix;
    address-range low <lower-limit> high <upper-limit>;
}
profile profile-name {
    authentication-order [ authentication-methods ];
    client client-name {
        chap-secret chap-secret;
        l2tp {
            interface-id interface-id;
            maximum-sessions-per-tunnel number;
            ppp-authentication (chap | pap);
            shared-secret shared-secret;
        }
        pap-password pap-password;
        ppp {
            framed-ip-address ip-address;
            framed-pool framed-pool;
            interface-id interface-id;
            primary-dns primary-dns;
            primary-wins primary-wins;
            secondary-dns secondary-dns;
            secondary-wins secondary-wins;
        }
    }
}
radius-server server-address {
```

```

accounting-port port-number;
port port-number;
retry attempts;
secret password;
}

```

**NOTE:** When the LNS is configured with *RADIUS* authentication, the default behavior is to accept the preferred RADIUS-assigned *IP* address. Previously, the default behavior was to accept and install the nonzero peer IP address received in the Internet Protocol Control Protocol (*IPCP*) configuration request packet.

## L2TP Profiles

### IN THIS SECTION

- [Access Profiles | 24](#)
- [Group Profile | 29](#)
- [Reference the Group Profile from the L2TP Profile | 30](#)

Configure profiles for L2TP.

When multiple types of profiles are configured, the operating system only implements one configuration. The operating system prioritizes them as follows, where [edit access profile *profile-name*] overrides all other profile configurations:

1. [edit access profile *profile-name*]
2. [edit access group-profile *profile-name*]
3. [edit access profile *profile-name* user-group-profile *profile-name*]



## Access Profiles

### IN THIS SECTION

- [Configure the L2TP Client | 24](#)
- [Client-Specific Profile | 24](#)
- [Example: Define the Default Tunnel Client | 26](#)
- [Configure the Access Profile | 27](#)
- [Example: Access Profile Configuration | 28](#)

To validate L2TP connections and session requests, you set up access profiles by configuring the profile statement at the [edit access] hierarchy level. You can configure multiple profiles. You can also configure multiple clients for each profile.

### Configure the L2TP Client

To configure the client, include the client statement at the [edit access profile *profile-name*] hierarchy level:

```
[edit access profile profile-name]
client client-name;
```

*client-name* is the peer identity.

For L2TP, you can optionally use the wildcard (\*) to define a default tunnel client to authenticate multiple LACs with the same secret and L2TP attributes. If an LAC with a specific name is not defined in the configuration, the wildcard tunnel client authenticates it.

**NOTE:** The \* for the default client configuration applies only to M Series routers. On MX Series routers, use default instead. See *L2TP LNS Inline Service Interfaces* for more about MX Series routers.

### Client-Specific Profile

To define *L2TP* properties for a client-specific profile, include one or more of the following statements at the [edit access profile *profile-name* client *client-name* l2tp] hierarchy level:

**NOTE:** When you configure the profile, you can configure either L2TP or *PPP* parameters, but not both at the same time.

```
[edit access profile profile-name client client-name l2tp]
interface-id interface-id;
lcp-renegotiation;
local-chap;
maximum-sessions-per-tunnel number;
multilink {
    drop-timeout milliseconds;
    fragment-threshold bytes;
}
ppp-authentication (chap | pap);
shared-secret shared-secret;
```

*interface-id* (in the `interface-id` statement) is the identifier for the interface representing an L2TP session configured at the `[edit interfaces interface-name unit local-unit-number dial-options]` hierarchy level.

*number* (in the `maximum-sessions-per-tunnel` statement) is the maximum number of sessions for an L2TP tunnel.

*shared-secret* (in the `shared-secret` statement) is the shared secret for authenticating the peer.

You can specify PPP authentication (in the `ppp-authentication` statement). By default, the PPP authentication uses CHAP. You can configure this to use Password Authentication Protocol (PAP).

You can configure LNS so it renegotiates LCP with the PPP client (in the `lcp-negotiation` statement). By default, the PPP client negotiates the LCP with the LAC. When you do this, the LNS discards the last sent LCP configuration request and last received LCP configuration request *AVPs* from the LAC; for example, the LCP negotiated between the PPP client and LAC.

You can configure the Junos OS so that the LNS ignores proxy authentication AVPs from the LAC and reauthenticates the PPP client using a CHAP challenge (in the `local-chap` statement). By default, the PPP client is not reauthenticated by the LNS. When you do this, the LNS directly authenticates the PPP client.

You can configure the PPP MP for L2TP if the PPP sessions that are coming into the LNS from the LAC have multilink PPP negotiated. When you do this, you join multilink bundles based on the endpoint discriminator (in the `multilink` statement).

- *milliseconds* (in the `drop-timeout` statement) specifies the number of milliseconds for the timeout that associated with the first fragment on the reassembly queue. If the timeout expires before all the

fragments have been collected, the fragments at the beginning of the reassembly queue are dropped. If the drop timeout is not specified, the Junos OS holds on to the fragments (fragments may still be dropped if the multilink reassembly algorithm determines that another fragment belonging to the packet on a reassembly queue has been lost).

**NOTE:** The drop timeout and fragmentation threshold for a bundled multilink might belong to different tunnels. The different tunnels might have different drop timeout and fragmentation thresholds. We recommend configuring group profiles instead of profiles when you have L2TP tunnels.

- *bytes* specifies the maximum size of a packet, in bytes (in the *fragment-threshold* statement). If a packet exceeds the fragmentation threshold, the Junos OS fragments it into two or more multilink fragments.

### Example: Define the Default Tunnel Client

```
[edit access profile profile-name]
client * {
  l2tp {
    interface-id interface1;
    lcp-renegotiation;
    local-chap;
    maximum-sessions-per-tunnel 500;
    ppp-authentication chap;
    shared-secret "$ABC123";
  }
}
```

For any tunnel client, you can optionally use the user group profile to define default *PPP* attributes for all users coming in through a tunnel. The user group profile must define PPP attributes. If the user group profile is specified, all users (PPP sessions) use the PPP attributes specified in the user group profile. The PPP attributes specified in the local or *RADIUS* server take precedence over those specified in the user group profile.

Optionally, you can use a wildcard client to define a user group profile. When you do this, any client entering this tunnel uses the PPP attributes (defined user group profile attributes) as its default PPP attributes.

## Configure the Access Profile

**NOTE:** When you configure a profile, you can only configure either L2TP or PPP parameters. You cannot configure both at the same time.

1. To configure the access profile, include the profile statement at the [edit access] hierarchy level and assign a name to the profile:

```
[edit access]
user@device# set profile profile-name
```

2. To configure the L2TP properties for a profile, include the following statements at the [edit access profile *profile-name*] hierarchy level:

```
[edit access profile profile-name]
client client-name {
    group-profile profile-name;
    l2tp {
        interface-id interface-id;
        lcp-renegotiation;
        local-chap;
        maximum-sessions-per-tunnel number;
        ppp-authentication (chap | pap);
        shared-secret shared-secret;
    }
}
user-group-profile profile-name;
```

3. You can configure the order in which the operating system tries different methods to authenticate peers. For each access attempt, the software tries the first configured authentication method. Configure the authentication order using the `authentication-order` statement. If you do not include the `authentication-order` statement, the operating system verifies clients using password authentication.

```
[edit access profile profile-name]
user@device# set authentication-order [ authentication-methods ]
```

In *authentication-methods*, specify one or more of the following in the preferred order. When you configure the authentication methods for L2TP, only the first configured authentication method is used.

- radius—Verify the client using RADIUS authentication services.
- password—Verify the client using the information configured at the [edit access profile *profile-name* client *client-name*] hierarchy level.

For L2TP, RADIUS authentication servers are configured at the [edit access radius-server] hierarchy level. For more information about configuring RADIUS authentication servers, see ["Configuring RADIUS Authentication for L2TP" on page 57](#).

## SEE ALSO

| *profile*

## Example: Access Profile Configuration

The following example shows a configuration of an access profile:

```
[edit access]
profile westcoast_bldg_1 {
  client white {
    chap-secret "$ABC123";
    # SECRET-DATA
    ppp {
      idle-timeout 22;
      primary-dns 198.51.100.10;
      framed-ip-address 198.51.100.12/24;
    }
    group-profile westcoast_users;
  }
  client blue {
    chap-secret "$ABC123";
    # SECRET-DATA
    group-profile sunnyvale_users;
  }
  authentication-order password;
}
profile westcoast_bldg_1_tunnel {
  client test {
    l2tp {
      shared-secret "$ABC123";
      # SECRET-DATA
      maximum-sessions-per-tunnel 75;
```

```

        ppp-authentication chap;
    }
    group-profile westcoast_tunnel;
}
client production {
    l2tp {
        shared-secret "$ABC123";
        # SECRET-DATA
        ppp-authentication chap;
    }
    group-profile westcoast_tunnel;
}
}

```

## Group Profile

You can optionally configure a group profile. Any client referencing the configured group profile inherits all the group profile attributes. This makes it easier to apply L2TP on a larger scale.

To configure the L2TP for the group profile, include the following statements at the [edit access group-profile *profile-name* l2tp] hierarchy level:

```

[edit access group-profile profile-name l2p]
interface-id interface-id;
lcp-renegotiation;
local-chap;
maximum-sessions-per-tunnel number;

```

*interface-id* is the identifier for the interface representing an L2TP session configured at the [edit interfaces *interface-name* unit *local-unit-number* dial-options] hierarchy level.

You can configure the LNS so that it renegotiates the link control protocol (LCP) with the PPP client (in the renegotiation statement). By default, the PPP client negotiates the LCP with the L2TP access concentrator (LAC). When you do this, the LNS discards the last sent and the last received LCP configuration request attribute value pairs (AVPs) from the LAC; for example, the LCP negotiated between the PPP client and the LAC.

You can configure Junos OS so that the LNS ignores proxy authentication AVPs from the LAC and reauthenticates the PPP client using a CHAP challenge (in the local-chap statement). When you do this, the LNS directly authenticates the PPP client. By default, the PPP client is not reauthenticated by the LNS.

*number* is the maximum number of sessions per L2TP tunnel.

## Reference the Group Profile from the L2TP Profile

You can reference a configured group profile from the *L2TP* tunnel profile.

To reference the group profile configured at the [edit access group-profile *profile-name*] hierarchy level, include the group-profile statement at the [edit access profile *profile-name* client *client-name*] hierarchy level:

```
[edit access profile profile-name client client-name]
group-profile profile-name;
```

*profile-name* references a configured group profile from a PPP user profile.

## Example: L2TP Multilink PPP Support on Shared Interfaces

```
[edit]
interfaces {
  sp-1/3/0 {
    traceoptions {
      flag all;
    }
    unit 0 {
      family inet;
    }
    unit 20 {
      dial-options {
        l2tp-interface-id test;
        shared;
      }
      family inet;
    }
  }
}
access {
  profile t {
    client cholera {
      l2tp {
        interface-id test;
        multilink;
        shared-secret "$ABC123"; # SECRET-DATA
```

```

    }
  }
}
profile u {
  authentication-order radius;
}
radius-server {
  192.168.65.63 {
    port 1812;
    secret "$ABC123"; # SECRET-DATA
  }
}
}
services {
  l2tp {
    tunnel-group 1 {
      tunnel-access-profile t;
      user-access-profile u;
      local-gateway {
        address 10.70.1.1;
      }
      service-interface sp-1/3/0;
    }
    traceoptions {
      flag all;
      debug-level packet-dump;
      filter {
        protocol l2tp;
        protocol ppp;
        protocol radius;
      }
    }
  }
}
}

```

## Example: PPP MP for L2TP

```

[edit access]
profile tunnel-profile {

```



```

client remote-host {
    l2tp {
        multilink {
            drop-timeout 600;
            fragmentation-threshold 100;
        }
    }
}

```

## Configure L2TP Authentication

### IN THIS SECTION

- [Configure the CHAP Secret for an L2TP Profile | 32](#)
- [Example: Configuring L2TP PPP CHAP | 33](#)
- [Configure the PAP Password for an L2TP Profile | 34](#)
- [Example: Configure PAP for an L2TP Profile | 34](#)

L2TP does not include any authentication methods, so it is flexible and can be used with your preferred security features. When you configure *PPP* properties for an *L2TP* profile, you typically configure the `chap-secret` statement or `pap-password` statement.

### Configure the CHAP Secret for an L2TP Profile

*CHAP* allows each end of a *PPP* link to authenticate its peer, as defined in RFC 1994. The authenticator sends its peer a randomly generated challenge that the peer must encrypt using a one-way hash; the peer must then respond with that encrypted result. The key to the hash is a secret known only to the authenticator and authenticated. When the response is received, the authenticator compares its calculated result with the peer's response. If they match, the peer is authenticated.

Each end of the link identifies itself to its peer by including its name in the CHAP challenge and response packets it sends to the peer. This name defaults to the local hostname, or you can explicitly set it using the `local-name` option. When a host receives a CHAP challenge or CHAP response packet on a particular interface, it uses the peer identity to look up the CHAP secret key to use.

**NOTE:** When you configure PPP properties for a Layer 2 Tunneling Protocol (*L2TP*) profile, you typically configure the `chap-secret` statement or `pap-password` statement.

To configure CHAP, include the profile statement and specify a profile name at the `[edit access]` hierarchy level:

```
[edit access]
profile profile-name {
  client client-name chap-secret data;
}
```

Then reference the CHAP profile name at the `[edit interfaces interface-name ppp-options chap]` hierarchy level.

You can configure multiple profiles. You can also configure multiple clients for each profile.

`profile` is the mapping between peer identifiers and CHAP secret keys. The identity of the peer contained in the CHAP challenge or response queries the profile for the secret key to use.

`client` is the peer identity.

`chap-secret secret` is the secret key associated with that peer.

### Example: Configuring L2TP PPP CHAP

```
[edit]
access {
  profile westcoast_bldg1 {
    client cpe-1 chap-secret "$ABC123";
    # SECRET-DATA
    client cpe-2 chap-secret "$ABC123";
    # SECRET-DATA
  }
}
```

## Configure the PAP Password for an L2TP Profile

To configure the Password Authentication Protocol (*PAP*) password, include the `pap-password` statement at the `[edit access profile profile-name client client-name]` hierarchy level:

```
[edit access profile profile-name client client-name]  
pap-password pap-password;
```

*pap-password* is the password for PAP.

## Example: Configure PAP for an L2TP Profile

```
[edit access]  
profile sunnyvale_bldg_2 {  
  client green {  
    pap-password "$ABC123";  
    ppp {  
      interface-id west;  
    }  
    group-profile sunnyvale_users;  
  }  
  client red {  
    chap-secret "$ABC123";  
    group-profile sunnyvale_users;  
  }  
  authentication-order radius;  
}  
profile Sunnyvale_bldg_1_tunnel {  
  client test {  
    l2tp {  
      shared-secret "$ABC123";  
      ppp-authentication pap;  
    }  
  }  
}
```

## Example: Configure L2TP

```
[edit]
access {
    address-pool customer_a {
        address 10.1.1.1/32;
    }
    address-pool customer_b {
        address-range low 10.2.2.2 high 10.2.3.2;
    }
    group-profile westcoast_users {
        ppp {
            framed-pool customer_a;
            idle-timeout 15;
            primary-dns 10.192.65.1;
            secondary-dns 10.192.65.2;
            primary-wins 10.192.65.3;
            secondary-wins 10.192.65.4;
            interface-id west;
        }
    }
    group-profile eastcoast_users {
        ppp {
            framed-pool customer_b;
            idle-timeout 20;
            primary-dns 10.192.65.5;
            secondary-dns 10.192.65.6;
            primary-wins 10.192.65.7;
            secondary-wins 10.192.65.8;
            interface-id east;
        }
    }
    group-profile westcoast_tunnel {
        l2tp {
            maximum-sessions-per-tunnel 100;
        }
    }
    group-profile east_tunnel {
        l2tp {
            maximum-sessions-per-tunnel 125;
        }
    }
}
```

```

}
profile westcoast_bldg_1 {
    client white {
        chap-secret "$ABC123";
        # SECRET-DATA
        ppp {
            idle-timeout 22;
            primary-dns 10.192.65.10;
            framed-ip-address 10.12.12.12/32;
        }
        group-profile westcoast_users;
    }
    client blue {
        chap-secret "$ABC123";
        # SECRET-DATA
        group-profile sunnyvale_users;
    }
    authentication-order password;
}
profile west-coast_bldg_2 {
    client red {
        pap-password "$ABC123";
        # SECRET-DATA
        ppp {
            idle-timeout 22;
            primary-dns 10.192.65.11;
            framed-ip-address 10.12.12.12/32;
        }
        group-profile westcoast_users;
    }
}
profile westcoast_bldg_1_tunnel {
    client test {
        l2tp {
            shared-secret "$ABC123";
            # SECRET-DATA
            maximum-sessions-per-tunnel 75;
            ppp-authentication chap;# The default for PPP authentication is CHAP.
        }
        group-profile westcoast_tunnel;
    }
    client production {
        l2tp {

```

```

        shared-secret "$ABC123
        ABC123"; # SECRET-DATA
        ppp-authentication chap;
    }
    group-profile westcoast_tunnel;
}
}
profile westcoast_bldg_2_tunnel {
    client black {
        l2tp {
            shared-secret "$ABC123
            ABC123";
            # SECRET-DATA
            ppp-authentication pap;
        }
        group-profile westcoast_tunnel;
    }
}
}
}

```

## Configure L2TP for M7i and M10i Routers

For M7i and M10i routers, you can configure Layer 2 Tunneling Protocol (*L2TP*) tunneling security services on an Adaptive Services Physical Interface Card (*PIC*) or a MultiServices PIC.

To configure L2TP, include the following statements at the [edit access] hierarchy level:

```

[edit access]
address-pool pool-name {
    address address-or-prefix;
    address-range low <lower-limit> high <upper-limit>;
}
group-profile profile-name {
    l2tp {
        interface-id interface-id;
        lcp-renegotiation;
        local-chap;
        maximum-sessions-per-tunnel number;
        ppp {
            cell-overhead;

```

```

        encapsulation-overhead bytes;
        framed-pool pool-id;
        idle-timeout seconds;
        interface-id interface-id;
        keepalive seconds;
        primary-dns primary-dns;
        primary-wins primary-wins;
        secondary-dns secondary-dns;
        secondary-wins secondary-wins;
    }
}

profile profile-name {
    authentication-order [ authentication-methods ];
    accounting-order radius;
    client client-name {
        chap-secret chap-secret;
        group-profile profile-name;
        l2tp {
            interface-id interface-id;
            lcp-renegotiation;
            local-chap;
            maximum-sessions-per-tunnel number;
            ppp-authentication (chap | pap);
            shared-secret shared-secret;
        }
        pap-password pap-password;
        ppp {
            cell-overhead;
            encapsulation-overhead bytes;
            framed-ip-address ip-address;
            framed-pool framed-pool;
            idle-timeout seconds;
            interface-id interface-id;
            keepalive seconds;
            primary-dns primary-dns;
            primary-wins primary-wins;
            secondary-dns secondary-dns;
            secondary-wins secondary-wins;
        }
        user-group-profile profile-name;
    }
}

radius-disconnect-port port-number {

```

```

radius-disconnect {
    client-address {
        secret password;
    }
}

radius-server server-address {
    accounting-port port-number;
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    source-address source-address;
    timeout seconds;
}
}

```

#### RELATED DOCUMENTATION

[Address Pool for L2TP Network Server IP Address Allocation | 39](#)

[RADIUS Authentication for L2TP | 57](#)

## Address Pool for L2TP Network Server IP Address Allocation

With an *address pool*, you configure an address or address range. When you define an address pool for a client, the *L2TP* network server (*LNS*) allocates *IP* addresses for clients from an address pool. If you do not want to use an address pool, you can specify an IP address by means of the `framed-ip-address` statement at the `[edit access profile profile-name client client-name ppp]` hierarchy level. For information about specifying an IP address, see "[Point-to-Point Protocol \(PPP\)](#)" on page 4.

**NOTE:** When an address pool is modified or deleted, all the sessions using that pool are deleted.



To define an address or a range of addresses, include the `address-pool` statement at the `[edit access]` hierarchy level:

```
[edit access]
address-pool pool-name;
```

*pool-name* is the name assigned to the address pool.

To configure an address, include the `address` statement at the `[edit access address-pool pool-name]` hierarchy level:

```
[edit access address-pool pool-name]
address address-or-prefix;
```

*address-or-prefix* is one address or a prefix value.

When you specify an address range, it cannot exceed 65,535 IP addresses.

To configure the address range, include the `address-range` statement at the `[edit access address-pool pool-name]` hierarchy level:

```
[edit access address-pool pool-name]
address-range <low lower-limit> <high upper-limit>;
```

- `low lower-limit`—The lower limit of an address range.
- `high upper-limit`—The upper limit of an address range.

**NOTE:** The address pools for user access and Network Address Translation (NAT) can overlap. When you configure an address pool at the `[edit access address-pool pool-name]` hierarchy level, you can also configure an address pool at the `[edit services nat pool pool-name]` hierarchy level.

## RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*Address-Assignment Pools for Subscriber Management*

# IKE Access Profiles

An Internet Key Exchange (*IKE*) access profile is used to negotiate IKE and *IPsec* security associations with *dynamic peers*. You can configure only one tunnel profile per service set for all dynamic peers. The configured *preshared key* in the profile is used for IKE authentication of all dynamic peers terminating in that service set. You can also use the digital certificate method for IKE authentication with dynamic peers. Include the `ike-policy policy-name` statement at the `[edit access profile profile-name client * ike]` hierarchy level. *policy-name* is the name of the IKE policy you define at the `[edit services ipsec-vpn ike policy policy-name]` hierarchy level.

The IKE tunnel profile specifies all the information you need to complete the IKE negotiation. Each protocol has its own statement hierarchy within the client statement to configure protocol-specific attribute value pairs, but only one client configuration is allowed for each profile. The following is the configuration hierarchy.

```
[edit access]
profile profile-name {
  client * {
    ike {
      allowed-proxy-pair {
        remote remote-proxy-address local local-proxy-address;
      }
      dead-peer-detection {
        interval seconds
        threshold number
      }
      ike-policy policy-name;
      initiate-dead-peer-detection;
      interface-id string-value;
      ipsec-policy ipsec-policy;
      pre-shared-key (ascii-text character-string | hexadecimal hexadecimal-digits);
      reverse-route
    }
  }
}
```

For dynamic peers, the Junos OS supports only IKE main mode with both the preshared key and digital certificate methods. In this mode, an IPv6 or IPv4 address is used to identify a tunnel peer to obtain the preshared key or digital certificate information. The client value `*` (wildcard) means that configuration within this profile is valid for all dynamic peers terminating within the service set accessing this profile.

The following statement makes up the IKE profile:

- **allowed-proxy-pair**—During phase 2 IKE negotiation, the remote peer supplies its network address (*remote*) and its peer's network address (*local*). Since multiple dynamic tunnels are authenticated through the same mechanism, this statement must include the list of possible combinations. If the dynamic peer does not present a valid combination, the phase 2 IKE negotiation fails.

By default, *remote 0.0.0.0/0 local 0.0.0.0/0* is used if no values are configured.

- **dead-peer-detection**—Enable the device to use dead peer detection (DPD). DPD is a method used by devices to verify the current existence and availability of IPsec peer devices. A device performs this verification by sending encrypted IKE Phase 1 notification payloads (R-U-THERE) to peers and waiting for DPD acknowledgements (R-U-THERE-ACK). Use the option *interval* to specify the seconds between which messages should be sent. Use the *threshold* option to specify the maximum number of messages (1-10) to be sent.
- **ike-policy**—Name of the IKE policy that defines either the local digital certificate or the preshared key used to authenticate the dynamic peer during IKE negotiation. You must include this statement to use the digital certificate method for IKE authentication with a dynamic peer. You define the IKE policy at the `[edit services ipsec-vpn ike policy policy-name]` hierarchy level.
- **initiate-dead-peer-detection**—Detects dead peers on dynamic IPsec tunnels.
- **interface-id**—Interface identifier, a mandatory attribute used to derive the logical service interface information for the session.
- **ipsec-policy**—Name of the IPsec policy that defines the IPsec policy information for the session. You define the IPsec policy at the `[edit services ipsec-vpn ipsec policy policy-name]` hierarchy level. If no policy is set, any policy proposed by the dynamic peer is accepted.
- **pre-shared-key**—Key used to authenticate the dynamic peer during IKE phase 1 negotiation. This key is known to both ends through an out-of-band secure mechanism. You can configure the value either in hexadecimal or *ascii-text* format. It is a mandatory value.
- **reverse-route** —(M Series and MX Series routers with an AS or MultiServices PIC only) Configure a reverse route for dynamic endpoint IPsec tunnels.

## RELATED DOCUMENTATION

# 3

CHAPTER

## Configuring Authentication for PPP and L2TP

---

PPP Challenge Handshake Authentication Protocol | 44

Example: Configure CHAP Authentication with RADIUS | 49

PPP Password Authentication Protocol | 53

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# PPP Challenge Handshake Authentication Protocol

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- [Configuring the PPP Challenge Handshake Authentication Protocol | 44](#)
- [Displaying the Configured PPP Challenge Handshake Authentication Protocol | 47](#)
- [Example: Configuring PPP CHAP | 48](#)

## PPP Challenge Handshake Authentication Protocol

For interfaces with PPP encapsulation, you can configure interfaces to support the PPP Challenge Handshake Authentication Protocol (*CHAP*), as defined in RFC 1994, PPP Challenge Handshake Authentication Protocol (CHAP). When you enable CHAP on an interface, the interface can authenticate its peer and can be authenticated by its peer. By default, PPP CHAP is disabled. If CHAP is not explicitly enabled, the interface makes no CHAP challenges and denies all incoming CHAP challenges. To enable CHAP, you must create an access profile, and you must configure the interfaces to use CHAP.

CHAP allows each end of a PPP link to authenticate its peer, as defined in RFC 1994. The authenticator sends its peer a randomly-generated challenge that the peer must encrypt using a one-way *hash*; the peer must then respond with that encrypted result. The key to the hash is a secret known only to the authenticator and authenticated. When the response is received, the authenticator compares its calculated result with the peer's response. If they match, the peer is authenticated.

Each end of the link identifies itself to its peer by including its name in the CHAP challenge and response packets it sends to the peer. This name defaults to the local hostname, or you can explicitly set it using the `local-name` option. When a host receives a CHAP challenge or CHAP response packet on a particular interface, it uses the peer identity to look up the CHAP secret key to use.

## Configuring the PPP Challenge Handshake Authentication Protocol

To enable CHAP, you must create an access profile, and you must configure the interfaces to use PAP.

Definitions:

- `profile` is the mapping between peer identifiers and CHAP secret keys. The identity of the peer contained in the CHAP challenge or response queries the profile for the secret key to use.
- `client` is the peer identity.
- `chap-secret` is the secret key associated with that peer.

1. To create an access profile, include the `profile` statement at the `[edit access]` hierarchy level:

```
[edit access]
user@host# set profile profile-name {
```

2. To identify the peer and the secret key associated with that peer, include the `client` statement at the `[edit access profile profile-name]` hierarchy level:

```
[edit access profile profile-name]
user@host# set client client-name chap-secret chap-secret
```

You can configure multiple CHAP profiles, and configure multiple clients for each profile. For more information on how to configure access profile, see ["Point-to-Point Protocol \(PPP\)" on page 4](#) and ["Layer 2 Tunneling Protocol \(L2TP\)" on page 21](#).

When you configure an interface to use CHAP, you must assign an access profile to the interface. When an interface receives CHAP challenges and responses, the access profile in the packet is used to look up the shared secret, as defined in RFC 1994. If no matching access profile is found for the CHAP challenge that was received by the interface, the optionally configured default CHAP secret is used. The default CHAP secret is useful if the CHAP name of the peer is unknown, or if the CHAP name changes during PPP link negotiation.

To configure the PPP CHAP, on each physical interface with PPP encapsulation, perform the following steps.

1. To assign an access profile to an interface, include the `access-profile` statement at the `[edit interfaces interface-name ppp-options chap]` hierarchy level.

```
[edit interfaces interface-name ppp-options chap]
user@host# set access-profile name
```

**NOTE:** You must include the `access-profile` statement when you configure the CHAP authentication method. If an interface receives a CHAP challenge or response from a peer that is not in the applied access profile, the link is immediately dropped unless a default CHAP secret has been configured.

2. The default CHAP secret is used when no matching CHAP access profile exists, or if the CHAP name changes during PPP link negotiation. To configure a default CHAP secret for an interface, include the `default-chap-secret` statement at the `[edit interfaces interface-name ppp-options chap]` hierarchy level.

```
[edit interfaces interface-name ppp-options chap]
user@host# set default-chap-secret name
```

3. To configure the name the interface uses in CHAP challenge and response packets, include the `local-name` statement at the `[edit interfaces interface-name ppp-options chap]` hierarchy level:

```
[edit interfaces interface-name ppp-options chap]
user@host# set local-name name
```

**NOTE:**

- The local name is any string from 1 through 32 characters in length, starting with an alphanumeric or underscore character, and including only the following characters:

a-z A-Z 0-9 % @ # / \ . \_ -

- By default, when CHAP is enabled on an interface, the interface uses the router's system hostname as the name sent in CHAP challenge and response packets.

4. You can configure the interface not to challenge its peer, and only respond when challenged. To configure the interface not to challenge its peer, include the `passive` statement at the `[edit interfaces interface-name ppp-options chap]` hierarchy level:

```
[edit interfaces interface-name ppp-options chap]
user@host# set passive;
```

**NOTE:** By default, when CHAP is enabled on an interface, the interface always challenges its peer and responds to challenges from its peer.

## Displaying the Configured PPP Challenge Handshake Authentication Protocol

### IN THIS SECTION

- Purpose | 47
- Action | 47
- Meaning | 48

### Purpose

To display the configured PPP CHAP at the [edit access] and [edit interfaces] hierarchy levels.

- Access profile—pe-A-ppp-clients
- default CHAP secret data—"\$ABC123"
- hostname for the CHAP challenge and response packets—"pe-A-so-1/1/1"
- Interface—so-1/1/2

### Action

- Run the show command at the [edit access] hierarchy level.

```
profile pe-A-ppp-clients;  
client cpe-1 chap-secret "$ABC123";  
                # SECRET-DATA  
[edit interfaces so-1/2/0]  
encapsulation ppp;  
ppp-options {
```



```

    chap {
        access-profile pe-A-ppp-clients;
        default-chap-secret "$ABC123";
        local-name "pe-A-so-1/1/1";
    }
}

```

- Run the show command at the [edit interfaces so-1/1/2] hierarchy level.

```

ppp-options {
    chap {
        access-profile pe-A-ppp-clients;
        default-chap-secret "$ABC123";
        local-name "pe-A-so-1/1/2";
    }
}

```

## Meaning

The configured CHAP and its associated set options are displayed as expected.

## Example: Configuring PPP CHAP

```

[edit]
access {
    profile pe-A-ppp-clients {
        client cpe-1 chap-secret "$ABC123";
        # SECRET-DATA
        client cpe-2 chap-secret "$ABC123";
        # SECRET-DATA
    }
}
interfaces {
    so-1/1/1 {
        encapsulation ppp;
        ppp-options {
            chap {
                access-profile pe-A-ppp-clients;

```

```
        local-name "pe-A-so-1/1/1";
    }
}
so-1/1/2 {
    encapsulation ppp;
    ppp-options {
        chap {
            passive;
            access-profile pe-A-ppp-clients;
            local-name "pe-A-so-1/1/2";
        }
    }
}
```

#### RELATED DOCUMENTATION

[Example: Configure CHAP Authentication with RADIUS | 49](#)

[PPP Password Authentication Protocol | 53](#)

## Example: Configure CHAP Authentication with RADIUS

#### IN THIS SECTION

- [Configuration | 50](#)

## Configuration

### IN THIS SECTION

- [CLI Quick Configuration | 50](#)

You can send *RADIUS* messages through a routing instance to customer *RADIUS* servers in a private network. To configure the routing instance to send packets to a *RADIUS* server, include the `routing-instance statement` at the `[edit access profile profile-name radius-server]` hierarchy level and apply the profile to an interface with the `access-profile statement` at the `[edit interfaces interface-name unit logical-unit-number ppp-options chap]` hierarchy level.

In this example, *PPP* peers of interfaces `at-0/0/0.0` and `at-0/0/0.1` are authenticated by a *RADIUS* server reachable via routing instance A. *PPP* peers of interfaces `at-0/0/0.2` and `at-0/0/0.3` are authenticated by a *RADIUS* server reachable via routing instance B.

For more information about *RADIUS* authentication, see *RADIUS Authentication*.

### CLI Quick Configuration

```
system {
  radius-server {
    192.0.2.1 secret $ABC123;
    192.0.2.2 secret $ABC123;
  }
}
routing-instances {
  A {
    instance-type vrf;
    ...
  }
  B {
    instance-type vrf;
    ...
  }
}
access {
  profile A-PPP-clients {
```

```

authentication-order radius;
radius-server {
    192.0.2.3 {
        port 3333;
        secret "$ABC123"; # # SECRET-DATA
        timeout 3;
        retry 3;
        source-address 192.0.2.99;
        routing-instance A;
    }
    192.0.2.4 {
        routing-instance A;
        secret $ABC123;
    }
}
}
profile B-PPP-clients {
    authentication-order radius;
    radius-server {
        192.0.2.5 {
            routing-instance B;
            secret $ABC123;
        }
        192.0.2.6 {
            routing-instance B;
            secret $ABC123;
        }
    }
}
}
interfaces {
    at-0/0/0 {
        atm-options {
            vpi 0;
        }
        unit 0 {
            encapsulation atm-ppp-llc;
            ppp-options {
                chap {
                    access-profile A-PPP-clients;
                }
            }
        }
        keepalives {

```

```

        interval 20;
        up-count 5;
        down-count 5;
    }
    vci 0.128;
    family inet {
        address 192.0.2.21/32 {
            destination 192.0.2.22;
        }
    }
}
unit 1 {
    encapsulation atm-ppp-llc;
    ...
    ppp-options {
        chap {
            access-profile A-PPP-clients;
        }
    }
    ...
}
unit 2 {
    encapsulation atm-ppp-llc;
    ...
    ppp-options {
        chap {
            access-profile B-PPP-clients;
        }
    }
    ...
}
unit 3 {
    encapsulation atm-ppp-llc;
    ...
    ppp-options {
        chap {
            access-profile B-PPP-clients;
        }
    }
    ...
}
...
}

```

```
...
}
```

Users who log in to the router with *telnet* or *SSH* connections are authenticated by the RADIUS server 192.0.2.1. The backup RADIUS server for these users is 192.0.2.2.

Each profile may contain one or more backup RADIUS servers. In this example, PPP peers are *CHAP* authenticated by the RADIUS server 192.0.2.3 (with 192.0.2.4 as the backup server) or RADIUS server 192.0.2.5 (with 192.0.2.6 as the backup server).

## RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

[PPP Challenge Handshake Authentication Protocol | 44](#)

# PPP Password Authentication Protocol

## IN THIS SECTION

- [Understanding PAP | 53](#)
- [Configure PAP on a Physical Interface | 54](#)
- [Configure PAP on a Logical Interface | 55](#)

## Understanding PAP

The Password Authentication Protocol (PAP) provides a simple method for the peer to establish its identity using a two-way handshake. After the link is established, an ID and password pair is repeatedly sent by the peer to the authenticator until authentication is acknowledged or the connection is terminated. This is done only upon initial link establishment.

For interfaces with PPP encapsulation, you can configure interfaces to support the PAP, as defined in RFC 1334, *PAP Authentication Protocols*. If authentication is configured, the PPP link negotiates using CHAP or PAP protocol for authentication during the Link Control Protocol (LCP) negotiation phase. PAP is only performed after the link establishment phase (LCP up) portion of the authentication phase.

During authentication, the PPP link sends a PAP authentication-request packet to the peer with an ID and password. The authentication-request packet is sent every 2 seconds, similar to the CHAP challenge, until a response (acknowledgment packet or nonacknowledgment packet) is received. If an acknowledgment packet is received, the PPP link transitions to the next state, the network phase. If a nonacknowledgment packet is received, an LCP terminate request is sent, and the PPP link goes back to the link establishment phase.

If no response is received, and an optional retry counter is set to true, a new request acknowledgment packet is resent. If the retry counter expires, the PPP link transitions to the LCP negotiate phrase.

You can configure the PPP link with PAP in passive mode. By default, when PAP is enabled on an interface, the interface expects authenticate-request packets from the peer. However, the interface can be configured to send authentication request packets to the peer by configuring PAP to operate in passive mode. In PAP passive mode, the interface sends the authenticate-request packets to the peer only if the interface receives the PAP option from the peer during LCP negotiation. In passive mode, the interface does not authenticate the peer.

## Configure PAP on a Physical Interface

To enable PAP, you must create an access profile, and you must configure the interfaces to use PAP. For more information on how to configure access profile, see ["Point-to-Point Protocol \(PPP\)" on page 4](#).

When you configure an interface to use PAP, you must assign an access profile to the interface. When an interface receives PAP authentication requests, the access profile in the packet is used to look up the password.

To configure the PPP password authentication protocol, on each physical interface with PPP encapsulation, perform the following steps.

1. To assign an access profile to an interface, include the `access-profile` statement at the `[edit interfaces interface-name ppp-options pap]` hierarchy level.

```
[edit interfaces interface-name ppp-options pap]
user@host# set access-profile name
```

2. To configure the name the interface uses in PAP request and response packets, include the `local-name` statement at the `[edit interfaces interface-name ppp-options pap]` hierarchy level:

```
[edit interfaces interface-name ppp-options pap]
user@host# set local-name name
```

3. You need to configure the password to be used for authentication. To configure the host password for sending PAP requests, include the `local-password` statement at the `[edit interfaces interface-name ppp-options pap]` hierarchy level:

```
[edit interfaces interface-name ppp-options pap]
user@host# set local-password password
```

**NOTE:** By default, when PAP is enabled on an interface, the interface uses the router's system hostname as the name sent in PAP request and response packets.

4. To configure the interface to authenticate with PAP in passive mode, include the `passive` statement at the `[edit interfaces interface-name ppp-options pap]` hierarchy level:

```
[edit interfaces interface-name ppp-options pap]
user@host# set passive
```

**NOTE:** By default, when PAP is enabled on an interface, the interface expects authenticate-request packets from the peer. However, the interface can be configured to send authentication request packets to the peer by configuring PAP to operate in passive mode. In PAP passive mode, the interface sends the authenticate-request packets to the peer only if the interface receives the PAP option from the peer during LCP negotiation. In passive mode, the interface does not authenticate the peer.

## Configure PAP on a Logical Interface

When you configure an interface to use PAP, you must assign an access profile to the interface. When an interface receives PAP authentication requests, the access profile in the packet is used to look up the password. If no matching access profile is found for the PAP authentication request that was received by the interface, the optionally configured default PAP password is used.

To configure PAP, perform the following steps on each logical interface with PPP encapsulation.

1. The default PAP password is used when no matching PAP access profile exists, or if the PAP access profile name changes during PPP link negotiation. To configure the default PAP password, include the



`default-pap-password` statement at the [edit interfaces *interface-name* unit *logical-unit-number* ppp-options pap] hierarchy level:

```
[edit interfaces interface-name unit logical-unt-number ppp-options pap]
user@host# set default-pap-password password
```

2. To configure the name the interface uses in PAP request and response packets, include the `local-name` statement at the [edit interfaces *interface-name* unit *logical-unt-number* ppp-options pap] hierarchy level:

```
[edit interfaces interface-name ppp-options pap]
user@host# set local-name name
```

**NOTE:** By default, when PAP is enabled on an interface, the interface uses the router's system hostname as the name sent in PAP request and response packets.

3. You need to configure the password to be used for authentication. To configure the host password for sending PAP requests, include the `local-password` statement at the [edit interfaces *interface-name* ppp-options pap] hierarchy level:

```
[edit interfaces interface-name unit logical-unt-number ppp-options pap]
user@host# set local-password password
```

4. To configure the interface to authenticate with PAP in passive mode, include the `passive` statement at the [edit interfaces *interface-name* unit *logical-unt-number* ppp-options pap] hierarchy level:

```
[edit interfaces interface-name unit logical-unt-number ppp-options pap]
user@host# set passive
```

**NOTE:** By default, when PAP is enabled on an interface, the interface expects authenticate-request packets from the peer. However, the interface can be configured to send authentication request packets to the peer by configuring PAP to operate in passive mode. In PAP passive mode, the interface sends the authenticate-request packets to the peer only if the interface receives the PAP option from the peer during LCP negotiation—in passive mode, the interface does not authenticate the peer.

**SEE ALSO**

[PPP Challenge Handshake Authentication Protocol | 44](#)

## RADIUS Authentication for L2TP

**IN THIS SECTION**

- [Configure RADIUS Authentication for L2TP | 57](#)
- [Configure RADIUS Authentication for an L2TP Client and Profile | 59](#)
- [RADIUS Local Loopback Interface Attribute for L2TP | 60](#)
- [Example: Configure RADIUS Authentication for L2TP | 61](#)
- [Example: Configure RADIUS Authentication for an L2TP Profile | 62](#)
- [Configure the RADIUS Disconnect Server for L2TP | 63](#)
- [Configure RADIUS Accounting Order for L2TP | 64](#)
- [Example: Configure RADIUS-Based Subscriber Authentication and Accounting | 65](#)
- [RADIUS Attributes for L2TP | 68](#)

### Configure RADIUS Authentication for L2TP

The *L2TP* network server (*LNS*) sends *RADIUS* authentication requests or accounting requests. Authentication requests are sent out to the authentication server port. Accounting requests are sent to the accounting port. To configure RADIUS authentication for L2TP on an M10i or M7i router, include the following statements at the [edit access] hierarchy level:

```
[edit access]
radius-server server-address {
    accounting-port port-number;
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    source-address source-address;
```

```

    timeout seconds;
}

```

**NOTE:** The RADIUS servers at the [edit access] hierarchy level are not used by the network access server process (NASD).

You can specify an accounting port number on which to contact the accounting server (in the accounting-port statement). Most RADIUS servers use port number 1813 (as specified in RFC 2866, *Radius Accounting*).

**NOTE:** If you enable RADIUS accounting at the [edit access profile *profile-name* accounting-order] hierarchy level, accounting is triggered on the default port of 1813 even if you do not specify a value for the accounting-port statement.

*server-address* specifies the address of the RADIUS authentication server (in the radius-server statement).

You can specify a port number on which to contact the RADIUS authentication server (in the port statement). Most RADIUS servers use port number 1812 (as specified in RFC 2865, *Remote Authentication Dial In User Service [RADIUS]*).

You must specify a password in the secret statement. If a password includes spaces, enclose the password in quotation marks. The secret used by the local router must match that used by the RADIUS authentication server.

Optionally, you can specify the amount of time that the local router waits to receive a response from a RADIUS server (in the timeout statement) and the number of times that the router attempts to contact a RADIUS authentication server (in the retry statement). By default, the router waits 3 seconds. You can configure this to be a value in the range from 1 through 90 seconds. By default, the router retries connecting to the server three times. You can configure this to be a value in the range from 1 through 30 times. If the maximum number of retries is reached, the radius server is considered dead for 5 minutes (300 seconds).

In the source-address statement, specify a source address for each configured RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address. The source address is a valid IPv4 address configured on one of the router interfaces.

To configure multiple RADIUS servers, include multiple radius-server statements.

**NOTE:** When the L2TP network server (LNS) is configured with RADIUS authentication, the default behavior is to accept the preferred RADIUS-assigned IP address. Previously, the default behavior was to accept and install the nonzero peer IP address received by the Internet Protocol Control Protocol (IPCP) configuration request packet.

## Configure RADIUS Authentication for an L2TP Client and Profile

On an M10i or M7i router, L2TP supports RADIUS authentication and accounting for users with one set of RADIUS servers under the [edit access] hierarchy. You can also configure RADIUS authentication for each tunnel client or user profile.

To configure the RADIUS authentication for L2TP tunnel clients on an M10i or M7i router, include the `ppp-profile` statement with the `l2tp` attributes for tunnel clients:

```
[edit access profile profile-name client client-name l2tp]
ppp-profile profile-name;
```

`ppp-profile profile-name` specifies the profile used to validate PPP session requests through L2TP tunnels. Clients of the referenced profile must have only PPP attributes. The referenced group profile must be defined.

To configure the RADIUS authentication for a profile, include following statements at the [edit access profile *profile-name*] hierarchy level:

```
[edit access profile profile-name]
radius-server server-address {
    accounting-port port-number;
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    source-address source-address;
    timeout seconds;
}
```

When a PPP user initiates a session and RADIUS authentication is configured for the user profile on the tunnel group, the following priority sequence is used to determine which RADIUS server is used for authentication and accounting:

- If the `ppp-profile` statement is configured under the tunnel client (LAC), the RADIUS servers configured under the specified `ppp-profile` are used.
- If RADIUS servers are configured under the user profile for the tunnel group, those servers will be used.
- If no RADIUS server is configured for the tunnel client (LAC) or user profile, then the RADIUS servers configured at the `[edit access]` hierarchy level are used.

## RADIUS Local Loopback Interface Attribute for L2TP

You can configure the Local-Loopback-Interface attribute on a RADIUS server to manage multiple LAC devices. This attribute is used as the LAC source address on an LNS tunnel for PPPoE subscribers tunneled over L2TP.

When you use the Tunnel-Client-Endpoint attribute as the LAC source address, you must configure the Tunnel-Client-Endpoint attribute for each MX Series router that uses the same RADIUS server. Starting with this release you can use the Local-Loopback-Interface attribute, which needs to be configured only once. When the LAC initiates an Access-Request message to RADIUS for authentication, RADIUS returns the Local-Loopback-Interface attribute in the Access-Accept message. This attribute contains the name of the loopback interface, either as a generic interface name such as "lo0" or as a specific name like "lo0.0". The MX Series router then uses the configured loopback interface IP address as the source address during tunnel negotiation with the LNS.

**NOTE:** An MX Series router can act as the LAC and use any interface address on it as an L2TP tunnel source address. The source address can be dynamically assigned by RADIUS through the Tunnel-Client-Endpoint or Local-Loopback-Interface attribute. The tunnel source address can be statically configured on the MX Series router by using the L2TP tunnel profile. If RADIUS does not return the Tunnel-Client-Endpoint or Local-Loopback-Interface attribute, and if there is no corresponding L2TP tunnel profile configured on the MX Series router, then the L2TP tunnel fails to initiate because the router does not have a proper tunnel source address. In this case, the router can use the locally configured loopback address as the source address to successfully establish the L2TP tunnel.

## Example: Configure RADIUS Authentication for L2TP

### IN THIS SECTION

- [Configuration](#) | 61

## Configuration

### IN THIS SECTION

- [CLI Quick Configuration](#) | 61

## CLI Quick Configuration

The following example shows how to configure RADIUS authentication for L2TP:

```
[edit access]
profile example_bldg {
  client client_1 {
    chap-secret "$ABC123";
    ppp {
      interface-id west;
    }
    group-profile example_users;
  }
  client client_2 {
    chap-secret "$ABC123";
    group-profile example_users;
  }
  authentication-order radius;
}
radius-server {
  198.51.100.213 {
    port 1812;
    accounting-port 1813;
```

```

        secret "$ABC123"; # SECRET-DATA
    }
    198.51.100.223 {
        port 1812;
        accounting-port 1813;
        secret "$ABC123"; # SECRET-DATA
    }
}
radius-disconnect-port 2500;
radius-disconnect {
    198.51.100.152 secret "$ABC123";
    # SECRET-DATA
    198.51.100.153 secret "$ABC123";
    # SECRET-DATA
    198.51.100.157 secret "$ABC123";
    # SECRET-DATA
    198.51.100.173 secret "$ABC123";
    # SECRET-DATA
}

```

## Example: Configure RADIUS Authentication for an L2TP Profile

### IN THIS SECTION

- [Configuration | 62](#)

## Configuration

### IN THIS SECTION

- [CLI Quick Configuration | 63](#)

## CLI Quick Configuration

```
[edit access]
profile t {
  client LAC_A {
    l2tp {
      ppp-profile u;
    }
  }
}
profile u {
  client client_1 {
    ppp {
    }
  }
  198.51.100.5 {
    port 3333;
    secret $ABC123;
    source-address 198.51.100.1;
    retry 3;
    timeout 3;
  }
  198.51.100.6 secret $ABC123;
  198.51.100.7 secret $ABC123;
}
```

## Configure the RADIUS Disconnect Server for L2TP

To configure the RADIUS disconnect server to listen for disconnect requests from an administrator and process them, include the following statements at the [edit access] hierarchy level:

```
[edit access]
radius-disconnect-port port-number;
radius-disconnect {
  client-address {
    secret password;
  }
}
```



*port-number* is the server port to which the RADIUS client sends disconnect requests. The L2TP network server, which accepts these disconnect requests, is the server. You can specify a port number on which to contact the RADIUS disconnect server. Most RADIUS servers use port number 1700.

**NOTE:** The Junos OS accepts only disconnect requests from the client address configured at the [edit access radius-disconnect *client-address*] hierarchy level.

*client-address* is the host sending disconnect requests to the RADIUS server. The client address is a valid IP address configured on one of the router or switch interfaces.

*password* authenticates the RADIUS client. Passwords can contain spaces. The secret used by the local router must match that used by the server.

For information about how to configure RADIUS authentication for L2TP, see ["Configuring RADIUS Authentication for L2TP" on page 57](#).

The following example shows the statements to be included at the [edit access] hierarchy level to configure the RADIUS disconnect server:

```
[edit access]
radius-disconnect-port 1700;
radius-disconnect {
  198.51.100.153 secret "$ABC123";
  # SECRET-DATA
  198.51.100.162 secret "$ABC123";
  # SECRET-DATA
}
```

## Configure RADIUS Accounting Order for L2TP

You can configure *RADIUS* accounting for an L2TP profile. With RADIUS accounting enabled, Juniper devices can act as RADIUS clients. They can notify the RADIUS server about user activities such as software logins, configuration changes, and interactive commands. The framework for RADIUS accounting is described in RFC 2866.

To configure RADIUS accounting, include the accounting-order statement at the [edit access profile *profile-name*] hierarchy level:

```
[edit access profile profile-name]  
accounting-order radius;
```

When you enable RADIUS accounting for an L2TP profile, it applies to all the clients within that profile. You must enable RADIUS accounting on at least one L2TP profile for the RADIUS authentication server to send accounting stop and start messages.

**NOTE:** When you enable RADIUS accounting for an L2TP profile, you do not need to configure the accounting-port statement at the [edit access radius-server *server-address*] hierarchy level. When you enable RADIUS accounting for an L2TP profile, accounting is triggered on the default port of 1813.

For L2TP, RADIUS authentication servers are configured at the [edit access radius-server] hierarchy level.

## Example: Configure RADIUS-Based Subscriber Authentication and Accounting

### IN THIS SECTION

- [Configuration | 65](#)

## Configuration

### IN THIS SECTION

- [CLI Quick Configuration | 66](#)

## CLI Quick Configuration

```
[edit access]
radius-server {
  198.51.100.250 {
    port 1812;
    accounting-port 1813;
    accounting-retry 6;
    accounting-timeout 20;
    retry 3;
    secret $ABC123$ABC123;
    source-address 198.51.100.100;
    timeout 45;
  }
  198.51.100.251 {
    port 1812;
    accounting-port 1813;
    accounting-retry 6;
    accounting-timeout 20;
    retry 3;
    secret $ABC123;
    source-address 198.51.100.100;
    timeout 30;
  }
  2001:DB8:0f101::2{
    port 1812;
    accounting-port 1813;
    accounting-retry 6;
    accounting-timeout 20;
    retry 4;
    secret $ABC123$ABC123$ABC123-;
    source-address 2001:DB8:0f101::1;
    timeout 20;
  }
}
profile isp-bos-metro-fiber-basic {
  authentication-order radius;
  accounting {
    order radius;
    accounting-stop-on-access-deny;
    accounting-stop-on-failure;
    immediate-update;
  }
}
```

```

statistics time;
update-interval 12;
wait-for-acct-on-ack;
send-acct-status-on-config-change;
}
radius {
authentication-server 198.51.100.251 198.51.100.252;
accounting-server 198.51.100.250 198.51.100.251;
options {
accounting-session-id-format decimal;
client-accounting-algorithm round-robin;
client-authentication-algorithm round-robin;
nas-identifier 56;
nas-port-id-delimiter %;
nas-port-id-format {
nas-identifier;
interface-description;
}
nas-port-type {
ethernet {
wireless-80211;
}
}
}
attributes {
ignore {
framed-ip-netmask;
}
exclude {
accounting-delay-time [accounting-start accounting-stop];
accounting-session-id [access-request accounting-on accounting-off
accounting-start accounting-stop];
dhcp-gi-address [access-request accounting-start accounting-stop];
dhcp-mac-address [access-request accounting-start accounting-stop];
nas-identifier [access-request accounting-start accounting-stop];
nas-port [accounting-start accounting-stop];
nas-port-id [accounting-start accounting-stop];
nas-port-type [access-request accounting-start accounting-stop];
}
}
}
}
}

```

```
[edit logical-systems isp-bos-metro-12 routing-instances isp-cmbrg-12-32]
interfaces {
  lo0 {
    unit 0 {
      family inet {
        address 198.51.100.100/24;
      }
    }
  }
  ge-0/0/0 {
    vlan-tagging;
    unit 0 {
      vlan-id 200;
      family inet {
        unnumbered-address lo0.0;
      }
    }
  }
}
}
```

## RADIUS Attributes for L2TP

Junos OS supports the following types of RADIUS attributes for L2TP:

- Juniper Networks vendor-specific attributes (VSAs)
- Attribute-value pairs (AVPs) defined by the Internet Engineering Task Force (IETF)
- RADIUS accounting stop and start AVPs

Juniper Networks vendor-specific RADIUS attributes are described in RFC 2865, *Remote Authentication Dial In User Service (RADIUS)*. These attributes are encapsulated with the vendor ID set to the Juniper Networks ID number 2636. [Table 1 on page 68](#) lists the Juniper Networks VSAs you can configure for L2TP.

**Table 1: Juniper Networks Vendor-Specific RADIUS Attributes for L2TP**

Attribute Name	Standard Number	Value
Juniper-Primary-DNS	31	IP address

**Table 1: Juniper Networks Vendor-Specific RADIUS Attributes for L2TP (Continued)**

Attribute Name	Standard Number	Value
Juniper-Primary-WINS	32	IP address
Juniper-Secondary-DNS	33	IP address
Juniper-Secondary-WINS	34	IP address
Juniper-Interface-ID	35	String
Juniper-IP-Pool-Name	36	String
Juniper-Keep-Alive	37	Integer

[Table 2 on page 69](#) lists the IETF RADIUS AVPs supported for LT2P.

**Table 2: Supported IETF RADIUS Attributes for L2TP**

Attribute Name	Standard Number	Value
User-Name	1	String
User-Password	2	String
CHAP-Password	3	String
NAS-IP-Address	4	IP address
NAS-Port	5	Integer
Service-Type	6	Integer
Framed-Protocol	7	Integer

**Table 2: Supported IETF RADIUS Attributes for L2TP (Continued)**

Attribute Name	Standard Number	Value
Framed-IP-Address	8	IP address
Framed-IP-Netmask	9	IP address
Framed-MTU	12	Integer
Framed-Route	22	String
Session-Timeout	27	Integer
Idle-Timeout	28	Integer
Called-Station-ID	30	String
Calling-Station-ID	31	String
CHAP-Challenge	60	String
NAS-Port-Type	61	Integer
Framed-Pool	88	Integer

[Table 3 on page 70](#) lists the supported RADIUS accounting start AVPs for L2TP.

**Table 3: Supported RADIUS Accounting Start Attributes for L2TP**

Attribute Name	Standard Number	Value
User-Name	1	String
NAS-IP-Address	4	IP address

**Table 3: Supported RADIUS Accounting Start Attributes for L2TP (Continued)**

Attribute Name	Standard Number	Value
NAS-Port	5	Integer
Service-Type	6	Integer
Framed-Protocol	7	Integer
Framed-IP-Address	8	IP address
Called-Station-ID	30	String
Calling-Station-ID	31	String
Acct-Status-Type	40	Integer
Acct-Delay-Time	41	Integer
Acct-Session-ID	44	String
Acct-Authentic	45	Integer
NAS-Port-Type	61	Integer
Tunnel-Client-Endpoint	66	String
Tunnel-Server-Endpoint	67	String
Acct-Tunnel-Connection	68	String
Tunnel-Client-Auth-ID	90	String



**Table 3: Supported RADIUS Accounting Start Attributes for L2TP (Continued)**

Attribute Name	Standard Number	Value
Tunnel-Server-Auth-ID	91	String

[Table 4 on page 72](#) lists the supported RADIUS accounting stop AVPs for L2TP.

**Table 4: Supported RADIUS Accounting Stop Attributes for L2TP**

Attribute Name	Standard Number	Value
User-Name	1	String
Local-Loopback-Interface	3	String
NAS-IP-Address	4	IP address
NAS-Port	5	Integer
Service-Type	6	Integer
Framed-Protocol	7	Integer
Framed-IP-Address	8	IP address
Called-Station-ID	30	String
Calling-Station-ID	31	String
Acct-Status-Type	40	Integer
Acct-Delay-Time	41	Integer
Acct-Input-Octets	42	Integer

**Table 4: Supported RADIUS Accounting Stop Attributes for L2TP (Continued)**

Attribute Name	Standard Number	Value
Acct-Output-Octets	43	Integer
Acct-Session-ID	44	String
Acct-Authentic	45	Integer
Acct-Session-Time	46	Integer
Acct-Input-Packets	47	Integer
Acct-Output-Packets	48	Integer
Acct-Terminate-Cause	49	Integer
Acct-Multi-Session-ID	50	String
Acct-Link-Count	51	Integer
NAS-Port-Type	61	Integer
Tunnel-Client-Endpoint	66	String
Tunnel-Server-Endpoint	67	String
Acct-Tunnel-Connection	68	String
Tunnel-Client-Auth-ID	90	String
Tunnel-Server-Auth-ID	91	String

## RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

## Subscriber Session Timeout Options

Subscriber session timeout options enable you to place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both. The subscriber session options apply to both L2TP-tunneled and PPP-terminated subscriber sessions. For DHCP subscribers, the session timeout limits the DHCP lease time.

**NOTE:** To configure the timeout attributes in RADIUS, refer to the documentation for your RADIUS server.

To configure limitations on subscriber sessions, configure the session options in the client profile that applies to the subscriber:

- Terminate the subscriber when the configured session timeout expires, regardless of activity.

```
[edit access profile profile-name session-options]  
user@host# set client-session-timeout minutes
```

- Terminate the subscriber when there is no ingress or egress data traffic for the duration of the configured idle timeout.

```
[edit access profile profile-name session-options]  
user@host# set client-idle-timeout minutes
```

- Terminate the subscriber when there is no ingress data traffic for the duration of the configured idle timeout; ignore egress traffic.

```
[edit access profile profile-name session-options]  
user@host# set client-idle-timeout minutes  
user@host# set client-idle-timeout-ingress-only
```

For example, to configure session timeout options in the acc-prof client profile, specifying an idle timeout of 15 minutes, that only ingress traffic is monitored, and that the session times out after 120 minutes:

```
[edit]
access {
  profile {
    acc-prof {
      session-options {
        client-idle-timeout 15;
        client-idle-timeout-ingress-only;
        client-session-timeout 120;
      }
    }
  }
}
```

# 4

CHAPTER

## Configuration Statements

---

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---

# accounting (Access Profile)

## IN THIS SECTION

- [Syntax | 79](#)
- [Hierarchy Level | 80](#)
- [Description | 80](#)
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## Syntax

```
accounting {  
    accounting-stop-on-access-deny;  
    accounting-stop-on-failure;  
    address-change-immediate-update;  
    ancp-speed-change-immediate-update;  
    coa-immediate-update;  
    coa-no-override service-class-attribute;  
    duplication;  
    duplication-filter;  
    duplication-vrf {  
        access-profile-name profile-name;  
        vrf-name vrf-name;  
    }  
    immediate-update;  
    order [accounting-method];  
    send-acct-status-on-config-change  
    statistics (time | volume-time);  
    update-interval minutes;  
    wait-for-acct-on-ack;  
}
```



## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

Configure RADIUS accounting parameters and enable RADIUS accounting for an access profile.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

---

*RADIUS Accounting for Subscriber Access*

*RADIUS Authentication and Accounting Basic Configuration*

# accounting-order

## IN THIS SECTION

- [Syntax | 81](#)
- [Hierarchy Level | 81](#)
- [Description | 81](#)
- [Options | 81](#)
- [Required Privilege Level | 82](#)
- [Release Information | 82](#)

## Syntax

```
accounting-order (radius | [accounting-order-data-list]);
```

## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

Specify the order in which accounting methods are used.

## Options

**radius**—Use the RADIUS accounting method.

[*accounting-order-data-list*]*—*Set of data listing the accounting order to be used, enclosed in brackets. This can be any combination of accounting methods, up to and including a list of the entire accounting order.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.0.

### RELATED DOCUMENTATION

[RADIUS Authentication for L2TP | 57](#)

*accounting (System)*

# accounting-stop-on-access-deny

### IN THIS SECTION

- [Syntax | 83](#)
- [Hierarchy Level | 83](#)
- [Description | 83](#)
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- [Release Information | 83](#)

## Syntax

```
accounting-stop-on-access-deny;
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Configure RADIUS accounting to send an Acct-Stop message when the AAA server refuses a client request for access.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Authentication and Accounting Basic Configuration*

# accounting-stop-on-failure

## IN THIS SECTION

- Syntax | 84
- Hierarchy Level | 84
- Description | 84
- Required Privilege Level | 85
- Release Information | 85

## Syntax

```
accounting-stop-on-failure;
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Configure RADIUS accounting to send an Acct-Stop message when a subscriber session has been successfully authenticated and authorized, but then fails before an Acct-Start message is sent. By default, an Acct-Stop message is sent only if an Acct-Start message has been exchanged with the accounting server.

Consider a situation where RADIUS address pools are used to assign IP/IPv6 addresses. After a subscriber session is successfully authenticated, the RADIUS server authorizes the session by assigning an IP address from the RADIUS address pool and conveying that address in the Framed-IP-Address attribute. If a negotiation failure occurs at this point, the session is terminated before activating. The

Acct-Start message is never sent because it is initiated by session activation. By default, an Acct-Stop message cannot be sent because the Acct-Start is never sent. However, if the `acct-stop-on-failure` statement is configured, the negotiation failure causes the Acct-Stop message to be sent, which explicitly notifies the RADIUS server that the session is disconnected and that it can free the allocated IP address back to the pool.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Authentication and Accounting Basic Configuration*

# address-assignment (Address-Assignment Pools)

## IN THIS SECTION

- [Syntax | 86](#)
- [Hierarchy Level | 86](#)
- [Description | 87](#)
- [Options | 87](#)
- [Required Privilege Level | 88](#)
- [Release Information | 88](#)

## Syntax

```

address-assignment {
    abated-utilization percentage;
    abated-utilization-v6 percentage;
    high-utilization percentage;
    high-utilization-v6 percentage;
    neighbor-discovery-router-advertisement ndra-pool-name;
    pool pool-name {
        active-drain;
        family family {
            dhcp-attributes {
                protocol-specific attributes;
            }
            excluded-address ip-address;
            excluded-range name low minimum-value high maximum-value;
            host hostname {
                hardware-address mac-address;
                ip-address ip-address;
            }
            network ip-prefix/<prefix-length>;
            prefix ipv6-prefix;
            range range-name {
                high upper-limit;
                low lower-limit;
                prefix-length prefix-length;
            }
        }
        hold-down;
        link pool-name;
    }
}

```

## Hierarchy Level

[edit access]

## Description

Configure address-assignment pools that can be used by different client applications.

**NOTE:** Support for subordinate statements is platform-specific. See individual statement topics for support information.

## Options

- |  |  |
|--|--|
| <b>abated-utilization</b>                      | <p>Generate SNMP traps for DHCP address pools or linked set of address pools. No SNMP traps are generated unless a value is configured. Default: Abated utilization is not set. Delete the abated-utilization value to unset.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>percentage</i>—Threshold below which an SNMP trap clear is generated. Range: 1 through 98.</li> </ul>   |
| <b>abated-utilization-v6</b>                   | <p>Generate SNMP traps for DHCPv6 address pools or linked set of address pools. No SNMP traps are generated unless a value is configured. Default: Abated utilization is not set. Delete the abated-utilization value to unset.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>percentage</i>—Threshold below which an SNMP trap clear is generated. Range: 1 through 98.</li> </ul> |
| <b>high-utilization</b>                        | <p>Generate an SNMP trap when the DHCP address pool or linked set of address pools use surpasses the specified percentage. Default: High utilization is not set. Delete the high-utilization value to unset.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>percentage</i>—Percentage used to generate a trap. Range: 2 through 99.</li> </ul>                                       |
| <b>high-utilization-v6</b>                     | <p>Generate an SNMP trap when the DHCPv6 address pool or linked set of address pools use surpasses the specified percentage. Default: High utilization is not set. Delete the high-utilization value to unset.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>percentage</i>—Percentage used to generate a trap. Range: 2 through 99.</li> </ul>                                     |
| <b>neighbor-discovery-router-advertisement</b> | <p>Configure the name of the address-assignment pool used to assign the router advertisement prefix.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ndra-pool-name</i>—Name of the address-assignment pool.</li> </ul>   |



The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

---

*Address-Assignment Pools for Subscriber Management*

---

*L2TP LNS Inline Service Interfaces*

---

[Configuring an Address-Assignment Pool Used for Router Advertisements](#)

# address-pool

### IN THIS SECTION

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- [Hierarchy Level | 89](#)
- [Description | 89](#)
- [Options | 89](#)
- [Required Privilege Level | 90](#)
- [Release Information | 90](#)

## Syntax

```
address-pool pool-name {
    address address-or-prefix;
    address-range <low lower-limit> <high upper-limit>;
}
```

## Hierarchy Level

```
[edit access]
```

## Description

Allocate IP addresses for clients.

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.

## Options

- |                         |  |
|-------------------------|--|
| <b><i>pool-name</i></b> | Name assigned to an address pool.  |
| <b>address</b>          | (EX Series, M Series, PTX Series, T Series only) Configure the IP address or prefix value for clients. <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>address-or-prefix</i>—An address or prefix value.</li> </ul> |
| <b>address-range</b>    | Configure the address range. <ul style="list-style-type: none"> <li>• Values:</li> </ul>   |

- high *upper-limit*—Upper limit of an address range.
- low *lower-limit*—Lower limit of an address range.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Address Pool for L2TP Network Server IP Address Allocation](#) | 39

# attributes (RADIUS Attributes)

## IN THIS SECTION

- [Syntax](#) | 91
- [Hierarchy Level](#) | 91
- [Description](#) | 92
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- [Required Privilege Level](#) | 93
- [Release Information](#) | 93

## Syntax

```

attributes {
    exclude {
        attribute-name packet-type;
        standard-attribute number {
            packet-type [ access-request | accounting-off | accounting-on | accounting-start |
accounting-stop ];
        }
        vendor-id id-number {
            vendor-attribute vsa-number {
                packet-type [ access-request | accounting-off | accounting-on | accounting-start
| accounting-stop ];
            }
        }
    }
    ignore {
        dynamic-iflset-name;
        framed-ip-netmask;
        idle-timeout;
        input-filter;
        logical-system-routing-instance;
        output-filter;
        session-timeout;
        standard-attribute number;
        vendor-id id-number {
            vendor-attribute vsa-number;
        }
    }
}

```

## Hierarchy Level

```
[edit access profile profile-name radius]
```

## Description

Specify how the router or switch processes RADIUS attributes.

## Options

**exclude** Configure the router or switch to exclude the specified attributes from being sent in the specified type of RADIUS message. Exclusion can be useful, for example, for attributes that do not change values over the lifetime of a subscriber. By not sending these attributes, you reduce the packet size without losing information. Contrast this behavior with that provided by the `ignore` statement.

The options for this statement are explained separately. Click the linked statement for details.

**ignore** Configure the router or switch to ignore the specified attributes in RADIUS Access-Accept messages. Standard attributes and VSAs received in RADIUS messages take precedence over internally provisioned attribute values. Ignoring the attributes enables your internally provisioned values to be used instead. Contrast this behavior with that provided by the `exclude` statement.

Starting in Junos OS Release 18.1R1, you can specify RADIUS standard attributes with the attribute number. You can specify vendor-specific attributes (VSAs) with the IANA-assigned vendor ID and the VSA number. With this flexible configuration method, you can configure any standard attribute and VSA supported by your platform to be ignored. The configuration has no effect if you can configure unsupported attributes, vendors, and VSAs.

The legacy method allows you to configure only those attributes and VSAs for which the statement syntax includes a specific option. Consequently, you can use the legacy method to ignore only a subset of all attributes that can be received in Access-Accept messages.

- Values:
  - `dynamic-iflset-name`—Ignore Juniper Networks VSA 26-130, Qos-Set-Name.
  - `framed-ip-netmask`—Ignore RADIUS attribute 9, Framed-IP-Netmask.
  - `idle-timeout`—Ignore RADIUS attribute 28, Idle-Timeout.
  - `input-filter`—Ignore Juniper Networks VSA 26-10, Ingress-Policy-Name.
  - `logical-system-routing-instance`—Ignore Juniper Networks VSA 26-1.

- `output-filter`—Ignore Juniper Networks VSA 26-11, Egress-Policy-Name.
- `session-timeout`—Ignore RADIUS attribute 27, Session-Timeout.
- `standard-attribute` *number*—RADIUS standard attribute number supported by your platform. You can enclose multiple values in square brackets to specify a list of attributes. If you configure an unsupported attribute, that configuration has no effect. Range: 1 through 255.
- `vendor-attribute` *vsa-number*—Number identifying a VSA belonging to the specified vendor; both must be supported by your platform. You can enclose multiple values in square brackets to specify a list of VSAs. If you configure an unsupported VSA, that configuration has no effect. Range: 1 through 255.
- `vendor-id` *id-number*—IANA vendor ID supported by your platform. If you configure an unsupported vendor ID, that configuration has no effect. Range: 1 through 16777215.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*Standard and Vendor-Specific RADIUS Attributes*

# authentication-order

## IN THIS SECTION

- [Syntax | 94](#)
- [Hierarchy Level | 94](#)
- [Description | 94](#)
- [Options | 95](#)
- [Required Privilege Level | 96](#)
- [Release Information | 96](#)

## Syntax

```
authentication-order [ authentication-methods ];
```

## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

Set the order in which AAA tries different authentication methods when verifying that a client can access the router or switch. For each login attempt, AAA tries the authentication methods in order, from first to last.

A given subscriber does not undergo both authentication and authorization as separate steps. When both `authentication-order` and `authorization-order` are specified, DHCP subscribers honor the configured authorization order, all other subscribers use the configured authentication-order.

Starting in Junos OS Release 18.2R1, the `password` option can also be used to specify that local authentication and local authorization is attempted for individual subscribers that are configured with the subscriber statement at the `[edit access profile profile-name]` hierarchy level.

## Options

### *authentication-methods*

Ordered list of methods to use for authentication attempts. The list includes one or more of the following methods in any combination:

- `nasreq`—Verify subscribers using the Diameter-based Network Access Server Requirements (NASREQ) protocol.
- `none`—No authentication is performed. Grants authentication without examining the client credentials. Can be used, for example, when the Diameter function Gx-Plus is employed for notification during subscriber provisioning.

**NOTE:** Subscriber access management does not support the `none` option; authentication fails when this option is specified.

- `password`—Verify the client using the information configured at the `[edit access profile profile-name client client-name]` hierarchy level.

Subscriber access management does not support the `password` option until Junos OS Release 18.2R1. Starting in Junos OS Release 18.2R1, this option is used to enable local authentication and optionally local authorization for individual subscribers. Local authentication is typically used when you do not have external authentication and authorization servers. The password itself must be configured with the subscriber statement in the same access profile. Local authentication is performed when a subscriber logs in with a matching username; it succeeds if the subscribers login password matches the password in the profile.

If you have external authentication and authorization servers, you can use local authentication as a backup authentication method. In this case, configure `password` other than first in the list of methods.

- `radius`—Verify the client using RADIUS authentication services.
- `s6a`—Verify subscribers using the Diameter-based s6a protocol.
- **Default:** `password`



## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

none option added in Junos OS Release 11.2.

nasreq option added in Junos OS Release 16.1.

s6a option added in Junos OS Release 19.3R1.

### RELATED DOCUMENTATION

[Example: Configure CHAP Authentication with RADIUS | 49](#)

*RADIUS Authentication and Accounting Basic Configuration*

[Example: Configure S6a Application](#)

# cell-overhead

### IN THIS SECTION

- [Syntax | 97](#)
- [Hierarchy Level | 97](#)
- [Description | 97](#)
- [Required Privilege Level | 97](#)
- [Release Information | 97](#)

## Syntax

```
cell-overhead;
```

## Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the session to use Asynchronous Transfer Mode (ATM)-aware egress shaping on the IQ2 PIC.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.3.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

# circuit-type (DHCP Local Server)

## IN THIS SECTION

- [Syntax | 98](#)
- [Hierarchy Level | 98](#)
- [Description | 99](#)
- [Required Privilege Level | 99](#)
- [Release Information | 99](#)

## Syntax

```
circuit-type;
```

## Hierarchy Level

```
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server dhcpv6 authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server dhcpv6 group group-name authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server group group-name authentication username-include],
[edit logical-systems logical-system-name system services dhcp-local-server authentication username-
include],
[edit logical-systems logical-system-name system services dhcp-local-server dhcpv6 authentication
username-include],
[edit logical-systems logical-system-name system services dhcp-local-server dhcpv6 group group-
name authentication username-include],
[edit logical-systems logical-system-name system services dhcp-local-server group group-name
authentication username-include],
```

```
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server dhcpv6 authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server dhcpv6 group group-name authentication username-include],
[edit logical-systems logical-system-name routing-instances routing-instance-name system
services dhcp-local-server group group-name authentication username-include],
[edit routing-instances routing-instance-name system services dhcp-local-server authentication
username-include],
[edit routing-instances routing-instance-name system services dhcp-local-server dhcpv6
authentication username-include],
[edit routing-instances routing-instance-name system services dhcp-local-server dhcpv6 group
group-name authentication username-include],
[edit routing-instances routing-instance-name system services dhcp-local-server group group-name
authentication username-include],
[edit system services dhcp-local-server authentication username-include],
[edit system services dhcp-local-server dhcpv6 authentication username-include],
[edit system services dhcp-local-server dhcpv6 group group-name authentication username-include],
[edit system services dhcp-local-server group group-name authentication username-include]
```

## Description

Specify that the circuit type is concatenated with the username during the subscriber authentication or client authentication process.

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

## RELATED DOCUMENTATION

[Specifying Authentication Support](#)

# client

## IN THIS SECTION

- [Syntax | 100](#)
- [Hierarchy Level | 101](#)
- [Description | 101](#)
- [Options | 102](#)
- [Required Privilege Level | 103](#)
- [Release Information | 103](#)

## Syntax

```
client client-name {  
    chap-secret chap-secret;  
    group-profile profile-name;  
    ike {  
        allowed-proxy-pair {  
            remote remote-proxy-address local local-proxy-address;  
        }  
        pre-shared-key (ascii-text character-string | hexadecimal hexadecimal-digits);  
        ike-policy policy-name;  
        interface-id string-value;  
    }  
    l2tp {  
        aaa-access-profile profile-name;  
        interface-id interface-id;  
        lcp-renegotiation;  
        local-chap;  
        maximum-sessions number;
```

```

maximum-sessions-per-tunnel number;
multilink {
    drop-timeout milliseconds;
    fragment-threshold bytes;
}
override-result-code session-out-of-resource;
ppp-authentication (chap | pap);
ppp-profile profile-name;
sessions-limit-group;
service-profile profile-name(parameter)&profile-name;
shared-secret shared-secret;
}
pap-password pap-password;
ppp {
    cell-overhead;
    encapsulation-overhead bytes;
    framed-ip-address ip-address;
    framed-pool framed-pool;
    idle-timeout seconds;
    interface-id interface-id;
    keepalive seconds;
    primary-dns primary-dns;
    primary-wins primary-wins;
    secondary-dns secondary-dns;
    secondary-wins secondary-wins;
}
user-group-profile profile-name;
}

```

## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

Configure the peer identity.

**NOTE:** Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.

## Options

- |                           |   |
|---------------------------|---|
| <b><i>client-name</i></b> | A peer identity. For L2TP clients, you can use a special name to configure a default client. This client enables the LNS to accept any LAC to establish the session. On M Series routers, use * for the default client configuration. On MX Series routers, use default.  |
| <b>chap-secret</b>        | <p>For interfaces with PPP encapsulation on which the PPP Challenge Handshake Authentication Protocol (CHAP) is configured, configure the shared secret (the CHAP secret key associated with a peer), as defined in RFC 1994. This statement is not supported for L2TP LNS on MX Series routers.</p> <ul style="list-style-type: none"> <li>• Values:             <ul style="list-style-type: none"> <li>• <i>chap-secret</i>—The secret key associated with a peer.</li> </ul> </li> </ul> |
| <b>group-profile</b>      | <p>Associate a group profile with a client. This statement is not supported for L2TP LNS on MX Series routers.</p> <ul style="list-style-type: none"> <li>• Values:             <ul style="list-style-type: none"> <li>• <i>profile-name</i>—Name assigned to the group profile.</li> </ul> </li> </ul>   |
| <b>pap-password</b>       | <p>Configure the Password Authentication Protocol (PAP) password. This statement is not supported for L2TP LNS on MX Series routers.</p> <ul style="list-style-type: none"> <li>• Values:             <ul style="list-style-type: none"> <li>• <i>password</i>—PAP password.</li> </ul> </li> </ul>   |
| <b>user-group-profile</b> | <p>Apply a configured PPP group profile to PPP users. If user-group-profile is modified or deleted, the existing LNS subscribers, which were using this Layer 2 Tunneling Protocol client configuration, go down.</p> <ul style="list-style-type: none"> <li>• Values:             <ul style="list-style-type: none"> <li>• <i>profile-name</i>—Name of a PPP group profile configured at the [edit access group-profile <i>profile-name</i>] hierarchy level.</li> </ul> </li> </ul>       |

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

---

[PPP Challenge Handshake Authentication Protocol](#) | 44

---

[Point-to-Point Protocol \(PPP\)](#) | 4

---

[Layer 2 Tunneling Protocol \(L2TP\)](#) | 21

---

*L2TP LNS Inline Service Interfaces*

# compression (PPP Properties)

### IN THIS SECTION

- [Syntax](#) | 104
- [Hierarchy Level](#) | 104
- [Description](#) | 104
- [Required Privilege Level](#) | 104
- [Release Information](#) | 104



## Syntax

```
compression {  
    acfc;  
    pfc;  
}
```

## Hierarchy Level

```
[edit interfaces interface-name ppp-options],  
[edit interfaces interface-name unit logical-unit-number ppp-options],  
[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-  
options]
```

## Description

For interfaces with PPP encapsulation, set Link Control Protocol (LCP) compression options.

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

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

# dead-peer-detection

## IN THIS SECTION

- [Syntax | 105](#)
- [Hierarchy Level | 105](#)
- [Description | 106](#)
- [Options | 106](#)
- [Required Privilege Level | 106](#)
- [Release Information | 107](#)

## Syntax

```
dead-peer-detection {  
    (always-send | optimized | probe-idle-tunnel);  
    interval seconds;  
    threshold number;  
}
```

## Hierarchy Level

```
[edit security ike gateway gateway-name]
```

## Description

Enable the device to use dead peer detection (DPD). DPD is a method used by devices to verify the current existence and availability of IPsec peers. A device performs this verification by sending encrypted IKE Phase 1 notification payloads (R-U-THERE messages) to a peer and waiting for DPD acknowledgements (R-U-THERE-ACK messages) from the peer.

## Options

<b>interval</b>	Specify the amount of time that the peer waits for traffic from its destination peer before sending a dead-peer-detection (DPD) request packet. <ul style="list-style-type: none"> <li>• <b>Default:</b> 10 seconds</li> <li>• <b>Range:</b> 2 through 60 seconds</li> </ul>
<b>always-send</b>	Instructs the device to send dead peer detection (DPD) requests regardless of whether there is outgoing IPsec traffic to the peer.
<b>optimized</b>	Send dead peer detection (DPD) messages if there is no incoming IKE or IPsec traffic within the configured interval after outgoing packets are sent to the peer. This is the default DPD mode.
<b>probe-idle-tunnel</b>	Send dead peer detection (DPD) messages during idle traffic time between peers.
<b>threshold</b>	Specify the maximum number of unsuccessful dead peer detection (DPD) requests to be sent before the peer is considered unavailable. <ul style="list-style-type: none"> <li>• <b>Default:</b> 5</li> <li>• <b>Range:</b> 1 through 5</li> </ul>

## Required Privilege Level

security—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.5. Support for the `optimized` and `probe-idle-tunnel` options added in Junos OS Release 12.1X46-D10.

### RELATED DOCUMENTATION

[Understanding AutoVPN](#)

[IPsec VPN Overview](#)

# default-chap-secret

## IN THIS SECTION

- [Syntax | 107](#)
- [Hierarchy Level | 108](#)
- [Description | 108](#)
- [Default | 108](#)
- [Required Privilege Level | 108](#)
- [Release Information | 108](#)

## Syntax

```
default-chap-secret name;
```

## Hierarchy Level

```
[edit interfaces interface-name ppp-options chap],  
[edit interfaces interface-name unit logical-unit-number ppp-options chap],  
[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-  
options chap]
```

## Description

Define the default CHAP secret to be used when no matching CHAP access profile exists.

For ATM2 IQ interfaces only, you can configure a default CHAP secret on the logical interface unit if the logical interface is configured with one of the following PPP over ATM encapsulation types:

- atm-ppp-llc—PPP over AAL5 LLC encapsulation.
- atm-ppp-vc-mux—PPP over AAL5 multiplex encapsulation.

## Default

If you do not include the `default-chap-secret` statement in the configuration, and an interface receives a CHAP challenge or response from a peer that is not in the applied access profile, the link is immediately dropped.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.0.

## RELATED DOCUMENTATION

[PPP Challenge Handshake Authentication Protocol | 44](#)  
[access-profile](#)

# default-pap-password

## IN THIS SECTION

- [Syntax | 109](#)
- [Hierarchy Level | 109](#)
- [Description | 109](#)
- [Required Privilege Level | 110](#)
- [Release Information | 110](#)

## Syntax

```
default-pap-password password;
```

## Hierarchy Level

```
[edit interfaces interface-name unit logical-unit-number ppp-options pap],  
[edit logical-systems logical-system-name interfaces interface-name unit logical-unit-number ppp-  
options pap]
```

## Description

For PAP authentication, the default PAP password.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.3.

### RELATED DOCUMENTATION

[PPP Password Authentication Protocol | 53](#)

[access-profile](#)

# dhcp-attributes (Address-Assignment Pools)

## IN THIS SECTION

- [Syntax | 110](#)
- [Hierarchy Level | 111](#)
- [Description | 112](#)
- [Options | 112](#)
- [Required Privilege Level | 116](#)
- [Release Information | 117](#)

## Syntax

```
dhcp-attributes {  
  boot-file filename;
```

```

boot-server (address | hostname);
dns-server [ ipv6-address ];
domain-name domain-name;
exclude-prefix-len exclude-prefix-length;
grace-period seconds;
maximum-lease-time seconds;
name-server [ server-list ];
netbios-node-type node-type;
option {
    [ (id-number option-type option-value)
      (id-number array option-type option-value) ];
}
option-match {
    option-82 {
        circuit-id value range named-range;
        remote-id value range named-range;
    }
}
preferred-lifetime seconds;
router [ router-address ];
server-identifier ip4-address;
sip-server-address [ ipv6-address ];
sip-server-domain-name domain-name;
t1-percentage percentage;
t1-renewal-time;
t2-percentage percentage;
t2-rebinding-time;
tftp-server address;
valid-lifetime seconds;
wins-server [ servers ];
}

```

## Hierarchy Level

```
[edit access address-assignment pool pool-name family family]
```



## Description

Configure DHCP attributes for the protocol family in a specific address pool. The attributes determine options and behaviors for the DHCP clients.

## Options

<b>boot-file</b>	<p>Set the boot file advertised to DHCP clients. After the client receives an IP address and the boot file location from the DHCP server, the client uses the boot image stored in the boot file to complete DHCP setup. This configuration is equivalent to DHCP option 67.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>filename</i>—Location of the boot file on the boot server. The filename can include a pathname.</li> </ul>
<b>boot-server</b>	<p>Configure the name of the boot server advertised to DHCP clients. The client uses a boot file located on the boot server to complete DHCP setup. This configuration is equivalent to DHCP option 66.</p> <ul style="list-style-type: none"> <li>• Values: <ul style="list-style-type: none"> <li>• <i>address</i>—IPv4 address of a boot server.</li> <li>• <i>hostname</i>—Fully qualified hostname of a boot server.</li> </ul> </li> </ul>
<b>dns-server</b>	<p>Specify a DNS server to which clients can send DNS queries. This is equivalent to DHCPv6 option 23. To specify multiple DNS servers, add multiple <code>dns-server</code> statements in order of preference.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ipv6-address</i>—IPv6 address of a DNS server.</li> </ul>
<b>domain-name</b>	<p>Configure the name of the domain in which clients search for a DHCP server host. This is the default domain name that is appended to hostnames that are not fully qualified. This is equivalent to DHCP option 15.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>domain-name</i>—Name of the domain.</li> </ul>
<b>exclude-prefix-len</b> <i>exclude-prefix-length</i>	<p>Specify the length of the IPv6 prefix to be excluded from the delegated prefix. Range: 1 through 128.</p>
<b>grace-period</b>	<p>Configure the amount of time that the client retains the address lease after the lease expires. The address cannot be reassigned to another client during the grace period.</p>

- **Values:** *seconds*—Number of seconds the lease is retained.
- **Range:** 0 through 4,294,967,295 seconds.
- **Default:** 0 (no grace period).

**maximum-lease-time**

Specify the maximum length of time, in seconds, that the lease is held for a client if the client does not renew the lease. This is equivalent to DHCP option 51. The *maximum-lease-time* is mutually exclusive with both the *preferred-lifetime* and the *valid-lifetime*, and cannot be configured with either timer.

- **Values:** *seconds*—Maximum number of seconds the lease can be held.
- **Range:** 30 through 4,294,967,295 seconds.
- **Default:** 86,400 (24 hours).

**name-server**

Configure one or more Domain Name System (DNS) name servers available to the client to resolve hostname-to-client mappings. This is equivalent to DHCP option 6.

- **Values:** *server-names*—IP addresses of the domain name servers, listed in order of preference.

**netbios-node-type**

Specify the NetBIOS node type. This is equivalent to DHCP option 46.

- **Values:** *node-type*—One of the following node types:
  - b-node—Broadcast node.
  - h-node—Hybrid node.
  - m-node—Mixed node.
  - p-node—Peer-to-peer node.

**option**

Specify user-defined options that are added to client packets. Starting in Junos OS Release 13.3, the *hex-string* option type was introduced.

- **Values:**
  - *array*—An option can include an array of option types.
  - *id-number*—Any whole number. The ID number is used to index the option and must be unique across a DHCP server.

- *option-type*—Any of the following types: byte, byte-stream, flag, hex-string, integer, ip-address, short, string, unsigned-integer, or unsigned-short.
- *option-value*—Value associated with an option. The option value must be compatible with the option type (for example, an On or Off value for a flag type).

<b>preferred-lifetime</b>	<p>Specify the length of time, in seconds, that the DHCPv6 server keeps the IPv6 prefix active. When the lifetime expires, the address is deprecated. If the <i>valid-lifetime</i> is also configured, the <i>preferred-lifetime</i> must be less than the <i>valid-lifetime</i>. The <i>preferred-lifetime</i> and the <i>maximum-lease-time</i> are mutually exclusive and cannot both be configured.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>seconds</i>—Number of seconds that the IPv6 prefix is active.</li> <li>• <b>Range:</b> 30 through 4,294,967,295 seconds.</li> <li>• <b>Default:</b> 86,400 (24 hours).</li> </ul>
<b>router</b>	<p>Specify one or more routers located on the client's subnet. This statement is the equivalent of DHCP option 3.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>router-address</i>—IP address of one or more routers.</li> </ul>
<b>server-identifier</b>	<p>Specify the IP address that is used as the source address the DHCP server includes in IP packets when communicating with clients. The address is included in the DHCP packet in option 54.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ipv4-address</i>—IP address.</li> </ul>
<b>sip-server-address</b>	<p>Specify a SIP outbound proxy server that DHCPv6 local server clients can use. This is equivalent to DHCPv6 option 22. To specify multiple servers, add multiple <i>sip-server-address</i> statements in order of preference.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ipv6-address</i>—IPv6 address of a SIP outbound proxy server.</li> </ul>
<b>sip-server-domain-name</b>	<p>Configure the domain name of the SIP outbound proxy server that DHCPv6 local server clients can use. This is equivalent to DHCPv6 option 21.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>domain-name</i>—Name of the domain.</li> </ul>
<b>t1-percentage</b>	<p>Specify a percentage of the <i>preferred-lifetime</i> value. After this percentage of the <i>preferred-lifetime</i> value elapses, the DHCPv4 or DHCPv6 client requests an extension on its lease from the originating DHCP local server. The <i>t1-percentage</i> is also referred to as the renewal time. The <i>t1-percentage</i> value must be less than the <i>t2-percentage</i> value. DHCPv4 server support was added in Junos OS Release 17.2.</p>

- **Values:** *percentage*—Percentage of the preferred-lifetime value.
- **Range:** 0 through 100.
- **Default:** If the t1-percentage value is not configured, the default is based on the preferred-lifetime value:
  - If the preferred-lifetime value is finite, the default is 50 percent of the preferred-lifetime value.
  - If the preferred-lifetime value is infinite, the default is also infinite.

#### t1-renewal-time

Specify the time (T1) at which the DHCPv4 or DHCPv6 client requests an extension (renewal) of the existing lease. This time is expressed as the number of seconds since the beginning of the lease. Using this statement to configure a duration in seconds is an alternative to using the t1-percentage statement.

- **Values:** *seconds*—Number of seconds.
- **Range:** 30 through 4,294,967,295 seconds.
- **Default:** 50 percent of the lease duration (preferred-lifetime).

#### t2-percentage

Specify a percentage of the preferred-lifetime value. After this percentage of the preferred-lifetime value elapses, the DHCPv4 or DHCPv6 client requests an extension on its lease from any available DHCPv4 or DHCPv6 server. The t2-percentage is also referred to as the rebinding time. The t2-percentage value must be greater than the t1-percentage value. DHCPv4 server support was added in Junos OS Release 17.2.

- **Values:** *percentage*—Percentage of the preferred-lifetime value.
- **Range:** 0 through 100.
- **Default:** Default: If the t2-percentage value is not configured, the default is based on the preferred-lifetime value:
  - If the preferred-lifetime value is finite, the default is 80 percent of the preferred-lifetime value.
  - When the preferred-lifetime value is infinite, the default is also infinite.

#### t2-rebinding-time

Specify the time (T2) at which the DHCPv4 or DHCPv6 client attempts to contact any DHCP server to request an extension (rebinding) of the existing lease. This time is expressed as the number of seconds since the beginning of the lease. Using this statement to configure a duration in seconds is an alternative to using the t2-percentage statement.

- **Values:** *seconds*—Number of seconds.
- **Range:** 30 through 4,294,967,295 seconds.
- **Default:** The default value depends on the client:
  - (DHCPv4 clients) 87.5 percent of the lease duration (*preferred-lifetime*).
  - (DHCPv6 clients) 80 percent of the lease duration (*preferred-lifetime*).

**tftp-server** Specify the Trivial File Transfer Protocol (TFTP) server that the client uses to obtain the client configuration file. This is equivalent to DHCP option 150.

- **Values:** *ip-address*—IP address of the TFTP server.

**valid-lifetime** Specify the length of time, in seconds, that the DHCPv6 server keeps the IPv6 prefix valid. When the lifetime expires, the address becomes invalid. If the *preferred-lifetime* is also configured, the *valid-lifetime* must be greater than the *preferred-lifetime*. The *valid-lifetime* and the *maximum-lease-time* are mutually exclusive and cannot both be configured.

- **Values:** *seconds*—Number of seconds that the IPv6 prefix is valid.
- **Range:** 30 through 4,294,967,295 seconds.
- **Default:** 86,400 (24 hours).

**wins-server** Specify one or more NetBIOS name servers (NBNS) that the client uses to resolve NetBIOS names. This is equivalent to DHCP option 44.

- **Values:** *ipv4-address*—IP address of each NetBIOS name server. Add them to the configuration in order of preference.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

`exclude-prefix-len` statement introduced in Junos OS Release 17.3 for MX Series.

### RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

*DHCP Client Attribute and Address Assignment*

*DHCP Lease Times for IP Addresses*

# encapsulation-overhead

## IN THIS SECTION

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

## Syntax

```
encapsulation-overhead bytes;
```

## Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the encapsulation overhead for class-of-service calculations.

## Options

*bytes*—The number of bytes used as encapsulation overhead for the session.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 8.3.

### RELATED DOCUMENTATION

| [Point-to-Point Protocol \(PPP\)](#) | 4

## exclude (RADIUS Attributes)

### IN THIS SECTION

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- [Hierarchy Level | 121](#)
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### Syntax

```
exclude {
    acc-aggr-cir-id-asc [ access-request | accounting-start | accounting-stop ];
    acc-aggr-cir-id-bin [ access-request | accounting-start | accounting-stop ];
    acc-loop-cir-id [ access-request | accounting-start | accounting-stop ];
    acc-loop-encap [ access-request | accounting-start | accounting-stop ];
    acc-loop-remote-id [ access-request | accounting-start | accounting-stop ];
    accounting-authentic [ accounting-off | accounting-on | accounting-start | accounting-stop ]
    accounting-delay-time [ accounting-off | accounting-on | accounting-start | accounting-
stop ];
    accounting-session-id access-request;
    accounting-terminate-cause accounting-off;
    acct-request-reason [ accounting-start | accounting-stop ];
    acct-tunnel-connection [ access-request | accounting-start | accounting-stop ];
    act-data-rate-dn [ access-request | accounting-start | accounting-stop ];
    act-data-rate-up [ access-request | accounting-start | accounting-stop ];
    act-interlv-delay-dn [ access-request | accounting-start | accounting-stop ];
    act-interlv-delay-up [ access-request | accounting-start | accounting-stop ];
    att-data-rate-dn [ access-request | accounting-start | accounting-stop ];
    att-data-rate-up [ access-request | accounting-start | accounting-stop ];
    called-station-id [ access-request | accounting-start | accounting-stop ];
    calling-station-id [ access-request | accounting-start | accounting-stop ];
    chargeable-user-identity access-request;
```



```

class [ accounting-start | accounting-stop ];
cos-shaping-rate [ accounting-start | accounting-stop ];
delegated-ipv6-prefix [ accounting-start | accounting-stop ];
dhcp-gi-address [ access-request | accounting-start | accounting-stop ];
dhcp-header access-request;
dhcp-mac-address [ access-request | accounting-start | accounting-stop ];
dhcp-options [ access-request | accounting-start | accounting-stop ];
dhcpv6-header access-request;
dhcpv6-options [ access-request | accounting-start | accounting-stop ];
downstream-calculated-qos-rate [ access-request | accounting-start | accounting-stop ];
dsl-forum-attributes [ access-request | accounting-start | accounting-stop ];
dsl-line-state [ access-request | accounting-start | accounting-stop ];
dsl-type [ access-request | accounting-start | accounting-stop ];
dynamic-iflset-name [ accounting-start | accounting-stop ];
event-timestamp [ accounting-off | accounting-on | accounting-start | accounting-stop ];
filter-id [ accounting-start | accounting-stop ];
first-relay-ipv4-address [ access-request | accounting-start | accounting-stop ];
first-relay-ipv6-address [ access-request | accounting-start | accounting-stop ];
framed-interface-id [ access-request | accounting-start | accounting-stop ];
framed-ip-address [ access-request | accounting-start | accounting-stop ];
framed-ip-netmask [ access-request | accounting-start | accounting-stop ];
framed-ip-route [ accounting-start | accounting-stop ];
framed-ipv6-address [ access-request | accounting-start | accounting-stop ];
framed-ipv6-pool [ accounting-start | accounting-stop ];
framed-ipv6-prefix [ accounting-start | accounting-stop ];
framed-ipv6-route [ accounting-start | accounting-stop ];
framed-pool [ accounting-start | accounting-stop ]; input-ipv6-gigawords accounting-stop;
input-filter [ accounting-start | accounting-stop ];
input-gigapackets accounting-stop;
input-gigawords accounting-stop;
input-ipv6-octets accounting-stop;
input-ipv6-packets accounting-stop;
interface-description [ access-request | accounting-start | accounting-stop ];
l2c-downstream-data [ access-request | accounting-start | accounting-stop ];
l2c-upstream-data [ access-request | accounting-start | accounting-stop ];
l2tp-rx-connect-speed [ access-request | accounting-start | accounting-stop ];
l2tp-tx-connect-speed [ access-request | accounting-start | accounting-stop ];
max-data-rate-dn [ access-request | accounting-start | accounting-stop ];
max-data-rate-up [ access-request | accounting-start | accounting-stop ];
max-interlv-delay-dn [ access-request | accounting-start | accounting-stop ];
max-interlv-delay-up [ access-request | accounting-start | accounting-stop ];
min-data-rate-dn [ access-request | accounting-start | accounting-stop ];
min-data-rate-up [ access-request | accounting-start | accounting-stop ];

```

```

min-lp-data-rate-dn [ access-request | accounting-start | accounting-stop ];
min-lp-data-rate-up [ access-request | accounting-start | accounting-stop ];
nas-identifier [ access-request | accounting-off | accounting-on | accounting-start |
accounting-stop ];
nas-port [ access-request | accounting-start | accounting-stop ];
nas-port-id [ access-request | accounting-start | accounting-stop ];
nas-port-type [ access-request | accounting-start | accounting-stop ];
output-filter [ accounting-start | accounting-stop ];
output-gigapackets accounting-stop;
output-gigawords accounting-stop;
output-ipv6-gigawords accounting-stop;
output-ipv6-octets accounting-stop;
output-ipv6-packets accounting-stop;
pppoe-description [ access-request | accounting-start | accounting-stop ];
standard-attribute number {
    packet-type [ access-request | accounting-off | accounting-on | accounting-start |
accounting-stop ];
}
tunnel-assignment-id [ access-request | accounting-start | accounting-stop ];
tunnel-client-auth-id [ access-request | accounting-start | accounting-stop ];
tunnel-client-endpoint [ access-request | accounting-start | accounting-stop ];
tunnel-medium-type [ access-request | accounting-start | accounting-stop ];
tunnel-server-auth-id [ access-request | accounting-start | accounting-stop ];
tunnel-server-endpoint [ access-request | accounting-start | accounting-stop ];
tunnel-type [ access-request | accounting-start | accounting-stop ];
upstream-calculated-qos-rate [ access-request | accounting-start | accounting-stop ];
vendor-id id-number {
    vendor-attribute vsa-number {
        packet-type [ access-request | accounting-off | accounting-on | accounting-start |
accounting-stop ];
    }
}
virtual-router [ access-request | accounting-start | accounting-stop ];
}

```

## Hierarchy Level

```
[edit access profile profile-name radius attributes]
```

## Description

Configure the router or switch to exclude the specified attributes from being sent in the specified type of RADIUS message. Exclusion can be useful, for example, for attributes that do not change values over the lifetime of a subscriber. By not sending these attributes, you reduce the packet size without losing information. Contrast this behavior with that provided by the `ignore` statement.

You can specify attribute exclusion for multiple RADIUS message types by enclosing the message types, separated by spaces, within brackets ([ ]). You do not need brackets when specifying a single message type.

Starting in Junos OS Release 18.1R1, you can specify standard RADIUS attributes with the attribute number. You can specify VSAs with the IANA-assigned vendor ID and the VSA number. With this flexible configuration method, you can configure any standard attribute and VSA supported by your platform to be excluded. The configuration has no effect if you configure unsupported attributes, vendors, and VSAs.

The legacy method allows you to configure only those attributes and VSAs for which the statement syntax includes a specific option. Consequently, you can use the legacy method to exclude only a subset of all attributes that can be received in Access-Accept messages.

Not all attributes are available in all types of RADIUS messages.

**NOTE:** If you exclude an attribute from Acct-Off messages, the attributes are then excluded from Interim-Acct messages.

**NOTE:** VSAs with dedicated option names include Juniper Networks (IANA vendor ID 4874) and DSL Forum (vendor ID 3561) VSAs.

## Options

RADIUS attribute—RADIUS standard attribute or VSA:

- `acc-aggr-cir-id-asc`—Exclude Juniper Networks VSA 26-112, Acc-Aggr-Cir-Id-Asc.
- `acc-aggr-cir-id-bin`—Exclude Juniper Networks VSA 26-111, Acc-Aggr-Cir-Id-Bin.
- `acc-loop-cir-id`—Exclude Juniper Networks VSA 26-110, Acc-Loop-Cir-Id.

- acc-loop-encap—Exclude Juniper Networks VSA 26-183, Acc-Loop-Encap.
- acc-loop-remote-id—Exclude Juniper Networks VSA 26-182, Acc-Loop-Remote-Id.
- accounting-authentic—Exclude RADIUS attribute 45, Acct-Authentic.
- accounting-delay-time—Exclude RADIUS attribute 41, Acct-Delay-Time.
- accounting-session-id—Exclude RADIUS attribute 44, Acct-Session-Id.
- accounting-terminate-cause—Exclude RADIUS attribute 49, Acct-Terminate-Cause.
- acct-request-reason—Exclude Juniper Networks VSA 26-210, Acct-Request-Reason.
- acct-tunnel-connection—Exclude RADIUS attribute 68, Acct-Tunnel-Connection.
- act-data-rate-dn—Exclude Juniper Networks VSA 26-114, Act-Data-Rate-Dn.
- act-data-rate-up—Exclude Juniper Networks VSA 26-113, Act-Data-Rate-Up.
- act-interlv-delay-dn—Exclude Juniper Networks VSA 26-126, Act-Interlv-Delay-Dn.
- act-interlv-delay-up—Exclude Juniper Networks VSA 26-124, Act-Interlv-Delay-Up.
- att-data-rate-dn—Exclude Juniper Networks VSA 26-118, Att-Data-Rate-Dn.
- att-data-rate-up—Exclude Juniper Networks VSA 26-117, Att-Data-Rate-Up.
- called-station-id—Exclude RADIUS attribute 30, Called-Station-Id.
- calling-station-id—Exclude RADIUS attribute 31, Calling-Station-Id.
- chargeable-user-identity—Exclude RADIUS attribute 89, Chargeable-User-Identity.
- class—Exclude RADIUS attribute 25, Class.
- cos-shaping-rate—Exclude Juniper Networks VSA 26-177, Cos-Shaping-Rate.
- delegated-ipv6-prefix—Exclude RADIUS attribute 123, Delegated-IPv6-Prefix.
- dhcp-gi-address—Exclude Juniper Networks VSA 26-57, DHCP-GI-Address.
- dhcp-header—Exclude Juniper Networks VSA 26-208, DHCP-Header.
- dhcp-mac-address—Exclude Juniper Networks VSA 26-56, DHCP-MAC-Address.
- dhcp-options—Exclude Juniper Networks VSA 26-55, DHCP-Options.
- dhcpv6-header—Exclude Juniper Networks VSA 26-209, DHCPv6-Header.
- dhcpv6-options—Exclude Juniper Networks VSA 26-207, DHCPv6-Options.

- `dynamic-iflset-name`—Exclude Juniper Networks VSA 26-130, Qos-Set-Name.
- `downstream-calculated-qos-rate`—Exclude Juniper Networks VSA 26-141.
- `dsl-forum-attributes`—Exclude DSL Forum VSA (vendor ID 3561) as described in RFC 4679, *DSL Forum Vendor-Specific RADIUS Attributes*.
- `dsl-line-state`—Exclude Juniper Networks VSA 26-127, DSL-Line-State.
- `dsl-type`—Exclude Juniper Networks VSA 26-128, DSL-Type.
- `event-timestamp`—Exclude RADIUS attribute 55, Event-Timestamp.
- `filter-id`—Exclude RADIUS attribute 11, Filter-Id.
- `first-relay-ipv4-address` —Exclude Juniper Networks VSA 26-189, DHCP-First-Relay-IPv4-Address.
- `first-relay-ipv6-address` —Exclude Juniper Networks VSA 26-190, DHCP-First-Relay-IPv6-Address.
- `framed-interface-id`—Exclude RADIUS attribute 96, Framed-Interface-ID.
- `framed-ip-address`—Exclude RADIUS attribute 8, Framed-IP-Address.
- `framed-ip-netmask`—Exclude RADIUS attribute 9, Framed-IP-Netmask.
- `framed-ip-route`—Exclude RADIUS attribute 22, Framed-Route.
- `framed-ipv6-address`—Exclude RADIUS attribute 168, Framed-IPv6-Address.
- `framed-ipv6-pool`—Exclude RADIUS attribute 100, Framed-IPv6-Pool.
- `framed-ipv6-prefix`—Exclude RADIUS attribute 97, Framed-IPv6-Prefix.
- `framed-ipv6-route`—Exclude RADIUS attribute 99, Framed-IPv6-Route.
- `framed-pool`—Exclude RADIUS attribute 88, Framed-Pool.
- `input-filter`—Exclude Juniper Networks VSA 26-10, Ingress-Policy-Name.
- `input-gigapackets`—Exclude Juniper Networks VSA 26-42, Acct-Input-Gigapackets.
- `input-gigawords`—Exclude RADIUS attribute 52, Acct-Input-Gigawords.
- `input-ipv6-gigawords`—Exclude Juniper Networks VSA 26-155, Acct-Input-IPv6-Gigawords.
- `input-ipv6-octets`—Exclude Juniper Networks VSA 26-151, Acct-Input-IPv6-Octets.
- `input-ipv6-packets`—Exclude Juniper Networks VSA 26-153, Acct-Input-IPv6-Packets.
- `interface-description`—Exclude Juniper Networks VSA 26-53, Interface-Desc.

- l2c-downstream-data—Exclude Juniper Networks VSA 26-93, L2C-Down-Stream-Data.
- l2c-upstream-data—Exclude Juniper Networks VSA 26-92, L2C-Up-Stream-Data.
- l2tp-rx-connect-speed—Exclude Juniper Networks VSA 26-163, Rx-Connect-Speed.
- l2tp-tx-connect-speed—Exclude Juniper Networks VSA 26-162, Tx-Connect-Speed.
- max-data-rate-dn—Exclude Juniper Networks VSA 26-120, Max-Data-Rate-Dn.
- max-data-rate-up—Exclude Juniper Networks VSA 26-119, Max-Data-Rate-Up.
- max-interlv-delay-dn—Exclude Juniper Networks VSA 26-125, Max-Interlv-Delay-Dn.
- max-interlv-delay-up—Exclude Juniper Networks VSA 26-123, Max-Interlv-Delay-Up.
- min-data-rate-dn—Exclude Juniper Networks VSA 26-116, Min-Data-Rate-Dn.
- min-data-rate-up—Exclude Juniper Networks VSA 26-115, Min-Data-Rate-Up.
- min-lp-data-rate-dn—Exclude Juniper Networks VSA 26-122, Min-Lp-Data-Rate-Dn.
- min-lp-data-rate-up—Exclude Juniper Networks VSA 26-121, Min-Lp-Data-Rate-Up.
- nas-identifier—Exclude RADIUS attribute 32, NAS-Identifier.
- nas-port—Exclude RADIUS attribute 5, NAS-Port.
- nas-port-id—Exclude RADIUS attribute 87, NAS-Port-Id.
- nas-port-type—Exclude RADIUS attribute 61, NAS-Port-Type.
- output-filter—Exclude Juniper Networks VSA 26-11, Egress-Policy-Name.
- output-gigapackets—Exclude Juniper Networks VSA 26-43, Acct-Output-Gigapackets.
- output-gigawords—Exclude RADIUS attribute 53, Acct-Output-Gigawords.
- output-ipv6-gigawords—Exclude Juniper Networks VSA 26-156, Acct-Output-IPv6-Gigawords.
- output-ipv6-octets—Exclude Juniper Networks VSA 26-152, Acct-Output-IPv6-Octets.
- output-ipv6-packets—Exclude Juniper Networks VSA 26-154, Acct-Output-IPv6-Packets.
- packet-type—Specify the RADIUS message type to exclude; term required when excluding a standard attribute or VSA by number rather than name. You can enclose multiple values in square brackets to specify a list of message types. Message types include Access-Request, Accounting-Off, Accounting-Off, Accounting-Start, and Accounting-Stop.
- pppoe-description—Exclude Juniper Networks VSA 26-24, PPPoE-Description.

- `standard-attribute number`—RADIUS standard attribute number supported by your platform. If you configure an unsupported attribute, that configuration has no effect. When you use this option, you must use the `packet-type` term to specify the message from which the attribute is excluded.
- `tunnel-assignment-id`—Exclude RADIUS attribute 82, Tunnel-Assignment-ID.
- `tunnel-client-auth-id`—Exclude RADIUS attribute 90, Tunnel-Client-Auth-ID.
- `tunnel-client-endpoint`—Exclude RADIUS attribute 66, Tunnel-Client-Endpoint.
- `tunnel-medium-type`—Exclude RADIUS attribute 65, Tunnel-Medium-Type.
- `tunnel-server-auth-id`—Exclude RADIUS attribute 91, Tunnel-Server-Auth-ID.
- `tunnel-server-endpoint`—Exclude RADIUS attribute 67, Tunnel-Server-Endpoint.
- `tunnel-type`—Exclude RADIUS attribute 64, Tunnel-Type.
- `upstream-calculated-qos-rate`—Exclude Juniper Networks VSA 26-142
- `vendor-attribute vsa-number`—Number identifying a VSA belonging to the specified vendor; both must be supported by your platform. If you configure an unsupported VSA, that configuration has no effect. When you use this option, you must use the `packet-type` term to specify the message from which the attribute is excluded.
- `vendor-id id-number`—IANA vendor ID supported by your platform. If you configure an unsupported vendor ID, that configuration has no effect.
- `virtual-router`—Exclude Juniper Networks VSA 26-1.

RADIUS message type:

- `access-request`—RADIUS Access-Request messages.
- `accounting-off`—RADIUS Accounting-Off messages.
- `accounting-on`—RADIUS Accounting-On messages.
- `accounting-start`—RADIUS Accounting-Start messages.
- `accounting-stop`—RADIUS Accounting-Stop messages.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 9.1.

downstream-calculated-qos-rate, dsl-forum-attributes, and upstream-calculated-qos-rate options added in Junos OS Release 11.4.

cos-shaping-rate and filter-id options added in Junos OS Release 13.2.

pppoe-description option added in Junos OS Release 14.2.

virtual-router option added in Junos OS Release 15.1.

first-relay-ipv4-address and first-relay-ipv6-address options added in Junos OS Release 16.1.

acc-loop-encap and acc-loop-remote-id options added in Junos OS Release 16.1R4.

access-request option support for all tunnel attributes added in Junos OS Release 15.1R7, 16.1R5, 16.2R2, 17.1R2, 17.2R2, and 17.3R1 for MX Series.

packet-type, standard-attribute, vendor-attribute, and vendor-id options added in Junos OS Release 18.1R1.

## RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*Standard and Vendor-Specific RADIUS Attributes*

# framed-pool

## IN THIS SECTION

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- [Options | 128](#)
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## Syntax

```
framed-pool framed-pool;
```

## Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the address pool.

## Options

*framed-pool*—References a configured address pool.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

# group-profile (Group Profile)

## IN THIS SECTION

- [Syntax](#) | 129
- [Hierarchy Level](#) | 130
- [Description](#) | 130
- [Options](#) | 131
- [Required Privilege Level](#) | 131
- [Release Information](#) | 131

## Syntax

```
group-profile profile-name {  
  l2tp {  
    interface-id interface-id;  
    lcp-renegotiation;  
    local-chap;  
    maximum-sessions-per-tunnel number;  
  }  
  ppp {  
    cell-overhead;  
    encapsulation-overhead bytes;  
    framed-pool pool-id;
```

```

idle-timeout seconds;
interface-id interface-id;
keepalive seconds;
ppp-options {
    aaa-options aaa-options-name;
    chap;
    ignore-magic-number-mismatch;
    initiate-ncp (ip | ipv6 | dual-stack-passive)
    ipcp-suggest-dns-option;
    mru;
    mtu;
    pap;
    peer-ip-address-optional;
}
primary-dns primary-dns;
primary-wins primary-wins;
secondary-dns secondary-dns;
secondary-wins secondary-wins;
}
}

```

## Hierarchy Level

[edit access]

## Description

Configure the group profile.

**NOTE:** Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.

## Options

*profile-name*—Name assigned to the group profile.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

# host (Address-Assignment Pools)

### IN THIS SECTION

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

- Required Privilege Level | 133
- Release Information | 133

## Syntax

```
host hostname {
    hardware-address mac-address;
    ip-address ip-address;
}
```

## Hierarchy Level

```
[edit access address-assignment pool pool-name family (inet | inet6)]
```

## Description

Configure a static binding for the specified client.

## Options

<i>hostname</i>	Name of the client.
<b>hardware-address</b> <i>mac-address</i>	Specify the MAC address of the client. This is the hardware address that identifies the client on the network. <ul style="list-style-type: none"> <li>• <i>mac-address</i>—MAC address of the client.</li> </ul>
<b>ip-address</b> <i>ip-address</i>	Specify the reserved IP address assigned to the client.

- *ip-address*—IP version 4 (IPv4) address.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

| *Address-Assignment Pools for Subscriber Management*

# idle-timeout (Access)

#### IN THIS SECTION

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

## Syntax

```
idle-timeout seconds;
```

## Hierarchy Level

```
[edit access group-profile profile-nameppp ppp],  
[edit access profile profile-name client client-nameppp ]
```

## Description

Configure the idle timeout for a user. The router might consider a PPP session to be idle because of the following reasons:

- There is no ingress traffic on the PPP session.
- There is no egress traffic.
- There is neither ingress or egress traffic on the PPP session.
- There is no ingress or egress PPP control traffic. This is applicable only if keepalives are enabled.

## Options

*seconds*—Number of seconds a user can remain idle before the session is terminated.

- **Range:** 0 through 4,294,967,295 seconds
- **Default:** 0

**NOTE:** The [edit access] hierarchy is not available on QFabric systems.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

*L2TP LNS Inline Service Interfaces*

# ike (Access Profile)

### IN THIS SECTION

- [Syntax | 135](#)
- [Hierarchy Level | 136](#)
- [Description | 136](#)
- [Options | 136](#)
- [Required Privilege Level | 137](#)
- [Release Information | 138](#)

## Syntax

```
ike {  
  allowed-proxy-pair {
```



```

        remote remote-proxy-address local local-proxy-address;
    }
    dead-peer-detection{
        interval seconds
        threshold number
    }
    ike-policy policy-name;
    initiate-dead-peer-detection;
    interface-id string-value;
    ipsec-policy ipsec-policy;
    pre-shared-key (ascii-text character-string | hexadecimal hexadecimal-digits);
    reverse-route
}

```

## Hierarchy Level

```
[edit access profile profile-name client client-name]
```

## Description

Configure an IKE access profile.

The remaining statements are explained below.

**NOTE:** This statement is not supported on MX Series routers.

## Options

**allowed-proxy-pair** Specify the network address of the local and remote peer associated with an IKE access profile.

- Values:
  - local *local-proxy-address*—Network address of the local peer. Default: 0.0.0.0
  - remote *remote-proxy-address*—Network address of the remote peer. Default: 0.0.0.0

**ike-policy *policy-name***

Specify the IKE policy used to authenticate dynamic peers during IKE negotiation.

- Values:
  - *policy-name*—The name of an IKE policy configured at the [edit services ipsec-vpn ike policy *policy-name*] hierarchy level. The IKE policy defines either the local digital certificate or the pre-shared key used for IKE authentication with dynamic peers.

**initiate-dead-peer-detection**

Detect inactive peers on dynamic IPsec tunnels.

**pre-shared-key (ascii-text *character-string* | hexadecimal *hexadecimal-digits*);**

Configure the key used to authenticate a dynamic peer during IKE phase 1 negotiation. Specify the key in either ASCII or hexadecimal format.

- Values:
  - ascii-text *character-string*—Authentication key in ASCII format.
  - hexadecimal *hexadecimal-digits*—Authentication key in hexadecimal format.

**reverse-route**

Configure a reverse route for dynamic endpoint IPsec tunnels.

- **Values:** preference *metric-value*

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 7.4.

ike-policy statement introduced in Junos OS Release 8.2.

### RELATED DOCUMENTATION

[IKE Access Profiles | 41](#)

[Configuring Services Interfaces](#)

# immediate-update

## IN THIS SECTION

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

## Syntax

```
immediate-update;
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Configure the router or switch to send an Acct-Update message to the RADIUS accounting server on receipt of a response (for example, an ACK or timeout) to the Acct-Start message.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*RADIUS Accounting for Subscriber Access*

# interface-description-format

## IN THIS SECTION

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

## Syntax

```
interface-description-format {
    exclude-adapter;
    exclude-channel;
    exclude-sub-interface;
}
```

## Hierarchy Level

```
[edit access profile profile-name radius options]
```

## Description

Specify the information that is excluded from the interface description that the device passes to RADIUS for inclusion in the RADIUS attributes such as NAS-Port-ID (87) or Calling-Station-ID (31).

The default format for nonchannelized interfaces is as follows:

```
interface-type slot/adapter/port.subinterface[:svlan-vlan]
```

For example, consider physical interface ge-1/2/0, with a subinterface of 100 and SVLAN identifier of 100. The interface description used in the NAS-Port-ID is ge-1/2/0.100:100. If you exclude the subinterface, the description becomes ge-1/2/0:100.

The default format for channelized interfaces is as follows:

```
interface-type slot/adapter/channel.subinterface[:svlan-vlan]
```

The channel information (logical port number) is determined by this formula:

Logical port number =  $100 + (\text{actual-port-number} \times 20) + \text{channel-number}$ .

For example, consider a channelized interface 3 on port 2 where the:

- Physical interface is xe-0/1/2:3.
- Subinterface is 4.

- SVLAN is 5.
- VLAN is 6.

Using the formula, the logical port number =  $100 + (2 \times 20) + 3 = 143$ . Consequently, the default interface description is xe-0/1/143.4-5.6. If you exclude the channel information, the description becomes xe-0/1/2.4-5.6.

## Options

<b>exclude-adapter</b>	—(Optional) Exclude the adapter from the interface description.
<b>exclude-channel</b>	(Optional) Exclude the channel information from the interface description.
<b>exclude-sub-interface</b>	—(Optional) Exclude the subinterface from the interface description.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

exclude-adapter and exclude-sub-interface options added in Junos OS Release 10.4.

exclude-channel option added in Junos OS Release 17.3R1.

## RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*Standard and Vendor-Specific RADIUS Attributes*

# interface-id

## IN THIS SECTION

- [Syntax | 142](#)
- [Hierarchy Level | 142](#)
- [Description | 142](#)
- [Options | 143](#)
- [Required Privilege Level | 143](#)
- [Release Information | 143](#)

## Syntax

```
interface-id interface-id;
```

## Hierarchy Level

```
[edit access group-profile profile-name l2tp],  
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ike],  
[edit access profile profile-name client client-name l2tp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the interface identifier.

## Options

*interface-id*—Identifier for the interface representing a Layer 2 Tunneling Protocol (L2TP) session configured at the [edit interfaces *interface-name* unit *local-unit-number* dial-options] hierarchy level. For more information about the interface ID, see [Services Interface Naming Overview](#).

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

[Layer 2 Tunneling Protocol \(L2TP\)](#) | 21

[L2TP LNS Inline Service Interfaces](#)

[IKE Access Profiles](#) | 41

# keepalive

### IN THIS SECTION

● [Syntax](#) | 144

● [Hierarchy Level](#) | 144

● [Description](#) | 144



- Options | 144
- Required Privilege Level | 145
- Release Information | 145

## Syntax

```
keepalive seconds;
```

## Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the keepalive interval for an L2TP tunnel.

## Options

*seconds*—Time period that must elapse before the Junos OS checks the status of the Point-to-Point Protocol (PPP) session by sending an echo request to the peer.

For L2TP on MX Series routers, the minimum recommended interval is 30 seconds. A value of 0 disables generation of keepalive messages from the LNS.

- **Range:** 0 through 32,767 seconds
- **Default:** 30 seconds

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

# keepalive-retries

### IN THIS SECTION

- [Syntax | 145](#)
- [Hierarchy Level | 146](#)
- [Description | 146](#)
- [Options | 146](#)
- [Required Privilege Level | 146](#)
- [Release Information | 146](#)

## Syntax

```
keepalive-retries number-of-retries;
```

## Hierarchy Level

```
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the number of retry attempts for checking the keepalive status of a Point-to-Point (PPP) protocol session. Configure this setting to reduce the detection time for PPP client session timeouts or failures if you have configured the keepalive timeout interval (using the `keepalive` statement).

## Options

*number-of-retries*—The maximum number of retries the L2TP network server (LNS) attempts by sending LCP echo requests to the peer to check the keepalive status of the PPP session. If there is no response from the PPP client within the specified number of retries, the PPP session is considered to have timed out.

- **Range:** 3 through 32,767 times
- **Default:** 10 times

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 10.4.

## RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

*keepalive*

# I2tp (Group Profile)

## IN THIS SECTION

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

## Syntax

```
l2tp {  
    interface-id interface-id;  
    lcp-renegotiation;  
    local-chap;  
    maximum-sessions-per-tunnel number;  
}
```

## Hierarchy Level

```
[edit access group-profile profile-name]
```

## Description

Configure the Layer 2 Tunneling Protocol for a group profile.

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

# I2tp (Profile)

### IN THIS SECTION

- [Syntax | 149](#)
- [Hierarchy Level | 149](#)
- [Description | 149](#)
- [Options | 150](#)

- Required Privilege Level | 153
- Release Information | 153

## Syntax

```
l2tp {
    interface-id interface-id;
    lcp-renegotiation;
    local-chap;
    maximum-sessions number;
    maximum-sessions-per-tunnel number;
    multilink {
        drop-timeout milliseconds;
        fragment-threshold bytes;
    }
    override-result-code session-out-of-resource;
    ppp-authentication (chap | pap);
    ppp-profile profile-name;
    sessions-limit-group;
    service-profile profile-name(parameter)&profile-name;
    shared-secret shared-secret;
}
```

## Hierarchy Level

```
[edit access profile profile-name client client-name]
```

## Description

Configure the L2TP properties for a profile.

**NOTE:** Only the `interface-id`, `lcp-renegotiation`, `maximum-sessions`, `maximum-sessions-per-tunnel`, `sessions-limit-group` and `shared-secret` statements are supported for L2TP LNS on MX Series routers.

## Options

<b>interface-id</b>	<p>Configure the interface identifier.</p> <ul style="list-style-type: none"> <li>Values: <ul style="list-style-type: none"> <li><i>interface-id</i>—Identifier for the interface representing a Layer 2 Tunneling Protocol (L2TP) session configured at the <code>[edit interfaces <i>interface-name</i> unit <i>local-unit-number</i> dial-options]</code> hierarchy level. For more information about the interface ID, see <a href="#">Services Interface Naming Overview</a>.</li> </ul> </li> </ul>
<b>lcp-renegotiation</b>	<p>Configure the L2TP network server (LNS) so it renegotiates the link control protocol (LCP) with the PPP client. When LCP renegotiation is disabled, LNS uses the pre-negotiated LCP parameters between the L2TP access concentrator (LAC) and PPP client to set up the session. When LCP renegotiation is enabled, authentication is also renegotiated.</p> <p><b>NOTE:</b> This statement is not supported at the <code>[edit access group-profile l2tp]</code> hierarchy level for L2TP LNS on MX Series routers.</p>
<b>local-chap</b>	<p>Configure the Junos OS so that the LNS ignores proxy authentication attribute-value pairs (AVPs) from the L2TP access concentrator (LAC) and reauthenticates the PPP client using a Challenge Handshake Authentication Protocol (CHAP) challenge. When you do this, the LNS directly authenticates the PPP client.</p> <p><b>NOTE:</b> This statement is not supported for L2TP LNS on MX Series routers.</p>
<b>maximum-sessions</b>	<p>Specify the maximum number of L2TP sessions for the chassis, all tunnels, a tunnel group, a session limit group, or a client.</p> <ul style="list-style-type: none"> <li>Values:</li> </ul>

- *number*—Number of sessions allowed.
- Range: (Chassis, tunnel group, session limit group, or client) 1 through the default maximum chassis limit
- Range: (Tunnel) 1 through 65,536

#### maximum-sessions-per-tunnel

Configure the maximum sessions for a Layer 2 tunnel.

**NOTE:** This statement is not supported at the [edit access group-profile l2tp] hierarchy level for L2TP LNS on MX Series routers.

- Values:
  - *number*—Maximum number of sessions for a Layer 2 tunnel.

#### "multilink" on page 158

Configure Multilink PPP for Layer 2 Tunneling Protocol (L2TP).

The options for this statement are explained separately. Click the linked statement for details.

#### override-result-code

Configure the LNS to override result codes in Call-Disconnect-Notify (CDN) messages.

- Values:
  - session-out-of-resource—Override result codes 4 and 5 with result code 2. These result codes indicate that the number of L2TP sessions have reached the configured maximum value and the LNS can support no more sessions. When the LAC receives the code, it fails over to another LNS to establish subsequent sessions. Some third-party LACs respond only to result code 2.

#### ppp-authentication

(T Series only) Configure PPP authentication.

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.

- Values:
  - chap—Challenge Handshake Authentication Protocol.
  - pap—Password Authentication Protocol.



**ppp-profile** (M Series, T Series only) Specify the profile used to validate PPP session requests through L2TP tunnels.

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.

- **Values:** *profile-name*—Identifier for the PPP profile.

**sessions-limit-group** (MX Series only) Starting in Junos OS Release 16.1, specify in an L2TP access profile the session limit group to which a client is assigned by the profile.

- **Values:** *limit-group-name*—Identifier of the session-limit group to which a client is assigned.

**service-profile** Configure one or more dynamic service profiles to be applied to subscriber sessions at activation for all subscribers in the specified tunnel group or on the specified LAC. Services are typically applied to L2TP sessions with RADIUS VSAs or CoA requests. In multivendor environments, you might use only standard attributes to simplify management of multiple vendor VSAs. This statement enables you to apply services without using an external authority such as RADIUS. The locally configured list of services (service profiles) serves as local authorization that is applied by authd during client session activation. This list of services is subject to the same validation and processing as services originating from an external authority, such as RADIUS.

You can optionally specify parameters that are passed to the corresponding service when it is activated for the session. The parameter might override values configured in the profile itself, such as a downstream shaping rate for a CoS service. This enables you to use the same service profile for multiple situations with different requirements, or to modify a previously applied value for a service.

You can still use RADIUS VSAs or CoA requests together with the service profiles. If services are sourced from an external authority as authorization during authentication or during subscriber session provisioning (activation), the services from the external authority take strict priority over those in the local configuration. If a service applied with RADIUS is the same as a service applied with a service profile in the CLI, but with different parameters, the RADIUS service is applied with a new session ID and takes precedence over the earlier service profile.

When service profiles are configured on a LAC client and on a tunnel group that uses that LAC client, the LAC configuration overrides the tunnel group configuration. Only the service profile configured on the LAC client is applied to subscribers in the tunnel group.

- Values:
  - *profile-name*—Name of a dynamic service profile that defines a service to be applied to L2TP subscriber sessions. You can specify one or more service profiles, separated by an ampersand (&).
  - *parameter*—(Optional) Value to be passed to the service when it is activated on the subscriber session.

**shared-secret**      Configure the shared secret.

- Values:
  - *shared-secret*—Shared secret key for authenticating the peer.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

*L2TP for Subscriber Access Overview*

# lcp-renegotiation

## IN THIS SECTION

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

## Syntax

```
lcp-renegotiation;
```

## Hierarchy Level

```
[edit access group-profile profile-name l2tp],  
[edit access profile profile-name client client-name l2tp]
```

## Description

Configure the L2TP network server (LNS) so it renegotiates the link control protocol (LCP) with the PPP client. When LCP renegotiation is disabled, LNS uses the pre-negotiated LCP parameters between the L2TP access concentrator (LAC) and PPP client to set up the session. When LCP renegotiation is enabled, authentication is also renegotiated.

**NOTE:** This statement is not supported at the `[edit access group-profile l2tp]` hierarchy level for L2TP LNS on MX Series routers.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

# local-chap

### IN THIS SECTION

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

## Syntax

```
local-chap;
```

## Hierarchy Level

```
[edit access group-profile profile-name l2tp],  
[edit access profile profile-name client client-name l2tp]
```

## Description

Configure the Junos OS so that the LNS ignores proxy authentication attribute-value pairs (AVPs) from the L2TP access concentrator (LAC) and reauthenticates the PPP client using a Challenge Handshake Authentication Protocol (CHAP) challenge. When you do this, the LNS directly authenticates the PPP client.

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

| [Layer 2 Tunneling Protocol \(L2TP\)](#) | [21](#)

# maximum-sessions-per-tunnel

## IN THIS SECTION

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

## Syntax

```
maximum-sessions-per-tunnel number;
```

## Hierarchy Level

```
[edit access group-profile l2tp],  
[edit access profile profile-name client client-name l2tp]
```

## Description

Configure the maximum sessions for a Layer 2 tunnel.

**NOTE:** This statement is not supported at the `[edit access group-profile l2tp]` hierarchy level for L2TP LNS on MX Series routers.

## Options

*number*—Maximum number of sessions for a Layer 2 tunnel.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

# multilink

## IN THIS SECTION

● [Syntax | 159](#)

- Hierarchy Level | 159
- Description | 159
- Options | 160
- Required Privilege Level | 160
- Release Information | 160

## Syntax

```
multilink {  
    drop-timeout milliseconds;  
    fragment-threshold bytes;  
}
```

## Hierarchy Level

```
[edit access profile profile-name client client-name l2tp]
```

## Description

Configure Multilink PPP for Layer 2 Tunneling Protocol (L2TP).

**NOTE:** This statement is not supported for L2TP LNS on MX Series routers.



## Options

**drop-timeout** (M Series, MX Series, PTX Series, T Series only) Configure the drop timeout for a multilink bundle.

- Values:
  - *milliseconds*—Number of milliseconds for the timeout that is associated with the first fragment on the reassembly queue. If the timeout expires before all the fragments have been collected, the fragments at the beginning of the reassembly queue are dropped. If the drop timeout is not specified, the Junos OS holds on to the fragments. (Fragments may still be dropped if the multilink reassembly algorithm determines that another fragment belonging to the packet on a reassembly queue has been lost.)

**fragment-threshold** (M Series, MX Series, PTX Series, T Series only) Configure the fragmentation threshold for a multilink bundle.

- Values:
  - *bytes*—The maximum number of bytes in a packet. If a packet exceeds the fragmentation threshold, the Junos OS fragments it into two or more multilink fragments.

## Required Privilege Level

interface—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

# nas-port-extended-format

## IN THIS SECTION

- [Syntax | 161](#)
- [Hierarchy Level | 162](#)
- [Description | 162](#)
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## Syntax

```
nas-port-extended-format {  
    adapter-width bits;  
    ae-width bits;  
    atm {  
        adapter-width bits;  
        port-width bits;  
        slot-width bits;  
        vci-width bits;  
        vpi-width bits;  
    }  
    port-width bits;  
    pw-width bits;  
    slot-width bits;  
    stacked-vlan-width bits;  
    vlan-width bits;  
}
```

## Hierarchy Level

```
[edit access profile profile-name radius options]
```

## Description

Configure the RADIUS client to use the extended format for RADIUS attribute 5 (NAS-Port) and specify the width in bits of the fields in the NAS-Port attribute.

The NAS-Port attribute specifies the physical port number of the NAS that is authenticating the user, and is formed by a combination of the physical port's slot number, port number, adapter number, VLAN ID, and S-VLAN ID. The NAS-Port extended format specifies the number of bits (bit width) for each field in the NAS-Port attribute: slot, adapter, port, aggregated, Ethernet, VLAN, and S-VLAN.

**NOTE:** The combined total of the widths of all fields for a subscriber must not exceed 32 bits, or the configuration fails. The router may truncate the values of individual fields depending on the bit width you specify.

## Options

adapter-width *width*—Number of bits in the adapter field.

ae-width *width*—(Ethernet subscribers only) Number of bits in the aggregated Ethernet identifier field.

atm—Specify width for fields for ATM subscribers.

port-width *width*—Number of bits in the port field.

pw-width *width*—(Ethernet subscribers only) Number of bits in the pseudowire field. Appears in the Cisco NAS-Port-Info AVP (100).

slot-width *width*—Number of bits in the slot field.

stacked-vlan-width *width*—Number of bits in the SVLAN ID field.

vci-width *width*—(ATM subscribers only) Number of bits in the ATM virtual circuit identifier (VCI) field.

vlan-width *width*—Number of bits in the VLAN ID field.

`vpi-width` *width*—(ATM subscribers only) Number of bits in the ATM virtual path identifier (VPI) field.

**NOTE:** The total of the widths must not exceed 32 bits, or the configuration will fail.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 9.1.

`ae-width` option added in Junos OS Release 12.1.

`atm` option added in Junos OS Release 12.3R3 and supported in later 12.3Rx releases.

`atm` option supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)

`pw-width` option added in Junos OS Release 15.1.

### RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

## network

### IN THIS SECTION

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## Syntax

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

## Hierarchy Level

```
[edit access address-assignment pool pool-name family inet]
```

## Description

Configure subnet information for an IPv4 address-assignment pool.

## Options

*ip-prefix*—IP version 4 address or prefix value.

*prefix-length*—(Optional) Subnet mask.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

# option-82 (Address-Assignment Pools)

## IN THIS SECTION

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- [Hierarchy Level | 166](#)
- [Description | 166](#)
- [Options | 166](#)
- [Required Privilege Level | 166](#)
- [Release Information | 167](#)

## Syntax

```
option-82 {  
    circuit-id value range named-range;  
    remote-id value range named-range;  
}
```

## Hierarchy Level

```
[edit access address-assignment pool pool-name family inet dhcp-attributes option-match],
[edit access protocol-attributes attribute-set-name option-match]
```

## Description

Specify the list of option 82 suboption match criteria used to select the named address range used for the client. The server matches the option 82 value in the user PDU to the specified option 82 match criteria and uses the named address range associated with the string.

## Options

**circuit-id** Configure the address-assignment pool named-range to use for a particular option 82 Agent Circuit ID value.

- Values:
  - *value*—String for the Agent Circuit ID suboption (suboption 1) of the DHCP relay agent information option (option 82) in DHCP packets.
  - range *named-range*—Name of the address-assignment pool range to use.

**remote-id** Specify the address-assignment pool named range to use based on the particular option 82 Agent Remote ID value.

- Values:
  - range *named-range*—Name of the address-assignment pool range to use.
  - *value*—String for Agent Remote ID suboption (suboption 2) of the DHCP relay agent information option (option 82) in DHCP packets.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

# option-match

## IN THIS SECTION

- [Syntax | 167](#)
- [Hierarchy Level | 168](#)
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## Syntax

```
option-match {  
  option-82 {  
    circuit-id value range named-range;  
    remote-id value range named-range;  
  }  
}
```



## Hierarchy Level

```
[edit access address-assignment pool pool-name family inet dhcp-attributes],  
[edit access protocol-attributes attribute-set-name]
```

## Description

Specify a list of match criteria used to determine which named address range in the address-assignment pool to use. The extended DHCP local server matches this information to the match criteria specified in the client PDUs. For example, for option 82 match criteria, the server matches the option 82 value in the user PDU to the specified option 82 string and uses the named range associated with the string.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

# options (Access Profile)

## IN THIS SECTION

- [Syntax | 169](#)
- [Hierarchy Level | 171](#)
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- [Options | 171](#)
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- [Release Information | 178](#)

## Syntax

```
options {
    accounting-session-id-format (decimal | description);
    calling-station-id-delimiter delimiter-character;
    calling-station-id-format {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        nas-identifier;
    }
    chap-challenge-in-request-authenticator;
    client-accounting-algorithm (direct | round-robin);
    client-authentication-algorithm (direct | round-robin);
    coa-dynamic-variable-validation;
    ethernet-port-type-virtual;
    interface-description-format {
        exclude-adapter;
        exclude-channel;
        exclude-sub-interface;
    }
    ip-address-change-notify message;
    juniper-access-line-attributes;
    nas-identifier identifier-value;
```

```

nas-port-extended-format {
    adapter-width width;
    ae-width width;
    port-width width;
    slot-width width;
    stacked-vlan-width width;
    vlan-width width;
    atm {
        adapter-width width;
        port-width width;
        pw-width width;
        slot-width width;
        vci-width width;
        vpi-width width;
    }
}
nas-port-id-delimiter delimiter-character;
nas-port-id-format {
    agent-circuit-id;
    agent-remote-id;
    concatenated-vlan-tags {
        fixed-size-inner-tag;
        fixed-size-outer-tag;
    }
    interface-description;
    interface-text-description;
    nas-identifier;
    order {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        interface-text-description;
        nas-identifier;
        postpend-vlan-tags;
    }
    postpend-vlan-tags;
}
nas-port-type {
    ethernet {
        port-type;
    }
}
override {

```

```

        calling-station-id remote-circuit-id;
        nas-ip-address tunnel-client-gateway-address;
        nas-port tunnel-client-nas-port;
        nas-port-type tunnel-client-nas-port-type;
    }
    remote-circuit-id-delimiter;
    remote-circuit-id-fallback;
    remote-circuit-id-format {
        agent-circuit-id;
        agent-remote-id;
    }
    revert-interval interval;
    service-activation {
        dynamic-profile (optional-at-login | required-at-login);
        extensible-service (optional-at-login | required-at-login);
    }
    vlan-nas-port-stacked-format;
}

```

## Hierarchy Level

```
[edit access profile profile-name radius]
```

## Description

Configure the options used by RADIUS authentication and accounting servers.

## Options

**accounting-session-id-format** (EX Series, MX Series only) Configure the format the router or switch uses to identify the accounting session. The default is decimal.

- Values:
  - decimal—Use the decimal format.
  - description—Use the generic format, in the form: *jnpr interface-specifier:subscriber-session-id*.

**calling-station-id-delimiter** (MX Series, T Series only) Starting in Junos OS Release 13.1, specify the character that the router uses as a separator between the concatenated values in the Calling-Station-ID (RADIUS IETF attribute 31) string. The router uses the delimiter when you configure more than one value in the `calling-station-id-format` statement. The default is the hash (#) character.

- Values:
  - *delimiter-character*—Character to use for the delimiter. You must enclose the delimiter character in quotation marks (" ").

**chap-challenge-in-request-authenticator** (MX Series only) Starting in Junos OS Release 15.1, configure the `authd` process to insert the random challenge generated by the NAS into the Request Authenticator field of Access-Request packets, if the challenge value is 16 bytes long. If you enable the `chap-challenge-in-request-authenticator` statement and the random challenge is not 16 bytes long, `authd` ignores the statement and uses the default behavior, which inserts the random challenge as the CHAP-Challenge attribute (RADIUS attribute 60) in Access-Request packets.

**client-accounting-algorithm** (EX Series, MX Series only) Starting in Junos OS Release 13.2X50-D10 for EX Series switches, configure the access method the router uses to access RADIUS accounting servers. The default is the `direct` option.

- Values:
  - `direct`—Use the direct method.
  - `round-robin`—Use the round-robin method.

**client-authentication-algorithm** (EX Series, M Series, MX Series only) Starting in Junos OS Release 13.2X50-D10 for EX Series switches, configure the method that the authenticator uses to access RADIUS authentication servers when there are multiple servers configured. Initially, a RADIUS client sends a request to a RADIUS authentication or accounting server. The router or switch, acting as the authenticator, waits for a response from the server before sending another request.

When there are multiple RADIUS server connections configured for a client, the authenticator attempts to reach the different servers in the order that they are

configured. If there is no response from the first RADIUS server, the authenticator attempts to reach the next RADIUS server. This process repeats until the client is either granted access or there are no more configured servers.

If the `direct` method is configured, the authenticator always treats the first server in the list as the primary server. The authenticator moves on to the second server only if the attempt to reach the first server fails. If the `round-robin` method is configured, the server chosen first will be rotated based on which server was used last. The first server in the list is treated as a primary for the first authentication request, but for the second request, the second server configured is treated as primary, and so on. With this method, all of the configured servers receive roughly the same number of requests on average so that no single server has to handle all of the requests.

**NOTE:** The `round-robin` access method is not supported on EX Series switches.

- **Default:** The default is the `direct` option.
- **Values:**
  - `direct`—Use the direct access method. The authenticator contacts the first RADIUS server on the list for each request, the second server if the first one fails, and so on.
  - `round-robin`—Use the round-robin method. The authenticator contacts the first RADIUS server for the first request, the second server for the second request, and so on.

#### **coa-dynamic-variable-validation**

(EX Series, M Series, MX Series only) Starting in Junos OS Release 13.2X50-D10 for EX Series switches, specify that when a CoA operation includes a change to a client profile dynamic variable that cannot be applied (such as an update to a non-existent filter), the router does not apply any changes to client profile dynamic variables in the request, and responds with a NACK message.

- **Default:** If you do not configure this statement, the router does not apply any incorrect variable updates, but does make any other changes to the client profile dynamic variables, and responds with an ACK message.

#### **ethernet-port-type-virtual**

(EX Series, M Series, MX Series only) Specify the physical port type the router or switch uses to authenticate clients. The router or switch passes a port type of `ethernet` in RADIUS attribute 61 (NAS-Port-Type) by default. This statement specifies a port type of `virtual`.

**NOTE:** This statement takes precedence over the `nas-port-type` statement if you include both statements in the same access profile.

#### **access-loop-id-local**

Specify that the Agent-Remote-Id and Agent-Circuit-Id are generated locally when these values are not present in the client database.

#### **ip-address-change-notify**

(MX Series only) Starting in Junos OS Release 13.1, for on-demand address allocation for dual-stack PPP subscribers, specify that the BNG includes the IPv4-Release-Control VSA (26-164) in the Access-Request that is sent during on-demand IP address allocation and in the Interim-Accounting messages that are sent to report an address change. The configuration of this statement has no effect when on-demand IP address allocation or deallocation is not configured.

Optionally, configure a message that is included in the VSA when it is sent to the RADIUS server.

- **Default:** This functionality is disabled by default.
- **Values:** *message*—VSA message.
- **Range:** Up to 32 characters.

#### **juniper-access-line-attributes**

Configure AAA to add Juniper Networks access line VSAs to the RADIUS authentication and accounting request messages for subscribers. If the router has not received and processed the corresponding ANCP attributes from the access node, then AAA provides only the following in these RADIUS messages:

- Downstream-Calculated-QoS-Rate (IANA 4874, 26-141)—Default configured advisory transmit speed.
- Upstream-Calculated-QoS-Rate (IANA 4874, 26-142)—Default configured advisory receive speed.

**NOTE:** Starting in Junos OS Release 19.2R1, the `juniper-access-line-attributes` option replaces the `juniper-dsl-attributes` option. The difference between these options is that `juniper-dsl-attributes` supported only DSL TLVs received in the ANCP Port Status message. The `juniper-access-line-attributes` option supports PON TLVs in addition to DSL TLVs, and will be extensible to future access technologies.

For backward compatibility with existing scripts, the `juniper-dsl-attributes` option redirects to the new `juniper-access-line-attributes` option. We recommend that you use `juniper-access-line-attributes`.

**NOTE:** The `juniper-access-line-attributes` option is not backward compatible with Junos OS Release 19.1 or earlier releases. This means that if you have configured `juniper-access-line-attributes` option in Junos OS Release 19.2 or higher releases, you must perform the following steps to downgrade to Junos OS Release 19.1 or earlier releases:

1. Delete the `juniper-access-line-attributes` option from all access profiles that include it.
2. Perform the software downgrade.
3. Add the `juniper-dsl-attributes` option to the affected access profiles.

- **Default:** The Juniper Networks access line VSAs are not added to the RADIUS authentication and accounting request messages. However, the DSL Forum VSA—if available—is added to RADIUS messages by default.

#### **nas-identifier**

(EX Series, MX Series, SRX Series only) Configure the value for the client RADIUS attribute 32 (NAS-Identifier). This attribute is used for authentication and accounting requests. This statement was introduced in Junos OS Release 15.1X49-D110 for SRX300, SRX320, SRX340, SRX345, and SRX550M Series devices.

- **Values:** *identifier-value*—String to use for authentication and accounting requests.
- **Range:** 1 through 64 characters.

#### **nas-port-id-delimiter**

(MX Series only) Starting in Junos OS Release 11.4, specify the character that the router uses as a separator between the concatenated values in the NAS-Port-ID string. The router uses the delimiter when you configure more than one value in the `nas-port-id-format` statement. The default is the hash (#) character. This statement was introduced in Junos OS Release 13.2X50-D10 for EX Series switches.

- **Values:** *delimiter-character*—Character used for the delimiter.

#### **remote-circuit-id-delimiter**

(MX Series only) Starting in Junos OS Release 13.3R1 on MX Series, configure a delimiter character for the remote circuit ID string when you use the `remote-circuit-`



id-format statement to configure the string to use instead of the Calling-Station ID in L2TP Calling Number AVP 22. If more than one value is configured for the remote circuit ID format, the delimiter character is used as a separator between the concatenated values in the resulting remote circuit ID string. The default is the hash (#) character.

- **Values:** *delimiter*—Delimiter character to be used between components of the remote circuit ID string.

#### **remote-circuit-id-fallback**

(MX Series only) Starting in Junos OS Release 13.3R1 on MX Series, configure the fallback value for the LAC to send in L2TP Calling Number AVP 22, either the configured Calling-Station-ID or the default underlying interface. Use of the fallback value is triggered when the components of the override string you configured with the remote-circuit-id-format statement—the ACI, the ARI, or both ACI and ARI—are not received by the LAC in the PPPoE Active Discovery Request (PADR) packet.

- **Values:**
  - configured-calling-station-id—Send the configured Calling-Station-ID in the Calling Number AVP.
  - default—Send the underlying interface value in the Calling Number AVP.

#### **remote-circuit-id-format**

(MX Series only) Starting in Junos OS Release 13.3R1 on MX Series, configure the format of the string that overrides the Calling-Station-ID format in the Calling Number AVP 22 sent by the LAC to the LNS in the ICRQ packet when an L2TP session is being established. You can specify the ACI, the ARI, or both the ACI and ARI. This statement enables you to decouple the AVP 22 value from the RADIUS Calling-Station-ID attribute (31); the values for AVP 22 and the Calling-Station-ID attribute are the same when you use the calling-station-id-format statement to configure AVP 22.

**NOTE:** You must configure the override calling-circuit-id remote-circuit-id statement for the remote circuit ID format to be used in the calling number AVP.

- **Values:**
  - agent-circuit-id—Specifies use of the ACI string that uniquely identifies the subscriber's access node and the digital subscriber line (DSL) on the access

node. For PPPoE traffic, the ACI string is in the DSL Forum Agent-Circuit-ID VSA [26-1] of PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) control packets.

- **agent-remote-id**—Specifies use of the ARI string that identifies the subscriber on the digital subscriber line access multiplexer (DSLAM) interface that initiated the service request. The agent remote identifier (ARI) string is stored in the DSL Forum Agent-Remote-ID VSA [26-2] for PPPoE traffic.

**service-activation** (MX Series only) Starting in Junos OS Release 16.2, specify whether subscribers are allowed to log in even when service activation failures related to configuration errors occur during family activation request processing by authd for a newly authenticated subscriber. Configuration errors include missing or incorrect syntax, missing or incomplete references to dynamic profiles, and missing or incomplete variables.

**NOTE:** This configuration does not apply to services activated by means of RADIUS CoA requests, JSRC Push-Profile-Request (PPR) messages, or subscriber secure policies.

You can enable separate configurations for subscriber login services for two service-activation types: **dynamic-profile** and **extensible-service**. You configure the **dynamic-profile** type services in the dynamic profile at the `[edit dynamic-profiles]` hierarchy level; the profile is used to provide dynamic subscriber access and services for broadband applications. The **extensible-service** type is for business services configured in an operation script and provisioned by the Extensible Subscriber Services Manager daemon (essmd).

- **Default:**

Default behavior depends on the service type:

- For **extensible-service** services: **optional-at-login**.
- For **dynamic-profile** services: **required-at-login**.

- **Values:**

- **optional-at-login**—Service activation is optional. Failure due to configuration errors does not prevent activation of the address family; it allows subscriber

access. Failure for any other reason causes network family activation to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber.

- **required-at-login**—Service activation is required. Failure for any reason causes the Network-Family-Activate-Request for that network family to fail. If no other network family is already active for the subscriber, then the client application logs out the subscriber.

**vlan-nas-port-stacked-format** (MX Series only) Configure RADIUS attribute 5 (NAS-Port) to include the S-VLAN ID, in addition to the VLAN ID, for subscribers on Ethernet interfaces.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 9.1.

**juniper-dsl-attributes** introduced in Junos OS Release 11.4.

**nas-port-id-delimiter** introduced in Junos OS Release 11.4. Statement introduced in Junos OS Release 13.2X50-D10 for EX Series switches.

**calling-station-id-delimiter** introduced in Junos OS Release 13.1.

**ip-address-change-notify** introduced in Junos OS Release 13.1.

**coa-dynamic-variable-validation**, **client-authentication-algorithm**, and **client-accounting-algorithm** introduced in Junos OS Release 13.2X50-D10 for EX Series switches.

**remote-circuit-id-delimiter**, **remote-circuit-id-fallback**, and **remote-circuit-id-format** introduced in Junos OS Release 13.3R1 on MX Series.

**chap-challenge-in-request-authenticator** introduced in Junos OS Release 15.1.

`nas-identifier` introduced in Junos OS Release 15.1X49-D110 for SRX300, SRX320, SRX340, SRX345, and SRX550M Series devices.

`service-activation` introduced in Junos OS Release 16.2.

`juniper-access-line-attributes` introduced in Junos OS Release 19.2R1.

## RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*RADIUS Authentication and Accounting Basic Configuration*

# order

## IN THIS SECTION

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

## Syntax

```
order [ accounting-method ];
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Set the order in which the Junos OS tries different accounting methods for client activity. When a client logs in, the software tries the accounting methods in the specified order.

## Options

*accounting-method*—One or more accounting methods. When a client logs in, the software tries the accounting methods in the following order, from first to last. The only valid value is radius for RADIUS accounting.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

| *RADIUS Authentication and Accounting Basic Configuration*

# pool (Address-Assignment Pools)

## IN THIS SECTION

- [Syntax | 181](#)
- [Hierarchy Level | 182](#)
- [Description | 182](#)
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## Syntax

```
pool pool-name {
    active-drain;
    family family {
        dhcp-attributes {
            [ protocol-specific attributes ]
        }
        excluded-address ip-address;
        excluded-range name low minimum-value high maximum-value;
        host hostname {
            hardware-address mac-address;
            ip-address ip-address;
        }
        network ip-prefixprefix-length>;
        prefix ipv6-prefix;
        range range-name {
            high upper-limit;
            low lower-limit;
            prefix-length prefix-length;
        }
    }
    hold-down;
```

```
link pool-name;  
}
```

## Hierarchy Level

```
[edit access address-assignment]  
[edit routing-instances routing-instances-name access address-assignment]
```

## Description

Configure the name of an address-assignment pool.

**NOTE:** Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.

## Options

***pool-name*** Name assigned to the address-assignment pool.

**active-drain** Configure the DHCP local server to stop allocating addresses from this pool. When this is configured, the DHCP local server gracefully shifts clients from this address pool to an alternative pool for which active drain is not configured. When existing clients with an address from this pool submit a DHCPv4 request or DHCPv6 renew, they receive a NAK, forcing them to renegotiate. The server responds with a DHCPv4 offer or DHCPv6 advertise message with an address from a different pool.

**family** Configure the protocol family for the address-assignment pool.

The options for this statement are explained separately. Click the linked statement for details.

- hold-down** Configure an address-assignment pool that is currently in use to be unavailable for further address allocation. When a pool is in the hold-down state, the pool is no longer used to allocate IP addresses for subscribers. Current subscribers who previously obtained an address from the pool are not affected; they can continue to renew their leases. As each of these users disconnects, their address is not reallocated. The pool becomes inactive when all subscribers have disconnected and their addresses are returned to the pool.
- link** Designate a secondary address-assignment pool that is linked to the pool being configured. When the pool being configured has no addresses available for allocation, the secondary pool can be searched for a free address. You can configure a chain of linked pools, but you cannot directly link more than one pool to or from any other pool. Each linked pool in the chain serves as a backup pool for the pool immediately before it in the chain.
- **Values:** *pool-name*—Name assigned to the secondary address-assignment pool.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

Support at the [edit routing-instances *routing-instances-name* access address-assignment] hierarchy level at tenant system level introduced in Junos OS Release 20.2R1.

## RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

*DHCP Client Attribute and Address Assignment*



# ppp (Group Profile)

## IN THIS SECTION

- [Syntax | 184](#)
- [Hierarchy Level | 185](#)
- [Description | 185](#)
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- [Required Privilege Level | 187](#)
- [Release Information | 187](#)

## Syntax

```
ppp {  
    cell-overhead;  
    encapsulation-overhead bytes;  
    framed-pool framed-pool;  
    idle-timeout seconds;  
    interface-id interface-id;  
    keepalive seconds;  
    ppp-options {  
        aaa-options aaa-options-name;  
        chap;  
        ignore-magic-number-mismatch;  
        initiate-ncp (ip | ipv6 | dual-stack-passive)  
        ipcp-suggest-dns-option;  
        mru;  
        mtu;  
        pap;  
        peer-ip-address-optional;  
    }  
    primary-dns primary-dns;  
    primary-wins primary-wins;  
    secondary-dns secondary-dns;
```

```
secondary-wins secondary-wins;
}
```

## Hierarchy Level

```
[edit access group-profile profile-name]
```

## Description

Configure PPP properties for a group profile.

## Options

<b>cell-overhead</b>	Configure the session to use Asynchronous Transfer Mode (ATM)-aware egress shaping on the IQ2 PIC.
<b>encapsulation-overhead</b>	<p>Configure the encapsulation overhead for class-of-service calculations.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>bytes</i>—The number of bytes used as encapsulation overhead for the session.</li> </ul>
<b>framed-pool</b>	<p>Configure the address pool.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>framed-pool</i>—References a configured address pool.</li> </ul>
<b>idle-timeout</b>	<p>Configure the idle timeout for a user. The router might consider a PPP session to be idle because of the following reasons:</p> <ul style="list-style-type: none"> <li>• There is no ingress traffic on the PPP session.</li> <li>• There is no egress traffic.</li> <li>• There is neither ingress or egress traffic on the PPP session.</li> <li>• There is no ingress or egress PPP control traffic. This is applicable only if keepalives are enabled.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Values:</b> <i>seconds</i>—Number of seconds a user can remain idle before the session is terminated.</li> <li>• <b>Range:</b> 0 through 4,294,967,295 seconds</li> <li>• <b>Default:</b> 0</li> </ul>
<b>interface-id</b> <i>interface-id</i>	<p>Configure the interface identifier.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>interface-id</i>—Identifier for the interface representing a Layer 2 Tunneling Protocol (L2TP) session configured at the [edit interfaces <i>interface-name</i> unit <i>local-unit-number</i> dial-options] hierarchy level. For more information about the interface ID, see <a href="#">Services Interface Naming Overview</a>.</li> </ul>
<b>keepalive</b>	<p>Configure the keepalive interval for an L2TP tunnel.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>seconds</i>—Time period that must elapse before the Junos OS checks the status of the Point-to-Point Protocol (PPP) session by sending an echo request to the peer.</li> </ul> <p>For L2TP on MX Series routers, the minimum recommended interval is 30 seconds. A value of 0 disables generation of keepalive messages from the LNS.</p> <ul style="list-style-type: none"> <li>• <b>Range:</b> 0 through 32,767 seconds</li> <li>• <b>Default:</b> 30 seconds</li> </ul>
<b>primary-dns</b>	<p>Configure the primary Domain Name System (DNS) server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>primary-dns</i>—An IPv4 address.</li> </ul>
<b>primary-wins</b>	<p>Configure the primary Windows Internet name server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>primary-wins</i>—An IPv4 address.</li> </ul>
<b>secondary-dns</b>	<p>Configure the secondary DNS server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>secondary-dns</i>—An IPv4 address.</li> </ul>
<b>secondary-wins</b>	<p>Configure the secondary Windows Internet name server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>secondary-wins</i>—An IPv4 address.</li> </ul>

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

*L2TP LNS Inline Service Interfaces*

# ppp (Profile)

### IN THIS SECTION

- [Syntax | 187](#)
- [Hierarchy Level | 188](#)
- [Description | 188](#)
- [Options | 188](#)
- [Required Privilege Level | 188](#)
- [Release Information | 189](#)

## Syntax

```
ppp {  
  cell-overhead;
```

```

encapsulation-overhead bytes;
framed-ip-address address;
framed-pool framed-pool;
idle-timeout seconds;
interface-id interface-id;
keepalive seconds;
primary-dns primary-dns;
primary-wins primary-wins;
secondary-dns secondary-dns;
secondary-wins secondary-wins;
}

```

## Hierarchy Level

```
[edit access profile profile-name client client-name]
```

## Description

Configure PPP properties for a client profile.

## Options

**framed-ip-address** (SRX Series, T Series only) Specify a framed IP address.

- **Values:** *address*—The IP version 4 (IPv4) prefix.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

Statement `idle-timeout` introduced in Junos OS Release 11.1 for the QFX Series.

Statement `idle-timeout` introduced in Junos OS Release 14.1X53-D20 for OCX Series switches.

### RELATED DOCUMENTATION

| [Point-to-Point Protocol \(PPP\)](#) | 4

# primary-dns

## IN THIS SECTION

- [Syntax](#) | 189
- [Hierarchy Level](#) | 190
- [Description](#) | 190
- [Options](#) | 190
- [Required Privilege Level](#) | 190
- [Release Information](#) | 190

## Syntax

```
primary-dns primary-dns;
```

## Hierarchy Level

```
[edit access group-profile profile-name client client-name ppp],  
[edit access profile profile-name ppp]
```

## Description

Configure the primary Domain Name System (DNS) server.

## Options

*primary-dns*—An IPv4 address.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

# primary-wins

## IN THIS SECTION

- [Syntax | 191](#)
- [Hierarchy Level | 191](#)
- [Description | 191](#)
- [Options | 192](#)
- [Required Privilege Level | 192](#)
- [Release Information | 192](#)

## Syntax

```
primary-wins primary-wins;
```

## Hierarchy Level

```
[edit access group-profile profile-name client client-name ppp],  
[edit access profile profile-name ppp]
```

## Description

Configure the primary Windows Internet name server.



## Options

*primary-wins*—An IPv4 address.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

# profile (Access)

### IN THIS SECTION

- [Syntax](#) | 193
- [Hierarchy Level](#) | 198
- [Description](#) | 199
- [Options](#) | 199
- [Required Privilege Level](#) | 199
- [Release Information](#) | 199

## Syntax

```

profile profile-name {
    accounting {
        address-change-immediate-update
        accounting-stop-on-access-deny;
        accounting-stop-on-failure;
        ancp-speed-change-immediate-update;
        coa-immediate-update;
        coa-no-override service-class-attribute;
        duplication;
        duplication-filter;
        duplication-vrf {
            access-profile-name profile-name;
            vrf-name vrf-name;
        }
        immediate-update;
        order [ accounting-method ];
        send-acct-status-on-config-change;
        statistics (time | volume-time);
        update-interval minutes;
        wait-for-acct-on-ack;
    }
    accounting-order (radius | [accounting-order-data-list]);
    authentication-order [ authentication-methods ];
    client client-name {
        chap-secret chap-secret;
        group-profile profile-name;
        ike {
            allowed-proxy-pair {
                remote remote-proxy-address local local-proxy-address;
            }
            pre-shared-key (ascii-text character-string | hexadecimal hexadecimal-digits);
            ike-policy policy-name;
            interface-id string-value;
        }
        l2tp {
            aaa-access-profile profile-name;
            interface-id interface-id;
            lcp-renegotiation;
            local-chap;
        }
    }
}

```

```

    maximum-sessions number;
    maximum-sessions-per-tunnel number;
    multilink {
        drop-timeout milliseconds;
        fragment-threshold bytes;
    }
    override-result-code session-out-of-resource;
    ppp-authentication (chap | pap);
    ppp-profile profile-name;
    service-profile profile-name(parameter)&profile-name;
    sessions-limit-group limit-group-name;
    shared-secret shared-secret;
}
pap-password pap-password;
ppp {
    cell-overhead;
    encapsulation-overhead bytes;
    framed-ip-address ip-address;
    framed-pool framed-pool;
    idle-timeout seconds;
    interface-id interface-id;
    keepalive seconds;
    primary-dns primary-dns;
    primary-wins primary-wins;
    secondary-dns secondary-dns;
    secondary-wins secondary-wins;
}
user-group-profile profile-name;
}
domain-name-server;
domain-name-server-inet;
domain-name-server-inet6;
local {
    flat-file-profile profile-name;
}
preauthentication-order preauthentication-method;
provisioning-order (gx-plus | jsr | pcrf);
radius {
    accounting-server [ ip-address ];
    attributes {
        exclude {
            attribute-name packet-type;
            standard-attribute number {

```

```

        packet-type [ access-request | accounting-off | accounting-on | accounting-
start | accounting-stop ];
    }
    vendor-id id-number {
        vendor-attribute vsa-number {
            packet-type [ access-request | accounting-off | accounting-on |
accounting-start | accounting-stop ];
        }
    }
}
ignore {
    dynamic-iflset-name;
    framed-ip-netmask;
    idle-timeout;
    input-filter;
    logical-system:routing-instance;
    output-filter;
    session-timeout;
    standard-attribute number;
    vendor-id id-number {
        vendor-attribute vsa-number;
    }
}
}
authentication-server [ ip-address ];
options {
    accounting-session-id-format (decimal | description);
    calling-station-id-delimiter delimiter-character;
    calling-station-id-format {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        interface-text-description;
        mac-address;
        nas-identifier;
        stacked-vlan;
        vlan;
    }
    chap-challenge-in-request-authenticator;
    client-accounting-algorithm (direct | round-robin);
    client-authentication-algorithm (direct | round-robin);
    coa-dynamic-variable-validation;
    ethernet-port-type-virtual;

```

```

interface-description-format {
    exclude-adapter;
    exclude-channel;
    exclude-sub-interface;
}
juniper-access-line-attributes;
nas-identifier identifier-value;
nas-port-extended-format {
    adapter-width width;
    ae-width width;
    port-width width;
    pw-width width;
    slot-width width;
    stacked-vlan-width width;
    vlan-width width;
    atm {
        adapter-width width;
        port-width width;
        slot-width width;
        vci-width width;
        vpi-width width;
    }
}
nas-port-id-delimiter delimiter-character;
nas-port-id-format {
    agent-circuit-id;
    agent-remote-id;
    interface-description;
    interface-text-description;
    nas-identifier;
    order {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        interface-text-description;
        nas-identifier;
        postpend-vlan-tags;
    }
    postpend-vlan-tags;
}
nas-port-type {
    ethernet {
        port-type;

```

```

    }
}
override {
    calling-station-id remote-circuit-id;
    nas-ip-address tunnel-client-gateway-address;
    nas-port tunnel-client-nas-port;
    nas-port-type tunnel-client-nas-port-type;
}
remote-circuit-id-delimiter;
remote-circuit-id-fallback {
    remote-circuit-id-format;
    agent-circuit-id;
    agent-remote-id;
}
revert-interval interval;
service-activation {
    dynamic-profile (optional-at-login | required-at-login);
    extensible-service (optional-at-login | required-at-login);
}
vlan-nas-port-stacked-format;
}
preauthentication-server ip-address;
}
radius-server server-address {
    accounting-port port-number;
    accounting-retry number;
    accounting-timeout seconds;
    dynamic-request-port
    port port-number;
    preauthentication-port port-number;
    preauthentication-secret password;
    retry attempts;
    routing-instance routing-instance-name;
    secret password;
    max-outstanding-requests value;
    source-address source-address;
    timeout seconds;
}
service {
    accounting {
        statistics (time | volume-time);
        update-interval minutes;
    }
}

```

```

    accounting-order (activation-protocol | local | radius);
}
session-limit-per-username number;
session-options {
    client-idle-timeout minutes;
    client-idle-timeout-ingress-only;
    client-session-timeout minutes;
    pcc-context {
        input-service-filter-name filter-name;
        input-service-set-name service-set-name;
        ipv6-input-service-filter-name filter-name;
        ipv6-input-service-set-name service-set-name;
        ipv6-output-service-filter-name filter-name;
        ipv6-output-service-set-name service-set-name;
        output-service-filter-name filter-name;
        output-service-set-name service-set-name;
        profile-name pcef-profile-name;
    }
    strip-user-name {
        delimiter [ delimiter ];
        parse-direction (left-to-right | right-to-left);
    }
}
subscriber username {
    delegated-pool delegated-pool-name;
    framed-ip-address ipv4-address;
    framed-ipv6-pool ipv6-pool-name;
    framed-pool ipv4-pool-name;
    password password;
    target-logical-system logical-system-name <target-routing-instance (default | routing-
instance-name>;
    target-routing-instance (default | routing-instance-name);
}
}

```

## Hierarchy Level

[edit access]

## Description

Configure a subscriber access profile that includes subscriber access, L2TP, or PPP properties.

## Options

*profile-name*—Name of the profile.

For CHAP, the name serves as the mapping between peer identifiers and CHAP secret keys. This entity is queried for the secret key whenever a CHAP challenge or response is received.

The remaining statements are explained separately. Search for a statement in [CLI Explorer](#) or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

*L2TP LNS Inline Service Interfaces*

[PPP Challenge Handshake Authentication Protocol | 44](#)

[PPP Password Authentication Protocol | 53](#)

*JSRC for Subscriber Provisioning and Accounting*

*Configuring Service Accounting in Local Flat Files*

*AAA Service Framework Overview*



## radius (Access Profile)

### IN THIS SECTION

- [Syntax | 200](#)
- [Hierarchy Level | 203](#)
- [Description | 203](#)
- [Options | 203](#)
- [Required Privilege Level | 204](#)
- [Release Information | 204](#)

### Syntax

```
radius {  
    accounting-server [ ip-address ];  
    attributes {  
        exclude  
            attribute-name packet-type;  
        standard-attribute number {  
            packet-type [ access-request | accounting-off | accounting-on | accounting-start  
| accounting-stop ];  
        }  
        vendor-id id-number {  
            vendor-attribute vsa-number {  
                packet-type [ access-request | accounting-off | accounting-on | accounting-  
start | accounting-stop ];  
            }  
        }  
    }  
    ignore {  
        dynamic-iflset-name;
```

```

        framed-ip-netmask;
        idle-timeout;
        input-filter;
        logical-system-routing-instance;
        output-filter;
        session-timeout;
        standard-attribute number;
        vendor-id id-number {
            vendor-attribute vsa-number;
        }
    }
}

authentication-server [ ip-address ];
options {
    accounting-session-id-format (decimal | description);
    calling-station-id-delimiter delimiter-character;
    calling-station-id-format {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        nas-identifier;
    }
    chap-challenge-in-request-authenticator;
    client-accounting-algorithm (direct | round-robin);
    client-authentication-algorithm (direct | round-robin);
    coa-dynamic-variable-validation;
    ethernet-port-type-virtual;
    interface-description-format {
        exclude-adapter;
        exclude-channel;
        exclude-sub-interface;
    }
    ip-address-change-notify message;
    juniper-access-line-attributes;
    nas-identifier identifier-value;
    nas-port-extended-format {
        adapter-width width;
        ae-width width;
        port-width width;
        slot-width width;
        stacked-vlan-width width;
        vlan-width width;
        atm {

```

```

        adapter-width width;
        port-width width;
        slot-width width;
        vci-width width;
        vpi-width width;
    }
}
nas-port-id-delimiter delimiter-character;
nas-port-id-format {
    agent-circuit-id;
    agent-remote-id;
    interface-description;
    interface-text-description;
    nas-identifier;
    order {
        agent-circuit-id;
        agent-remote-id;
        interface-description;
        interface-text-description;
        nas-identifier;
        postpend-vlan-tags;
    }
    postpend-vlan-tags;
}
nas-port-type {
    ethernet {
        port-type;
    }
}
override {
    calling-station-id remote-circuit-id;
    nas-ip-address tunnel-client-gateway-address;
    nas-port tunnel-client-nas-port;
    nas-port-type tunnel-client-nas-port-type;
}
remote-circuit-id-delimiter;
remote-circuit-id-fallback;
remote-circuit-id-format {
    agent-circuit-id;
    agent-remote-id;
}
revert-interval interval;
service-activation {

```

```

        dynamic-profile (optional-at-login | required-at-login);
        extensible-service (optional-at-login | required-at-login);
    }
    vlan-nas-port-stacked-format;
}
preauthentication-server ip-address;
}

```

## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

Configure the RADIUS parameters that the router uses for AAA authentication and accounting for subscribers.

## Options

<b>accounting-server</b>	<p>(MX Series only) Specify a list of the RADIUS accounting servers used for accounting for DHCP, L2TP, and PPP clients.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ip-address</i>—IP version 4 (IPv4) address.</li> </ul>
<b>authentication-server</b>	<p>(SRX Series only) Specify a list of the RADIUS authentication servers used to authenticate DHCP, L2TP, and PPP clients. The servers in the list are also used as RADIUS dynamic-request servers, from which the router accepts and processes RADIUS disconnect requests, CoA requests, and dynamic service activations and deactivations.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>ip-address</i>—IPv4 address.</li> </ul>
<b>preauthentication-server</b>	<p>(MX Series only) Starting in Junos OS Release 13.3, specify the RADIUS preauthentication server, which is used for the LLID service.</p>

**NOTE:** You cannot configure this statement if the Calling-Station-ID attribute is excluded from RADIUS Access-Request messages by the `exclude` statement.

- **Values:** *ip-address*—IPv4 address.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Authentication and Accounting Basic Configuration*

*RADIUS Logical Line Identification*

# radius-disconnect

## IN THIS SECTION

- [Syntax](#) | 205
- [Hierarchy Level](#) | 205

- [Description | 205](#)
- [Options | 205](#)
- [Required Privilege Level | 206](#)
- [Release Information | 206](#)

## Syntax

```
radius-disconnect {  
    client-address {  
        secret (RADIUS) password;  
    }  
}
```

## Hierarchy Level

```
[edit access]
```

## Description

Configure a disconnect server that listens on a configured User Datagram Protocol (UDP) port for disconnect messages from a configured client and processes these disconnect messages.

## Options

***client-address***      A valid IP address configured on one of the router interfaces.

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

*RADIUS Authentication and Accounting Basic Configuration*

[Example: Configure CHAP Authentication with RADIUS | 49](#)

[RADIUS Authentication for L2TP | 57](#)

# radius-disconnect-port

### IN THIS SECTION

- [Syntax | 207](#)
- [Hierarchy Level | 207](#)
- [Description | 207](#)
- [Options | 207](#)
- [Required Privilege Level | 207](#)
- [Release Information | 208](#)

## Syntax

```
radius-disconnect-port port-number;
```

## Hierarchy Level

```
[edit access]
```

## Description

Specify a port number on which to contact the RADIUS disconnect server. Most RADIUS servers use port number 1700.

## Options

*port-number*—The server port to which disconnect requests from the RADIUS client are sent. The L2TP network server, which accepts these disconnect requests, is the server.

**NOTE:** The Junos OS accepts disconnect requests only from the client address configured at the [edit access radius-disconnect client *client-address*] hierarchy level.

The remaining statements are explained separately.

## Required Privilege Level

admin—To view this statement in the configuration.

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



## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[RADIUS Authentication for L2TP](#) | 57

# radius-server

## IN THIS SECTION

- [Syntax](#) | 208
- [Hierarchy Level](#) | 209
- [Description](#) | 209
- [Options](#) | 209
- [Required Privilege Level](#) | 213
- [Release Information](#) | 213

## Syntax

```
radius-server server-address {  
    accounting-port port-number;  
    accounting-retry number;  
    accounting-timeout seconds;  
    dynamic-request-port port-number;  
    max-outstanding-requests value;  
    port port-number;  
    preauthentication-port port-number;  
    preauthentication-secret password;  
    retry attempts;  
    routing-instance routing-instance-name;
```

```
secret password;  
source-address source-address;  
timeout seconds;  
}
```

## Hierarchy Level

```
[edit access],  
[edit access profile profile-name]
```

## Description

Configure RADIUS for subscriber access management, L2TP, or PPP.

To configure multiple RADIUS servers, include multiple `radius-server` statements. The servers are tried in order and in a round-robin fashion until a valid response is received from one of the servers or until all the configured retry limits are reached.

## Options

***server-address*** IPv4 or IPv6 address of the RADIUS server.

***accounting-port*** Configure the port number on which to contact the RADIUS accounting server.

**NOTE:** Specifying the accounting port is optional, and port 1813 is the default. However, we recommend that you configure it in order to avoid confusion, as some RADIUS servers might refer to an older default.

- **Values:** *port-number*—Port number on which to contact the RADIUS accounting server. Most RADIUS servers use port 1813, as specified in RFC 2866.
- **Default:** 1813

**accounting-retry**

Configure the number of times the device retransmits RADIUS accounting messages when no response is received from the server. When you do not configure this statement, the number of retry attempts is determined by the `retry` statement.

**NOTE:** To successfully set a retry limit for the accounting servers different from the authentication servers, you must configure both the `accounting-retry` and `accounting-timeout` statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the `retry` and `timeout` statements.

**NOTE:** The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

- **Values:** *number*—Number of retry attempts.
- **Range:** 0 through 100
- **Default:** 0 (disabled)

**accounting-timeout**

Configure how long the local device waits to receive a response from a RADIUS accounting server before retransmitting the message. When you do not configure this statement, the length of the timeout is determined by the `timeout` statement.

**NOTE:** To successfully set a timeout value for the accounting servers different from the authentication servers, you must configure both the `accounting-retry` and `accounting-timeout` statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the `retry` and `timeout` statements.

**NOTE:** The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

- **Values:** *seconds*—Duration of timeout period.
- **Range:** 0 through 1000 seconds
- **Default:** 0 (disabled)

### dynamic-request-port

Specify the port that the router monitors for dynamic (CoA) requests from the specified RADIUS servers. You can configure a port globally or for a specific access profile.

You must either use the default port for all RADIUS servers or configure the same nondefault port for all RADIUS servers. This rule applies at both the global access and access profile levels.

**NOTE:** Any other configuration results in a commit check failure. Multiple port numbers—that is, different port numbers for different servers—are not supported.

- **Values:** *port-number*—Number of the monitored port.
- **Default:** 3799 (as specified in RFC 5176)

### max-outstanding-requests

Configure the maximum number of outstanding requests for this RADIUS server. An increase in this value is immediate while a decrease is more gradual if the current number of outstanding requests exceeds the new value.

- **Values:** *requests*—Maximum number of outstanding requests for this RADIUS server.
- **Range:** 0 through 2000 outstanding requests per server
- **Default:** 1000 outstanding requests per server

### port

Configure the port number on which to contact the RADIUS server.

- **Values:** *port-number*—Port number on which to contact the RADIUS server.
- **Default:** 1812 (as specified in RFC 2865)

### preauthentication-port

Configure the port number on which to contact the RADIUS server for logical line identification (LLID) preauthentication requests. If you do not configure a separate UDP port for preauthentication purposes, the same UDP port that you configure for authentication messages by including the *port port-number* statement is used.

	<ul style="list-style-type: none"> <li>• <b>Values:</b> <i>port-number</i>—Port number used for preauthentication requests to contact the RADIUS server.</li> </ul>
<b>preauthentication-secret</b>	<p>Configure the password to use with the RADIUS server for LLID preauthentication requests. If you do not configure a separate UDP password for preauthentication purposes, the same password that you configure for authentication messages by including the <i>secret password</i> statement is used. The secret password used by the local router must match that used by the server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>password</i>—Password to use. To include spaces enclose the character string in quotation marks.</li> </ul>
<b>retry</b>	<p>Specify the number of times that the device is allowed to attempt to contact a RADIUS authentication or accounting server. You can override the retry limit for accounting servers with the <i>accounting-retry</i> statement.</p> <div> <p><b>NOTE:</b> To successfully set a retry limit for the accounting servers different from the authentication servers, you must configure both the <i>accounting-retry</i> and <i>accounting-timeout</i> statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the <i>retry</i> and <i>timeout</i> statements.</p> <p><b>NOTE:</b> The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.</p> </div> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>attempts</i>—Number of times that the router is allowed to attempt to contact a RADIUS server.</li> <li>• <b>Range:</b> 1 through 100</li> <li>• <b>Default:</b> 3</li> </ul>
<b>routing-instance</b>	<p>Configure the routing instance used to send RADIUS packets to the RADIUS server.</p> <ul style="list-style-type: none"> <li>• <b>Values:</b> <i>routing-instance-name</i>—Routing instance name.</li> </ul>
<b>source-address</b>	<p>Configure a source address for each configured RADIUS server. Each RADIUS request sent to a RADIUS server uses the specified source address. Support for IPv6 <i>source-address</i> was introduced in Junos OS Release 16.1.</p>

- **Values:** *source-address*—Valid IPv4 or IPv6 address configured on one of the router or switch interfaces. On M Series routers only, the source address can be an IPv6 address and the UDP source port is 514.

## timeout

Configure the amount of time that the local device waits to receive a response from RADIUS authentication and accounting servers. You can override the timeout value for accounting servers with the `accounting-timeout` statement.

**NOTE:** To successfully set a timeout value for the accounting servers different from the authentication servers, you must configure both the `accounting-retry` and `accounting-timeout` statements. If you configure only one of these statements, then the value you configure is ignored in favor of the values configured with the `retry` and `timeout` statements.

**NOTE:** The maximum retry duration (the number of retries times the length of the timeout) cannot exceed 2700 seconds. An error message is displayed if you configure a longer duration.

- **Values:** *seconds*—Amount of time to wait.
- **Range:** 1 through 1000 seconds
- **Default:** 3 seconds

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

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

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

## Release Information

Statement introduced before Junos OS Release 7.4.

`max-outstanding-requests` introduced in Junos OS Release 11.4.

`accounting-retry` and `accounting-timeout` introduced in Junos OS Release 14.1.

`dynamic-request-port` option added in Junos OS Release 14.2R1 for MX Series routers.

`preauthentication-port` and `preauthentication-secret` options added in Junos OS Release 15.1 for MX Series routers.

`accounting-port` introduced in Junos OS Release 13.2X50-D10 for EX Series switches with support for Enhanced Layer 2 software (ELS). It was introduced in Junos OS without ELS in the following releases: Junos OS Releases 12.3R10, 14.1X53-D25, and 15.1R4 for EX Series switches.

Support for IPv6 `server-address` introduced in Junos OS Release 16.1.

## RELATED DOCUMENTATION

*RADIUS Authentication and Accounting Basic Configuration*

[PPP Password Authentication Protocol | 53](#)

[RADIUS Authentication for L2TP | 57](#)

*RADIUS Authentication*

[Configuring RADIUS-Initiated Dynamic Request Support](#)

*RADIUS Logical Line Identification*

*show network-access aaa statistics*

*clear network-access aaa statistics*

# range (Address-Assignment Pools)

## IN THIS SECTION

- [Syntax | 215](#)
- [Hierarchy Level | 215](#)
- [Description | 215](#)
- [Options | 215](#)
- [Required Privilege Level | 216](#)

## Syntax

```
range range-name {  
    high upper-limit;  
    low lower-limit;  
    prefix-length prefix-length;  
}
```

## Hierarchy Level

```
[edit access address-assignment pool pool-name family (inet | inet6)]
```

## Description

Configure a named range of IPv4 addresses or IPv6 prefixes, used within an address-assignment pool.

## Options

*high upper-limit*—Upper limit of an address range or IPv6 prefix range.

*low lower-limit*—Lower limit of an address range or IPv6 prefix range.

*prefix-length prefix-length*—Assigned length of the IPv6 prefix.

*range-name*—Name assigned to the range of IPv4 addresses or IPv6 prefixes.



## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.0.

IPv6 support introduced in Junos OS Release 10.0.

### RELATED DOCUMENTATION

*Address-Assignment Pools for Subscriber Management*

# revert-interval (Access)

#### IN THIS SECTION

- [Syntax | 216](#)
- [Hierarchy Level | 217](#)
- [Description | 217](#)
- [Options | 217](#)
- [Required Privilege Level | 217](#)
- [Release Information | 217](#)

## Syntax

```
revert-interval interval;
```

## Hierarchy Level

```
[edit access profile profile-name radius options],  
[edit access radius-options]
```

## Description

Configure the amount of time the router or switch waits after a server has become unreachable. The router or switch rechecks the connection to the server when the specified interval expires. If the server is then reachable, it is used in accordance with the order of the server list.

## Options

*interval*—Amount of time to wait.

- **Range:** 0 through 604,800 seconds
- **Default:** 60 seconds

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

### RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

## secondary-dns

### IN THIS SECTION

- [Syntax | 218](#)
- [Hierarchy Level | 218](#)
- [Description | 218](#)
- [Options | 219](#)
- [Required Privilege Level | 219](#)
- [Release Information | 219](#)

### Syntax

```
secondary-dns secondary-dns;
```

### Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

### Description

Configure the secondary DNS server.

## Options

*secondary-dns*—An IPv4 address.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\)](#) | 4

# secondary-wins

#### IN THIS SECTION

- [Syntax](#) | 220
- [Hierarchy Level](#) | 220
- [Description](#) | 220
- [Options](#) | 220
- [Required Privilege Level](#) | 220
- [Release Information](#) | 220

## Syntax

```
secondary-wins secondary-wins;
```

## Hierarchy Level

```
[edit access group-profile profile-name ppp],  
[edit access profile profile-name client client-name ppp]
```

## Description

Configure the secondary Windows Internet name server.

## Options

*secondary-wins*—An IPv4 address.

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

## RELATED DOCUMENTATION

[Point-to-Point Protocol \(PPP\) | 4](#)

[Layer 2 Tunneling Protocol \(L2TP\) | 21](#)

# secret (RADIUS)

## IN THIS SECTION

- [Syntax | 221](#)
- [Hierarchy Level | 221](#)
- [Description | 222](#)
- [Options | 222](#)
- [Required Privilege Level | 222](#)
- [Release Information | 222](#)

## Syntax

```
secret password;
```

## Hierarchy Level

```
[edit access profile profile-name radius-server server-address],  
[edit access radius-disconnect client-address],  
[edit access radius-server server-address]
```

## Description

Configure the password to use with the RADIUS server. The secret password used by the local router or switch must match that used by the server.

## Options

*password*—Password to use; it can include spaces if the character string is enclosed in quotation marks.

## Required Privilege Level

system—To view this statement in the configuration.

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

## Release Information

Statement introduced before Junos OS Release 7.4.

### RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

[Example: Configure CHAP Authentication with RADIUS | 49](#)

[RADIUS Authentication for L2TP | 57](#)

# session-options

## IN THIS SECTION

- [Syntax | 223](#)
- [Hierarchy Level | 224](#)
- [Description | 224](#)
- [Options | 224](#)
- [Required Privilege Level | 226](#)
- [Release Information | 226](#)

## Syntax

```
session-options {
  client-group [ group-names ];
  client-idle-timeout minutes;
  client-idle-timeout-ingress-only;
  client-session-timeout minutes;
  pcc-context {
    input-service-filter-name filter-name;
    input-service-set-name service-set-name;
    ipv6-input-service-filter-name filter-name;
    ipv6-input-service-set-name service-set-name;
    ipv6-output-service-filter-name filter-name;
    ipv6-output-service-set-name service-set-name;
    output-service-filter-name filter-name;
    output-service-set-name service-set-name;
    profile-name pcef-profile-name;
  }
  strip-user-name {
    delimiter [ delimiter ];
    parse-direction (left-to-right | right-to-left);
  }
}
```



## Hierarchy Level

```
[edit access profile profile-name]
```

## Description

(MX Series and SRX Series devices) Define options to place limits on subscriber access based on how long the session has been up, how long the user has been inactive, or both.

(MX Series) Define options to modify a subscriber username at login based on the subscriber's access profile.

(MX Series) Specify characteristics related to policy and charging control (PCC) rules, such as the PCEF profile that contains the rules, service sets to process the rules, and service filters for the service sets.

## Options

### client-idle-timeout

Specify the grace period that begins after an authenticated user terminates all sessions and connections. Authentication is not required if a new connection is initiated during the grace period by the same user.

During this period, the router determines whether the subscriber is inactive by monitoring data traffic, both upstream from the user (ingress) and downstream to the user (egress). Control traffic is ignored. The subscriber is not considered idle as long as data traffic is detected in either direction. When no traffic is detected for the duration of the idle time out, non-DHCP subscribers (such as L2TP or PPP) are gracefully logged out, similarly to a RADIUS-initiated disconnect or a CLI-initiated logout; DHCP subscribers are disconnected.

When you additionally configure the related `client-idle-timeout-ingress-only` statement (MX Series only), the router monitors only ingress traffic to determine whether the subscriber is inactive; it does not monitor any egress traffic. The related `client-session-timeout` statement terminates the subscriber session when the session timeout expires regardless of user activity.

Client idle timeouts are most often used for residential services rather than business services. The most practical use case for this timeout is in a PPP access model. It is not practical for DHCP or DHCPv6 subscribers.

Although you can use the `client-idle-timeout` statement for dynamically configured subscriber VLANs, this configuration is useful only in limited circumstances (such as IP over Ethernet without DHCP and with fixed addresses) and is not typically used. If you do use the idle timeout for VLANs, the timeout period starts when the VLAN is instantiated. It resets when a client session is created or an existing session is reactivated. When no traffic is detected on an authenticated VLAN for the duration of the timeout, the VLAN is considered inactive and is deleted. If no client sessions are ever created on the VLAN, then the VLAN is removed when the timeout expires.

- **Default:** The timeout is not configured.
- **Values:** *minutes*—Number of minutes of idle time that elapse before the session is terminated. The value that you specify must be determined locally with consideration of the services and policies that you offer.
- **Range:** 10 through 1440 minutes

#### **client-idle-timeout-ingress-only**

Specify that only ingress traffic is monitored for subscriber idle timeout processing for the duration of the idle timeout period that you specify with the `client-idle-timeout` statement. If no ingress traffic is received for the duration of the timeout, then the subscriber is gracefully logged out (non-DHCP subscribers) or disconnected (DHCP subscribers).

If you configure `client-idle-timeout` alone, then both ingress and egress traffic are monitored during the idle timeout. Monitoring only ingress traffic is useful in cases where the LNS sends traffic to the remote peer even when the peer is not up, such as when the LNS does not have PPP keepalives enabled and therefore does not detect that the peer is not up. Because the LAC monitors both ingress and egress traffic by default, in this situation it receives the egress traffic from the LNS and either does not log out the subscriber or delays detection of inactivity until the egress traffic ceases. When you specify that only ingress traffic is monitored in this case, the LAC can detect that the peer is inactive and then initiate logout.

#### **client-session-timeout**

Specify the amount of time after which user sessions are terminated, regardless of user activity (also known as a forced or hard authentication timeout).

Alternatively, when you want subscribers to be identified as inactive before they are terminated, use the related statements, `client-idle-timeout` and `client-idle-timeout-ingress-only`. Use `client-idle-timeout` alone to specify a period of time during which both ingress and egress subscriber data traffic is monitored; if no traffic is detected for the duration of the period, the subscriber is considered inactive and is terminated. Add the `client-idle-timeout-ingress-only` statement to monitor only ingress traffic for the duration of the timeout set with the `client-idle-timeout` statement.

**BEST PRACTICE:** We recommend that you do not configure a session timeout for subscribers receiving voice services. Because the session timeout is a simple time-based timeout, it is likely to interrupt subscribers actively using a voice service and terminate their calls unexpectedly (from the subscriber viewpoint). This result is a particular concern for emergency services calls.

Client session timeouts are most often used for residential services rather than business services. The most practical use case for this timeout is in a PPP access model when no voice services are offered. For DHCP or DHCPv6 subscribers, the session timeout is used as the DHCP lease timer if no other lease time configuration is present.

Although you can use the `client-session-timeout` statement for dynamically configured subscriber VLANs, this configuration is useful only in limited circumstances (such as IP over Ethernet without DHCP and with fixed addresses) and is not typically used. If you do use the session timeout for VLANs, the timeout period starts when the VLAN is instantiated.

- **Default:** The timeout is not configured.
- **Values:** *minutes*—Number of minutes after which user sessions are terminated. The value that you specify must be determined locally with consideration of the services and policies that you offer.
- **Range:** 1 through 527040 minutes

The remaining statements are explained separately. Search for a statement in CLI Explorer or click a linked statement in the Syntax section for details.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 8.5.

## RELATED DOCUMENTATION

*Session Options for Subscriber Access*

[Enabling Direct PCC Rule Activation by a PCRF for Subscriber Management](#)

# statistics (Access Profile)

## IN THIS SECTION

- [Syntax | 227](#)
- [Hierarchy Level | 227](#)
- [Description | 228](#)
- [Options | 228](#)
- [Required Privilege Level | 228](#)
- [Release Information | 228](#)

## Syntax

```
statistics (time | volume-time);
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Configure the router or switch to collect time statistics, or both volume and time statistics, for the sessions being managed by AAA.

## Options

`time`—Collect uptime statistics only.

`volume-time`—Collect both volume and uptime statistics.

## Required Privilege Level

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

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

## Release Information

Statement introduced in Junos OS Release 9.1.

`volume-time` option added in Junos OS Release 9.4.

## RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

# update-interval

## IN THIS SECTION

- [Syntax | 229](#)
- [Hierarchy Level | 229](#)
- [Description | 229](#)
- [Default | 230](#)
- [Options | 230](#)
- [Required Privilege Level | 230](#)
- [Release Information | 230](#)

## Syntax

```
update-interval minutes;
```

## Hierarchy Level

```
[edit access profile profile-name accounting]
```

## Description

Enable interim accounting updates and configure the amount of time that the router or switch waits before sending a new accounting update.

Interim accounting updates are included in the exchange of messages between the client and the accounting server. In RADIUS accounting, the client is the network access server (NAS), which can be the router or switch. The NAS sends Accounting-Request messages to the server, which acknowledges

receipt of the requests with Accounting-Response messages. Interim accounting updates are sent in Accounting-Request packets with the Acct-Status-Type attribute set to Interim-Update.

When a user is authenticated, the authentication server issues an Access-Accept message in response to a successful Access-Request message. The interval between interim updates can be configured directly on the server using the Acct-Interim-Interval attribute of the Access-Accept message. However, if the update interval is configured on the NAS using `update-interval`, then the system prefers the attributes returned by RADIUS and overrides the locally configured values.

**NOTE:** All information in an interim update message is cumulative from the beginning of the session, not from the last interim update message.

## Default

No interim updates are sent from the client to the accounting server.

## Options

*minutes*—Amount of time between updates, in minutes. All values are rounded to the next higher multiple of 10. For example, the values 811 through 819 are all accepted by the CLI, but are all rounded up to 820.

- **Range:** 10 through 1440 minutes

## Required Privilege Level

admin—To view this statement in the configuration.

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

## Release Information

Statement introduced in Junos OS Release 9.1.

## RELATED DOCUMENTATION

*RADIUS Servers and Parameters for Subscriber Access*

*ANCP Agent and AAA*



# 5

CHAPTER

## Administrative Commands

---

`clear network-access aaa statistics` | 233

`clear network-access aaa subscriber` | 238

`clear services l2tp session` | 241

`clear services l2tp tunnel statistics` | 245

`show services l2tp radius` | 247

---

# clear network-access aaa statistics

## IN THIS SECTION

- [Syntax | 233](#)
- [Description | 233](#)
- [Options | 234](#)
- [Required Privilege Level | 234](#)
- [Output Fields | 235](#)
- [Sample Output | 235](#)
- [Release Information | 237](#)

## Syntax

```
clear network-access aaa statistics
<accounting>
<address-assignment (client | pool pool-name)>
<authentication>
<dynamic-requests>
<radius>
<re-authentication>
<session-limit-per-username username username access-profile profile-name>
<terminate-code>
```

## Description

Clear AAA statistics.

## Options

<b>accounting</b>	(Optional) Clear AAA accounting statistics.
<b>address-assignment client</b>	(Optional) Clear AAA address-assignment statistics for the client.
<b>address-assignment pool <i>pool-name</i></b>	(Optional) Clear AAA address-assignment pool statistics.
<b>authentication</b>	(Optional) Clear AAA authentication statistics.
<b>dynamic-requests</b>	(Optional) Clear AAA dynamic-request statistics.
<b>radius</b>	(Optional) Clears the values in the Peak and Exceeded columns only.
<b>re-authentication</b>	(Optional) Clear AAA reauthentication statistics.
<b>session-limit-per-username</b>	<p>(MX Series routers only) (Optional) Clear all blocked request statistics for all access profiles from the username session-limit table. You can also specify additional options:</p> <ul style="list-style-type: none"> <li>• <b>username <i>username</i></b>—Clear the blocked request statistics for the specified username across all access profiles. A given username can be used in more than one access profile.</li> <li>• <b>access-profile <i>profile-name</i></b>—Clear the blocked request statistics for all usernames in the specified access profile.</li> </ul>
<div> <p><b>NOTE:</b> This command does not clear (delete) the entry in the session-limit table. Entries in the table are added or deleted during session login or logout processing.</p> </div>	
<b>terminate-code</b>	(Optional) Clear AAA termination code statistics.

## Required Privilege Level

maintenance

## Output Fields

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

## Sample Output

### clear network-access aaa statistics accounting

```
user@host> clear network-access aaa statistics accounting
```

### clear network-access aaa statistics address-assignment pool

```
user@host> clear network-access aaa statistics address-assignment pool isp_1
```

### clear network-access aaa statistics radius

```
user@host> clear network-access aaa statistics radius
```

### clear network-access aaa statistics session-limit-per-username (All Usernames Across All Access Profiles)

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	1	4
xyz@example.net	BNG1	3	5
abc@example.net	BNG2	2	5
pqr@example.net	BNG2	3	4

```
user@host> clear network-access aaa statistics session-limit-per-username
```

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	0	4
xyz@example.net	BNG1	0	5

abc@example.net	BNG2	0	5
pqr@example.net	BNG2	0	4

### clear network-access aaa statistics session-limit-per-username (Specific Username Across All Access Profiles)

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	1	4
xyz@example.net	BNG1	3	5
rkv@example.net	BNG2	2	5
pqr@example.net	BNG2	3	4

```
user@host> clear network-access aaa statistics session-limit-per-username username rkv@example.net
```

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
<b>rkv@example.net</b>	<b>BNG1</b>	<b>0</b>	4
xyz@example.net	BNG1	3	5
<b>rkv@example.net</b>	<b>BNG2</b>	<b>0</b>	5
pqr@example.net	BNG2	3	4

### clear network-access aaa statistics session-limit-per-username (All Usernames for Specific Access Profiles)

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	1	4
xyz@example.net	BNG1	3	5
rkv@example.net	BNG2	2	5
pqr@example.net	BNG2	3	4

```
user@host> clear network-access aaa statistics session-limit-per-username access-profile BNG2
```

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	1	4
xyz@example.net	BNG1	3	5

123@example.net	BNG2	0	5
pqr@example.net	BNG2	0	4

## clear network-access aaa statistics session-limit-per-username (Specific Username in Specific Access Profile)

```
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
rkv@example.net	BNG1	1	4
xyz@example.net	BNG1	3	5
rkv@example.net	BNG2	2	5
pqr@example.net	BNG2	3	4

```
user@host> clear network-access aaa statistics session-limit-per-username username
rkv@example.net access-profile BNG2
user@host> show network-access aaa statistics on-limit-per-username detail
```

Username	Access-profile	Blocked requests	Session count
<b>rkv@example.net</b>	<b>BNG1</b>	<b>3</b>	4
xyz@example.net	BNG1	3	5
<b>rkv@example.net</b>	<b>BNG2</b>	<b>0</b>	5
pqr@example.net	BNG2	3	4

## Release Information

Command introduced in Junos OS Release 10.0.

radius option introduced in Junos OS Release 11.4

terminate-code option introduced in Junos OS Release 11.4.

session-limit-per-username option introduced in Junos OS Release 18.4R1 on MX Series routers.

## RELATED DOCUMENTATION

[Verifying and Managing Subscriber AAA Information](#)

[Understanding Session Options for Subscriber Access](#)

[Limiting the Number of Active Sessions per Username and Access Profile](#)

[show network-access aaa statistics](#)

## clear network-access aaa subscriber

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- [Output Fields | 239](#)
- [Sample Output | 239](#)
- [Release Information | 240](#)

### Syntax

```
clear network-access aaa subscriber  
<session-id identifier <reconnect>>  
<statistics username username>  
<username username <reconnect>>
```

### Description

Clear AAA subscriber statistics and log out subscribers. You can log out subscribers based on the username or on the subscriber session identifier. Use the session identifier when more than one session has the same username string.

## Options

**reconnect** (Optional) Reconnect as a Layer 2 wholesale session when the subscriber session has been fully logged out. This option is equivalent to issuing a RADIUS-initiated disconnect with reconnect semantics; that is, when the message includes Acct-Terminate-Cause (RADIUS attribute 49) with a value of callback (16). You can apply this option to either a Layer 2 wholesale session or a conventionally auto-sensed dynamic VLAN supporting a PPPoE session.

In the latter case, this option triggers a PPPoE session logout and removal of the dynamic VLAN logical interface. This is followed by authorization of the access-line to attempt creation of a dynamic VLAN IFL supporting Layer 2 wholesale session in its place.

**session-id  
identifier** (Optional) Log out the subscriber based on the subscriber session identifier.

**statistics  
username  
username** (Optional) Clear AAA subscriber statistics and log out the subscriber.

**username  
username** (Optional) Log out the AAA subscriber.

## Required Privilege Level

maintenance

## Output Fields

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

## Sample Output

**clear network-access aaa subscriber statistics username**

```
user@host> clear network-access aaa subscriber statistics username user22@example.com
```



### **clear network-access aaa subscriber statistics username (Tenant systems)**

```
user@host:TSYS1> clear network-access aaa subscriber statistics username user22@example.com
```

### **clear network-access aaa subscriber username**

```
user@host> clear network-access aaa subscriber username user22@example.com
```

### **clear network-access aaa subscriber username (Tenant systems)**

```
user@host:TSYS1> clear network-access aaa subscriber username user22@example.com
```

### **clear network-access aaa subscriber session-id**

```
user@host> clear network-access aaa subscriber session-id 18367425
```

### **clear network-access aaa subscriber session-id (Tenant systems)**

```
user@host:TSYS1> clear network-access aaa subscriber session-id 1
```

## **Release Information**

Command introduced in Junos OS Release 9.1.

reconnect and session-id options added in Junos OS Release 16.1R4.

### **RELATED DOCUMENTATION**

| [Verifying and Managing Subscriber AAA Information](#)

# clear services l2tp session

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- [Output Fields | 243](#)
- [Sample Output | 243](#)
- [Sample Output | 244](#)
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## Syntax

```
clear services l2tp session (all | interface interface-name | local-gateway gateway-address |
local-gateway-name gateway-name | local-session-id session-id | local-tunnel-id tunnel-id |
peer-gateway gateway-address | peer-gateway-name gateway-name | routing-instance routing-
instance-name | tunnel-group group-name | user username)
```

## Description

(M10i and M7i routers only) Clear Layer 2 Tunneling Protocol (L2TP) sessions on LNS.

(MX Series routers only) Clear L2TP sessions on LAC and LNS.

**NOTE:** On MX Series routers, you cannot issue the `clear services l2tp session` command in parallel with statistics-related `show services l2tp` commands from separate terminals. If this `clear` command is running, then you must press `Ctrl+c` to make the command run in the background before issuing any of the `show` commands listed in the following table:

<code>show services l2tp destination extensive</code>	<code>show services l2tp summary statistics</code>
<code>show services l2tp destination statistics</code>	<code>show services l2tp tunnel extensive</code>
<code>show services l2tp session extensive</code>	<code>show services l2tp tunnel statistics</code>
<code>show services l2tp session statistics</code>	

## Options

**all** Close all L2TP sessions.

**BEST PRACTICE:** The **all** option is not intended to be used as a means to perform a bulk logout of L2TP subscribers. We recommend that you do not use the **all** option in a production environment. Instead of clearing all subscribers at once, consider clearing subscribers in smaller group, based on interface, tunnel, or destination end point.

**interface *interface-name*** Clear only the L2TP sessions using the specified adaptive services or inline services interface. The interface type depends on the line card as follows:

- *si-fpc/pic/port*—MPCs on MX Series routers only. This option is not available for L2TP on M Series routers.
- *sp-fpc/pic/port*—AS or Multiservices PICs on M7i, M10i, and M120 routers only. This option is not available for L2TP on MX Series routers.

**local-gateway *gateway-address*** Clear only the L2TP sessions associated with the specified local gateway address.

**local-gateway-name *gateway-name*** Clear only the L2TP sessions associated with the specified local gateway name.

<b>local-session-id</b> <i>session-id</i>	Clear only the L2TP sessions with this identifier for the local endpoint of the L2TP session.
<b>local-tunnel-id</b> <i>tunnel-id</i>	Clear only the L2TP sessions associated with the specified local tunnel identifier.
<b>peer-gateway</b> <i>gateway-address</i>	Clear only the L2TP sessions associated with the peer gateway with the specified address.
<b>peer-gateway-name</b> <i>gateway-name</i>	Clear only the L2TP sessions associated with the peer gateway with the specified name.
<b>routing-instance</b> <i>routing-instance-name</i>	Clear only the L2TP sessions associated with the specified routing instance.
<b>tunnel-group</b> <i>group-name</i>	Clear only the L2TP sessions associated with the specified tunnel group. This option is not available for L2TP LAC on MX Series routers.
<b>user</b> <i>username</i>	(M Series routers only) Clear only the L2TP sessions for the specified username.

## Required Privilege Level

clear

## Output Fields

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

## Sample Output

**clear services l2tp session**

```
user@host> clear services l2tp session 31694
Session 31694 closed
```

# Sample Output

clear services l2tp session interface

```

user@host> show services l2tp session Tunnel local ID: 17185
Local  Remote  State          Interface      Interface
ID     ID
5117   1          Established    1073741828     si-2/0/0
34915  2          Established    1073741829     si-2/1/0
6454   3          Established    1073741830     si-2/0/0
46142  4          Established    1073741831     si-2/1/0

```

command-name

```

user@host> clear services l2tp session interface si-2/0/0
Session 5117 closed
Session 6454 closed

```

command-name

```

user@host> show services l2tp session Tunnel local ID: 17185
Local  Remote  State          Interface      Interface
ID     ID
34915  2          Established    1073741829     si-2/1/0
46142  4          Established    1073741831     si-2/1/0

```

# Release Information

Command introduced before Junos OS Release 7.4.

routing-instance *routing-instance-name* option introduced in Junos OS Release 21.2R1.

## RELATED DOCUMENTATION

[L2TP Services Configuration Overview](#)

[L2TP Minimum Configuration](#)

[clear services l2tp session statistics](#)

*show services l2tp session*

## clear services l2tp tunnel statistics

### IN THIS SECTION

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### Syntax

```
clear services l2tp tunnel statistics (all | interface sp-fpc/pic/port | local-gateway gateway-
address | local-gateway-name gateway-name | local-tunnel-id tunnel-id | peer-gateway gateway-
address | peer-gateway-name gateway-name | tunnel-group group-name)
```

### Description

(M10i and M7i routers: LNS only. MX Series routers: LAC only.) Clear statistics for Layer 2 Tunneling Protocol (L2TP) tunnels.

## Options

<b>all</b>	Clear statistics for all L2TP tunnels.
<b>interface <i>sp-fpc/pic/port</i></b>	Clear statistics for only the L2TP tunnels using the specified adaptive services interface. This option is not available for L2TP LAC on MX Series routers.
<b>local-gateway <i>gateway-address</i></b>	Clear statistics for only the L2TP tunnels associated with the local gateway with the specified address.
<b>local-gateway-name <i>gateway-name</i></b>	Clear statistics for only the L2TP tunnels associated with the local gateway with the specified name.
<b>local-tunnel-id <i>tunnel-id</i></b>	Clear statistics for only the L2TP tunnels that have the specified local tunnel identifier.
<b>peer-gateway <i>gateway-address</i></b>	Clear statistics for only the L2TP tunnels associated with the peer gateway with the specified address.
<b>peer-gateway-name <i>gateway-name</i></b>	Clear statistics for only the L2TP tunnels associated with the peer gateway with the specified name.
<b>tunnel-group <i>group-name</i></b>	Clear statistics for only the L2TP tunnels in the specified tunnel group. This option is not available for L2TP LAC on MX Series routers.

## Required Privilege Level

clear

## Output Fields

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

## Sample Output

**clear services l2tp tunnel statistics all**

```
user@host> clear services l2tp tunnel statistics all
Tunnel 9933 statistics cleared
```

## Release Information

Command introduced before Junos OS Release 7.4.

Support for MX Series routers added in Junos OS Release 10.4.

### RELATED DOCUMENTATION

---

[L2TP Services Configuration Overview](#)

---

[L2TP Minimum Configuration](#)

---

[clear services l2tp tunnel](#)

---

[show services l2tp tunnel](#)

## show services l2tp radius

### IN THIS SECTION

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## Syntax

```
show services l2tp radius
<accounting (servers | statistics)>
<authentication (servers | statistics)>
<servers>
<statistics>
```

## Description

(M7i, M10i, and M120 routers only) Display RADIUS servers and statistics information for the RADIUS servers configured on the router.

## Options

You must include one of the following keywords to provide a valid completion for the command:

<b>accounting (servers   statistics)</b>	(Optional) Display RADIUS servers or statistical accounting information only.
<b>authentication (servers   statistics)</b>	(Optional) Display RADIUS servers or statistical authentication information only.
<b>servers</b>	(Optional) Display RADIUS authentication and accounting server information only.
<b>statistics</b>	(Optional) Display RADIUS authentication and accounting statistics information only.

## Required Privilege Level

view

## Output Fields

Table 5 on page 249 lists the output fields for the `show services l2tp radius` command. Output fields are listed in the approximate order in which they appear.

**Table 5: show services l2tp radius Output Fields**

Field Name	Field Description
IP Address	IP address of the server.
State	(servers keyword only) Present state of the server.
UDP Port	Number of the UDP port used to send authentication or accounting messages to the server.
Retry Count	(servers keyword only) Number of times the RADIUS client resends a packet if no ACK is received.
Timeout	(servers keyword only) Length of time the client waits for an ACK before retransmission.
Pending Requests	(servers keyword only) Number of client pending authentication or accounting requests.
Maximum Sessions	(servers keyword only) Maximum number of pending requests on each RADIUS client before the server moves to the next RADIUS client, which is 200 times the maximum number of clients that can be created on a server (which is 12).
Dead Time	(servers keyword only) Interval to wait before retrying a server after it fails to send a response to an authentication or accounting request.
Secret Type	(servers keyword only) Secret type configured on the RADIUS server.

**Table 5: show services l2tp radius Output Fields (Continued)**

Field Name	Field Description
Profile	(servers keyword only) Name of profile configured for the RADIUS server.
Access requests	(statistics keyword only) Number of access requests sent to the server.
Rollover requests	(statistics keyword only) Number of requests coming into the server as a result of the previous server timing out.
Retransmissions	(statistics keyword only) Number of retransmissions.
Access accepts	(statistics keyword only) Number of access accept messages received from the server.
Access rejects	(statistics keyword only) Number of access reject messages received from the server.
Access challenges	(statistics keyword only) Number of access challenges received from the server.
Malformed responses	(statistics keyword only) Number of responses with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).
Bad authenticators	(statistics keyword only) Number of responses in which the authenticator is incorrect for the matching request. This can occur if the RADIUS secrets for the client and server do not match.
Requests pending	(statistics keyword only) Number of requests waiting for a response.
Request timeouts	(statistics keyword only) Number of requests that timed out.
Unknown responses	(statistics keyword only) Number of unknown responses. The RADIUS response type in the header is invalid or unsupported.

Table 5: show services l2tp radius Output Fields *(Continued)*

Field Name	Field Description
Packets dropped	(statistics keyword only) Number of packets dropped because they are too short or because the router receives a response for which there is no corresponding request. For example, if the router sends a request that times out, the router removes the request from the list and sends a new request. If the server is slow and sends a response to the first request after the router removes the request, the packet is dropped.

## Sample Output

### show services l2tp radius servers

```
user@host> show services l2tp radius servers
```

#### RADIUS Authentication Servers

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
192.0.2.1	Active	1812	2	25	0	2400	300	radius-key
198.51.100.1	Active	1812	5	35	0	2400	300	radius-key
203.0.113.1	Active	1812	2	25	0	2400	300	radius-key
172.28.30.174	Active	1812	7	75	0	2400	300	radius-key
172.28.30.175	Active	1812	7	75	0	2400	300	radius-key
172.28.30.176	Active	1812	4	55	0	2400	300	radius-key
172.31.30.176	Active	1812	3	3	0	2400	300	none-set
172.31.130.174	Active	1812	7	75	0	2400	300	radius-key

#### RADIUS Accounting Servers

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
192.0.2.1	Active	1813	2	25	0	2400	300	radius-key
198.51.100.1	Active	1813	5	35	0	2400	300	radius-key
203.0.113.1	Active	1813	2	25	0	2400	300	radius-key
172.28.30.174	Active	1813	7	75	0	2400	300	radius-key
172.28.30.175	Active	1813	7	75	0	2400	300	radius-key
172.28.30.176	Active	1813	4	55	0	2400	300	radius-key

172.31.30.176	Active	1813	3	3	0	2400	300	none-set
172.31.130.174	Active	1813	7	75	0	2400	300	radius-key

#### RADIUS Accounting Servers

Profile: user1

### show services l2tp radius statistics

```
user@host> show services l2tp radius statistics
```

#### RADIUS Authentication Statistics

##### Authentication statistics:

Server 192.0.2.1, UDP port: 1812

```
Access requests      : 40
Rollover requests   : 5
Retransmissions     : 2
Access accepts      : 39
Access rejects      : 1
Access challenges   : 3
Malformed responses : 0
Bad authenticators  : 0
Requests pending    : 1
Request timeouts    : 0
Unknown responses   : 0
Packets dropped     : 0
```

#### RADIUS Accounting Statistics

##### Accounting statistics:

Server 172.31.130.174, UDP port: 1813

```
Total requests      : 9
Start requests      : 6
Interim requests    : 1
Stop requests       : 2
Rollover requests   : 0
Retransmissions     : 1
Total response      : 9
Start responses     : 6
Interim responses   : 1
Stop responses      : 2
```

```
Malformed responses : 0
Bad authenticators  : 0
Requests pending    : 1
Request timeouts    : 0
Unknown responses   : 0
Packets dropped     : 0
```

## Release Information

Command introduced in Junos OS Release 9.0.

### RELATED DOCUMENTATION

[L2TP Services Configuration Overview](#)

[L2TP Minimum Configuration](#)

# 6

CHAPTER

## Monitoring Commands

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`show services l2tp session` | 255

`show services l2tp radius` | 267

`show services l2tp summary` | 273

---

# show services l2tp session

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## Syntax

```
show services l2tp session
<brief | detail | extensive>
<interface interface-name>
<local-gateway gateway-address>
<local-gateway-name gateway-name>
<local-session-id session-id>
<local-tunnel-id tunnel-id>
<peer-gateway gateway-address>
<peer-gateway-name gateway-name>
<statistics>
<tunnel-group group-name>
<user username>
```

## Description

(M10i and M7i routers only) Display information about active L2TP sessions for LNS.

(MX Series routers only) Display information about active L2TP sessions for LAC and LNS.



## Options

<b>none</b>	Display standard information about all active L2TP sessions.
<b>brief   detail   extensive</b>	(Optional) Display the specified level of output.
<b>interface <i>interface-name</i></b>	<p>(Optional) Display L2TP session information for only the specified adaptive services or inline services interface. The interface type depends on the line card as follows:</p> <ul style="list-style-type: none"> <li>• <i>si-fpc/pic/port</i>— MPCs on MX Series routers only. This option is not available for L2TP on M Series routers.</li> <li>• <i>sp-fpc/pic/port</i>— AS or Multiservices PICs on M7i, M10i, and M120 routers only. This option is not available for L2TP on MX Series routers.</li> </ul>
<b>local-gateway <i>gateway-address</i></b>	(Optional) Display L2TP session information for only the specified local gateway address.
<b>local-gateway-name <i>gateway-name</i></b>	(Optional) Display L2TP session information for only the specified local gateway name.
<b>local-session-id <i>session-id</i></b>	(Optional) Display L2TP session information for only the specified local session identifier.
<b>local-tunnel-id <i>tunnel-id</i></b>	(Optional) Display L2TP session information for only the specified local tunnel identifier.
<b>peer-gateway <i>gateway-address</i></b>	(Optional) Display L2TP session information for only the specified peer gateway address.
<b>peer-gateway-name <i>gateway-name</i></b>	(Optional) Display L2TP session information for only the specified peer gateway name.
<b>statistics</b>	(Optional) Display the number of control packets and bytes transmitted and received for the session. You cannot include this option with any of the level options, brief, detail, or extensive.
<b>tunnel-group <i>group-name</i></b>	(Optional) Display L2TP session information for only the specified tunnel group. To display information about L2TP CPU and memory usage, you can include the tunnel group name in the <code>show services service-sets memory-usage <i>group-name</i></code> and <code>show services service-sets cpu-usage <i>group-name</i></code> commands. This option is not available for L2TP LAC on MX Series routers.

**user *username*** (M Series routers only) (Optional) Display L2TP session information for only the specified username.

## Required Privilege Level

view

## Output Fields

Table 6 on page 257 lists the output fields for the `show services l2tp session` command. Output fields are listed in the approximate order in which they appear.

**Table 6: show services l2tp session Output Fields**

Field Name	Field Description	Level of Output
Interface	(LNS only) Name of an adaptive services interface.	All levels
Tunnel group	(LNS only) Name of a tunnel group.	All levels
Tunnel local ID	Identifier of the local endpoint of the tunnel, as assigned by the L2TP network server (LNS).	All levels
Session local ID	Identifier of the local endpoint of the L2TP session, as assigned by the LNS.	All levels
Session remote ID	Identifier of the remote endpoint of the L2TP session, as assigned by the L2TP access concentrator (LAC).	All levels

**Table 6: show services l2tp session Output Fields (Continued)**

Field Name	Field Description	Level of Output
State	<p>State of the L2TP session:</p> <ul style="list-style-type: none"> <li>Established—Session is operating. This is the only state supported for the LAC.</li> <li>closed—Session is being closed.</li> <li>destroyed—Session is being destroyed.</li> <li>clean-up—Session is being cleaned up.</li> <li>lns-ic-accept-new—New session is being accepted.</li> <li>lns-ic-idle—Session has been created and is idle.</li> <li>lns-ic-reject-new—New session is being rejected.</li> <li>lns-ic-wait-connect—Session is waiting for the peer's incoming call connected (ICCN) message.</li> </ul>	All levels
Bundle ID	(LNS only) Bundle identifier. Indicates the session is part of a multilink bundle. Sessions that have a blank Bundle field are not participating in the Multilink Protocol. Sessions in a multilink bundle might belong to different L2TP tunnels. For L2TP output organized by bundle ID, issue the show services l2tp multilink extensive command.	All levels
Mode	<p>(LNS) Mode of the interface representing the session: shared or exclusive.</p> <p>(LAC) Mode of the interface representing the session: shared or dedicated. Only dedicated is currently supported for the LAC.</p>	extensive
Local IP	IP address of local endpoint of the Point-to-Point Protocol (PPP) session.	extensive
Remote IP	IP address of remote endpoint of the PPP session.	extensive
Username	(LNS only) Name of the user logged in to the session.	All levels

**Table 6: show services l2tp session Output Fields (Continued)**

Field Name	Field Description	Level of Output
Assigned IP address	(LNS only) IP address assigned to remote client.	extensive
Local name	For LNS, name of the LNS instance in which the session was created. For LAC, name of the LAC.	extensive
Remote name	For LNS, name of the LAC from which the session was created. For LAC, name of the LAC instance.	extensive
Local MRU	(LNS only) Maximum receive unit (MRU) setting of the local device, in bytes.	extensive
Remote MRU	(LNS only) MRU setting of the remote device, in bytes.	extensive
Tx speed	<p>Transmit speed of the session conveyed from the LAC to the LNS, in bits per second (bps) and the source method from which the speed is derived.</p> <p>Starting in Junos OS Release 14.1, either the initial (initial) line speed or both the initial and current (update) line speeds can be displayed on MX Series routers:</p> <ul style="list-style-type: none"> <li>• When connection speed updates are not enabled, then only the initial line speed is displayed.</li> <li>• When connection speed updates are enabled, then both the initial and the current speeds are displayed.</li> </ul> <p>For Junos OS Release 17.2 and Release 17.3, only the current (update) line speed can be displayed on MX Series routers.</p> <p>Starting in Junos OS Release 17.4R1, once again either the initial (initial) line speed or both the initial and current (update) line speeds can be displayed on MX Series routers.</p> <p>Starting in Junos OS Release 15.1, when the Tx connect speed method is set to none, the value of zero (0) is displayed.</p>	extensive

**Table 6: show services l2tp session Output Fields (Continued)**

Field Name	Field Description	Level of Output
Rx speed	<p>Receive speed of the session conveyed from the LAC to the LNS, in bits per second (bps) and the source method from which the speed is derived.</p> <p>Starting in Junos OS Release 14.1, either the initial (initial) line speed or both the initial and current (update) line speeds can be displayed on MX Series routers:</p> <ul style="list-style-type: none"> <li>• When connection speed updates are not enabled, then only the initial line speed is displayed.</li> <li>• When connection speed updates are enabled, then both the initial and the current speeds are displayed.</li> </ul> <p>For Junos OS Release 17.2 and Release 17.3, only the current (update) line speed can be displayed on MX Series routers.</p> <p>Starting in Junos OS Release 17.4R1, once again either the initial (initial) line speed or both the initial and current (update) line speeds can be displayed on MX Series routers.</p> <p>Starting in Junos OS Release 15.1, when the Tx connect speed method is set to none, the value of zero (0) is displayed.</p>	extensive
Bearer type	<p>Type of bearer enabled:</p> <ul style="list-style-type: none"> <li>• 0—Might indicate that the call was not received over a physical link (for example, when the LAC and PPP are located in the same subsystem).</li> <li>• 1—Digital access requested.</li> <li>• 2—Analog access requested.</li> <li>• 4—Asynchronous Transfer Mode (ATM) bearer support.</li> </ul>	extensive
Framing type	<p>Type of framing enabled:</p> <ul style="list-style-type: none"> <li>• 1—Synchronous framing</li> <li>• 2—Asynchronous framing</li> </ul>	extensive

**Table 6: show services l2tp session Output Fields (Continued)**

Field Name	Field Description	Level of Output
LCP renegotiation	(LNS only) Whether Link Control Protocol (LCP) renegotiation is configured: On or Off.	extensive
Authentication	Type of authentication algorithm used: Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP).	extensive
Interface ID	(LNS only) Identifier used to look up the logical interface for this session.	extensive
Interface unit	Logical interface for this session.	All levels
Call serial number	Unique serial number assigned to the call.	extensive
Policer bandwidth	Maximum policer bandwidth configured for this session.	extensive
Policer burst size	Maximum policer burst size configured for this session.	extensive
Firewall filter	Configured firewall filter name.	extensive
Session encapsulation overhead	Overhead allowance configured for this session, in bytes.	extensive
Session cell overhead	Cell overhead activation (On or Off).	extensive
Create time	Date and time when the call was created.	extensive

**Table 6: show services l2tp session Output Fields (Continued)**

Field Name	Field Description	Level of Output
Up time	Length of time elapsed since the call became active, in hours, minutes, and seconds.	extensive
Idle time	Length of time elapsed since the call became idle, in hours, minutes, and seconds.	extensive
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> <li>• Control Tx—Amount of control information transmitted, in packets and bytes.</li> <li>• Control Rx—Amount of control information received, in packets and bytes.</li> <li>• Data Tx—Amount of data transmitted, in packets and bytes.</li> <li>• Data Rx—Amount of data received, in packets and bytes.</li> <li>• Errors Tx—Number of errors transmitted, in packets.</li> <li>• Errors Rx—Number of errors received, in packets.</li> <li>• LCP echo req Tx—Number of LCP echo requests transmitted, in packets.</li> <li>• LCP echo req Rx—Number of LCP echo requests received, in packets.</li> <li>• LCP echo rep Tx—Number of LCP echo responses transmitted, in packets.</li> <li>• LCP echo rep Rx—Number of LCP echo responses received, in packets.</li> <li>• LCP echo Req timeout—Number of LCP echo requests that timed out.</li> <li>• LCP echo Req error—Number of errors received for LCP echo packets.</li> <li>• LCP echo Rep error —Number of errors transmitted for LCP echo packets.</li> </ul>	extensive

## Sample Output

### show services l2tp session (LNS on M Series Routers)

```
user@host> show services l2tp session
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 8802
  Local Remote Interface State          Bundle Username
  ID    ID    unit
  37966    5      2 Established
```

### show services l2tp session (LNS on MX Series Routers)

```
user@host> show services l2tp session
Tunnel local ID: 40553
  Local Remote State          Interface          Interface
  ID    ID                  unit              Name
  17967  1      Established      1073749824      si-5/2/0
```

### show services l2tp session (LAC)

```
user@host> show services l2tp session
Tunnel local ID: 31889
  Local Remote State          Interface          Interface
  ID    ID                  unit              Name
  31694    1      Established      311              pp0
```

### show services l2tp session detail (LAC)

```
user@host> show services l2tp session detail
Tunnel local ID: 31889
  Session local ID: 31694, Session remote ID: 1, Interface unit: 311
  State: Established, Interface: pp0, Mode: Dedicated
  Local IP: 203.0.113.2:1701, Remote IP: 203.0.113.1:1701
  Local name: ce-lac, Remote name: ce-lns
```



**show services l2tp session extensive (LAC)**

```

user@host> show services l2tp session extensive
Tunnel local ID: 31889
  Session local ID: 31694, Session remote ID:      1
    Interface unit: 311
    State: Established, Mode: Dedicated
    Local IP: 203.0.113.2:1701, Remote IP: 203.0.113.1:1701
    Local name: ce-lac, Remote name: ce-lns
    Tx speed: 0, Rx speed: 0
    Bearer type: 1, Framing type: 1
    LCP renegotiation: N/A, Authentication: None, Interface ID: N/A
    Interface unit: 311, Call serial number: 0
    Policer bandwidth: 0, Policer burst size: 0
    Policer exclude bandwidth: 0, Firewall filter: 0
    Session encapsulation overhead: 0, Session cell overhead: 0
    Create time: Tue Aug 24 14:38:23 2010, Up time: 01:06:25
    Idle time: N/A

```

**show services l2tp session extensive (LAC on MX Series Routers)**

```

user@host> show services l2tp session extensive
Tunnel local ID: 31889
  Session local ID: 31694, Session remote ID:      1
    Interface unit: 311
    State: Established, Mode: Dedicated
    Local IP: 203.0.113.102:1701, Remote IP: 203.0.113.101:1701
    Local name: ce-lac, Remote name: ce-lns
    Tx speed: 256000, source service-profile
    Rx speed: 128000, source ancp
    Bearer type: 1, Framing type: 1
    LCP renegotiation: N/A, Authentication: None, Interface ID: N/A
    Interface unit: 311, Call serial number: 0
    Policer bandwidth: 0, Policer burst size: 0
    Policer exclude bandwidth: 0, Firewall filter: 0
    Session encapsulation overhead: 0, Session cell overhead: 0
    Create time: Tue Aug 24 14:38:23 2010, Up time: 01:06:25
    Idle time: N/A

```

**show services l2tp session extensive (LNS on M Series Routers)**

```

user@host> show services l2tp session extensive
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 62746
Session local ID: 56793, Session remote ID: 53304
State: Established, Bundle ID: 5, Mode: shared
Local IP: 203.0.113.121:1701, Remote IP: 203.0.113.202:1701
Username: user@example.com, Assigned IP address: 203.0.113.51/32
Local MRU: 4000, Remote MRU: 1500, Tx speed: 64000, Rx speed: 64000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_20
Interface unit: 20, Call serial number: 4137941434
Policer bandwidth: 64000, Policer burst size: 51200
Firewall filter: f1
Session encapsulation overhead: 16, Session cell overhead: On
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:16:41
Idle time: 00:00:00
Statistics since: Tue Mar 23 14:13:13 2004

```

	Packets	Bytes
Control Tx	4	88
Control Rx	2	28
Data Tx	0	0
Data Rx	461	29.0k
Errors Tx	0	
Errors Rx	0	

```

Interface: sp-1/2/0, Tunnel group: group_company_dns, Tunnel local ID: 37266
Session local ID: 39962, Session remote ID: 53303
State: Established, Bundle ID: 5, Mode: shared
Local IP: 203.0.113.121:1701, Remote IP: 203.0.113.222:1701
Username: usr1@company.example.com, Assigned IP address: 203.0.113.3/24
Local name: router-1, Remote name: router-2
Local MRU: 4470, Remote MRU: 4470, Tx speed: 155000000, Rx speed: 155000000
Bearer type: 2, Framing type: 1
LCP renegotiation: Off, Authentication: CHAP, Interface ID: unit_31
Interface unit: 31, Call serial number: 4137941433
Policer bandwidth: 64000, Policer burst size: 51200
Firewall filter: f1
Create time: Tue Mar 23 14:13:17 2004, Up time: 01:16:39
Idle time: 01:16:36
Statistics since: Tue Mar 23 14:13:15 2004

```

	Packets	Bytes
--	---------	-------

Control Tx	6	196
Control Rx	4	150
Data Tx	0	0
Data Rx	1	80
Errors Tx	0	
Errors Rx	0	

### show services l2tp session extensive (LNS on MX Series Routers)

```

user@host> show services l2tp session extensive
Tunnel local ID: 40553
  Session local ID: 17967, Session remote ID: 1
    Interface unit: 1073749824
    State: Established
    Interface: si-5/2/0
    Mode: Dedicated
    Local IP: 192.0.2.2:1701, Remote IP: 192.0.2.3:1701
    Local name: lns-mx960, Remote name: testlac
    Tx speed: initial 64000, Update 256000
    Rx speed: initial 64000, Update 256000
    Bearer type: 2, Framing type: 1
    LCP renegotiation: Off, Authentication: None
    Call serial number: 1
    Create time: Mon Apr 25 20:27:50 2011, Up time: 00:01:48
    Idle time: N/A
    Statistics since: Mon Apr 25 20:27:50 2011
      Packets      Bytes
    Control Tx      4      219
    Control Rx      4      221
    Data Tx         0         0
    Data Rx        10      228
    Errors Tx       0
    Errors Rx       0

```

### show services l2tp session statistics (MX Series Routers)

```

user@host> show services l2tp session statistics local session-id 1
Tunnel local ID: 17185
  Session local ID: 1, Session remote ID: 14444, Interface unit: 1073788352
  State: Established

```

Statistics since: Mon Aug 1 13:27:47 2011		
	Packets	Bytes
Data Tx	4	51
Data Rx	3	36

## Release Information

Command introduced before Junos OS Release 7.4.

Support for LAC on MX Series routers introduced in Junos OS Release 10.4.

Support for LNS on MX Series routers introduced in Junos OS Release 11.4.

### RELATED DOCUMENTATION

[L2TP Services Configuration Overview](#)

[L2TP Minimum Configuration](#)

*clear services l2tp session*

# show services l2tp radius

### IN THIS SECTION

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## Syntax

```
show services l2tp radius
<accounting (servers | statistics)>
<authentication (servers | statistics)>
<servers>
<statistics>
```

## Description

(M7i, M10i, and M120 routers only) Display RADIUS servers and statistics information for the RADIUS servers configured on the router.

## Options

You must include one of the following keywords to provide a valid completion for the command:

<b>accounting (servers   statistics)</b>	(Optional) Display RADIUS servers or statistical accounting information only.
<b>authentication (servers   statistics)</b>	(Optional) Display RADIUS servers or statistical authentication information only.
<b>servers</b>	(Optional) Display RADIUS authentication and accounting server information only.
<b>statistics</b>	(Optional) Display RADIUS authentication and accounting statistics information only.

## Required Privilege Level

view

## Output Fields

Table 7 on page 269 lists the output fields for the `show services l2tp radius` command. Output fields are listed in the approximate order in which they appear.

**Table 7: show services l2tp radius Output Fields**

Field Name	Field Description
IP Address	IP address of the server.
State	(servers keyword only) Present state of the server.
UDP Port	Number of the UDP port used to send authentication or accounting messages to the server.
Retry Count	(servers keyword only) Number of times the RADIUS client resends a packet if no ACK is received.
Timeout	(servers keyword only) Length of time the client waits for an ACK before retransmission.
Pending Requests	(servers keyword only) Number of client pending authentication or accounting requests.
Maximum Sessions	(servers keyword only) Maximum number of pending requests on each RADIUS client before the server moves to the next RADIUS client, which is 200 times the maximum number of clients that can be created on a server (which is 12).
Dead Time	(servers keyword only) Interval to wait before retrying a server after it fails to send a response to an authentication or accounting request.
Secret Type	(servers keyword only) Secret type configured on the RADIUS server.
Profile	(servers keyword only) Name of profile configured for the RADIUS server.
Access requests	(statistics keyword only) Number of access requests sent to the server.

**Table 7: show services l2tp radius Output Fields (Continued)**

Field Name	Field Description
Rollover requests	(statistics keyword only) Number of requests coming into the server as a result of the previous server timing out.
Retransmissions	(statistics keyword only) Number of retransmissions.
Access accepts	(statistics keyword only) Number of access accept messages received from the server.
Access rejects	(statistics keyword only) Number of access reject messages received from the server.
Access challenges	(statistics keyword only) Number of access challenges received from the server.
Malformed responses	(statistics keyword only) Number of responses with attributes having an invalid length or unexpected attributes (such as two attributes when the response is required to have at most one).
Bad authenticators	(statistics keyword only) Number of responses in which the authenticator is incorrect for the matching request. This can occur if the RADIUS secrets for the client and server do not match.
Requests pending	(statistics keyword only) Number of requests waiting for a response.
Request timeouts	(statistics keyword only) Number of requests that timed out.
Unknown responses	(statistics keyword only) Number of unknown responses. The RADIUS response type in the header is invalid or unsupported.
Packets dropped	(statistics keyword only) Number of packets dropped because they are too short or because the router receives a response for which there is no corresponding request. For example, if the router sends a request that times out, the router removes the request from the list and sends a new request. If the server is slow and sends a response to the first request after the router removes the request, the packet is dropped.

## Sample Output

### show services l2tp radius servers

```
user@host> show services l2tp radius servers
```

#### RADIUS Authentication Servers

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
192.0.2.1	Active	1812	2	25	0	2400	300	radius-key
198.51.100.1	Active	1812	5	35	0	2400	300	radius-key
203.0.113.1	Active	1812	2	25	0	2400	300	radius-key
172.28.30.174	Active	1812	7	75	0	2400	300	radius-key
172.28.30.175	Active	1812	7	75	0	2400	300	radius-key
172.28.30.176	Active	1812	4	55	0	2400	300	radius-key
172.31.30.176	Active	1812	3	3	0	2400	300	none-set
172.31.130.174	Active	1812	7	75	0	2400	300	radius-key

#### RADIUS Accounting Servers

IP Address	State	UDP Port	Retry Count	Timeout	Pending Requests	Maximum Sessions	Dead Time	Secret Type
192.0.2.1	Active	1813	2	25	0	2400	300	radius-key
198.51.100.1	Active	1813	5	35	0	2400	300	radius-key
203.0.113.1	Active	1813	2	25	0	2400	300	radius-key
172.28.30.174	Active	1813	7	75	0	2400	300	radius-key
172.28.30.175	Active	1813	7	75	0	2400	300	radius-key
172.28.30.176	Active	1813	4	55	0	2400	300	radius-key
172.31.30.176	Active	1813	3	3	0	2400	300	none-set
172.31.130.174	Active	1813	7	75	0	2400	300	radius-key

#### RADIUS Accounting Servers

Profile: user1

### show services l2tp radius statistics

```
user@host> show services l2tp radius statistics
```

#### RADIUS Authentication Statistics



## Authentication statistics:

Server 192.0.2.1, UDP port: 1812

```

Access requests      : 40
Rollover requests   : 5
Retransmissions     : 2
Access accepts      : 39
Access rejects      : 1
Access challenges    : 3
Malformed responses : 0
Bad authenticators   : 0
Requests pending    : 1
Request timeouts    : 0
Unknown responses    : 0
Packets dropped      : 0

```

## RADIUS Accounting Statistics

## Accounting statistics:

Server 172.31.130.174, UDP port: 1813

```

Total requests       : 9
Start requests       : 6
Interim requests     : 1
Stop requests        : 2
Rollover requests    : 0
Retransmissions      : 1
Total response       : 9
Start responses      : 6
Interim responses    : 1
Stop responses       : 2
Malformed responses  : 0
Bad authenticators   : 0
Requests pending     : 1
Request timeouts     : 0
Unknown responses    : 0
Packets dropped      : 0

```

## Release Information

Command introduced in Junos OS Release 9.0.

## RELATED DOCUMENTATION

[L2TP Services Configuration Overview](#)

[L2TP Minimum Configuration](#)

# show services l2tp summary

## IN THIS SECTION

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## Syntax

```
show services l2tp summary  
<interface sp-fpc/pic/port>  
<statistics>
```

## Description

(M10i and M7i routers: LNS only. MX Series routers: LAC and LNS.) Display Layer 2 Tunneling Protocol (L2TP) summary information.

## Options

<b>none</b>	Display complete L2TP summary information. For LNS on M Series routers, display L2TP summary information for all adaptive services interfaces. For LNS on MX Series routers, display L2TP summary information for all inline services interfaces.
<b>interface sp-fpc/pic/port</b>	(Optional) Display L2TP summary information for only the specified adaptive services interface. This option is not available for L2TP on MX Series routers.
<b>statistics</b>	(Optional) Display a summary of control packets and bytes transmitted and received.

## Required Privilege Level

view

## Output Fields

[Table 8 on page 274](#) lists the output fields for the `show services l2tp summary` command. Output fields are listed in the approximate order in which they appear.

**Table 8: show services l2tp summary Output Fields**

Field Name	Field Description
Administrative state	Administrative state of the tunnel is drain. In this state you cannot configure new sessions, destinations, or tunnels at the LAC or LNS.
Failover within a preference level	State of this tunnel selection method on the LAC. When enabled, tunnel selection fails over within a preference level. When disabled, tunnel selection drops to the next lower preference level. Not displayed for LNS on M Series routers.

Table 8: show services l2tp summary Output Fields (Continued)

Field Name	Field Description
Weighted load balancing	State of this tunnel selection method on the LAC. When enabled, the maximum session limit of a tunnel determines its weight within a preference level. Tunnel selection proceeds from greatest to least weight. When disabled, selection defaults to a round robin method. Not displayed for LNS on M Series routers.
Destination equal load balancing	State of this tunnel selection method on the LAC. When enabled, the LAC selects tunnels based on the session count for destinations and the tunnel session count. Not displayed for LNS on M Series routers.
Tunnel authentication challenge	State of tunnel authentication, indicating whether the LAC and LNS exchange an authentication challenge and response during the establishment of the tunnel. The state is Enabled when a secret is configured in the tunnel profile or on the RADIUS server in the Tunnel-Password attribute [69]. The state is Disabled when the secret is not present. Not displayed for LNS on M Series routers.
Calling number avp	When the state is Enabled, the LAC includes the value of the Calling Number AVP 22 in ICRQ packets sent to the LNS. When the state is Disabled, the attribute is not sent to the LNS. Not displayed for LNS on M Series routers.
Failover Protocol	When the state is enabled, the LAC operates in the default <i>failover-protocol-fall-back-to-silent-failover</i> manner. When the state is disabled, the <i>disable-failover-protocol</i> statement has been issued and the LAC operates only in silent failover mode. Not displayed for LNS on M Series routers.

Table 8: show services l2tp summary Output Fields (*Continued*)

Field Name	Field Description
Tx connect speed method	<p>The connection speed method configured to send the speed values in the L2TP Tx Connect Speed (AVP 24) and L2TP Rx Connect Speed (AVP 38). Possible values are:</p> <ul style="list-style-type: none"> <li>• actual</li> </ul> <p>This is the default value in Junos OS Releases 15.1, 16.1, 16.2, and 17.1. It is deprecated in Junos Releases 17.2 and higher.</p> <ul style="list-style-type: none"> <li>• ancp</li> <li>• none</li> <li>• pppoe-ia-tag</li> <li>• service-profile</li> <li>• static</li> </ul> <p>This is the default value in Junos Releases 13.3, 14.1, 14.2, 17.2 and higher. It is deprecated in Junos OS Releases 15.1, 16.1, 16.2, and 17.1.</p>
Rx speed avp when equal	<p>Indicates if the Rx connect speed when equal configuration is enabled or disabled.</p>
Tunnel assignment id	<p>Format of the tunnel name.</p> <p>Format of the tunnel name, based on RADIUS attributes returned from the AAA server:</p> <ul style="list-style-type: none"> <li>• authentication-id—Name consists of only Tunnel Assignment-Id [82]. This is the default value.</li> <li>• client-server-id—Name is a combination of Tunnel-Client-Auth-Id [90], Tunnel-Server-Endpoint [67], and Tunnel-Assignment-Id [82]. This format is available only on MX Series routers.</li> </ul>

**Table 8: show services l2tp summary Output Fields (Continued)**

Field Name	Field Description
Tunnel Tx Address Change	<p>Action taken by LAC when it receives a request from a peer to change the destination IP address, UDP port, or both:</p> <ul style="list-style-type: none"> <li>• <b>accept</b>—Accepts change requests for the IP address or UDP port. This is the default action.</li> <li>• <b>ignore</b>—Ignores all change requests.</li> <li>• <b>ignore-ip-address</b>—Ignores change requests for the IP address but accepts them for the UDP port.</li> <li>• <b>ignore-udp-port</b>—Ignores change requests for the UDP port but accepts them for the IP address.</li> </ul>
Min Retransmission Timeout for control packets	Minimum number of seconds that the local peer waits for the initial response after transmitting an L2TP control packet. If no response has been received by the time the period expires, the local peer retransmits the packet.
Min Retransmission Timeout for control packets	Minimum number of seconds that the local peer waits for the initial response after transmitting an L2TP control packet. If no response has been received by the time the period expires, the local peer retransmits the packet.
Max Retransmissions for Established Tunnel	Maximum number of times control messages are retransmitted for established tunnels.
Max Retransmissions for Not Established Tunnel	Maximum number of times control messages are retransmitted for tunnels that are not established.
Tunnel Idle Timeout	Period that a tunnel can be inactive—that is, carrying no traffic—before it times out and is torn down.
Destruct Timeout	Period that the router attempts to maintain dynamic destinations, tunnels, and sessions after they have been destroyed.
Reassembly Service Set	Indicates active IP reassembly configured for the interface.

**Table 8: show services l2tp summary Output Fields (Continued)**

Field Name	Field Description
Destination Lockout Timeout	Timeout period for which all future destinations are locked out, meaning that they are not considered for selection when a new tunnel is created.
Access Line Information	<p>State of LAC global configuration for forwarding subscriber line information to the LNS, Enabled or Disabled.</p> <p>Indicates active IP reassembly configured for the interface.</p> <p>Starting in Junos OS Release 17.4R1, this information can also be displayed on the LNS for information it receives from the LAC.</p>
IPv6 Services for LAC Sessions	State of LAC IPv6 service configuration for creating the IPv6 (inet6) address family for LAC subscribers, allowing the application of IPv6 firewall filters, Enabled or Disabled.
Speed Updates	<p>State of LAC global configuration for including connection speed updates when it forwards subscriber line information to the LNS, Enabled or Disabled.</p> <p>Starting in Junos OS Release 17.4R1, this information can also be displayed on the LNS for updates it receives from the LAC.</p>
Destinations	Number of L2TP destinations for the LAC. Not displayed for LNS on M Series routers.
Tunnels	Number of L2TP tunnels established on the router.
Sessions	Number of L2TP sessions established on the router.
Switched sessions	Number of L2TP tunnel-switched sessions established on the router.
Control	Count of L2TP control packets and bytes sent and received.
Data	Count of L2TP data packets and bytes sent and received.

**Table 8: show services l2tp summary Output Fields (Continued)**

Field Name	Field Description
Errors	Count of L2TP error packets and bytes sent and received.

## Sample Output

### show services l2tp summary (LAC on M Series routers)

```

user@host> show services l2tp summary
Administrative state is Drain
Failover within a preference level is Disabled
Weighted load balancing is Enabled
Destination equal load balancing is Disabled
Tunnel authentication challenge is Enabled
Calling number avp is Enabled
Failover Protocol is Disabled
Tunnel assignment id format is authentication-id
Destinations: 1 Tunnels: 1, Sessions: 1
      Tx packets    Rx packets    Memory (bytes)
Control    260          144          11513856
Data       7.5k         16.9k          8.3k
Errors      0             0

```

### show services l2tp summary (LAC on MX Series routers)

```

user@host> show services l2tp summary
Administrative state is Drain
      Failover within a preference level is Disabled
Weighted load balancing is Disabled
Destination equal load balancing is Enabled
Tunnel authentication challenge is Enabled
Calling number avp is Enabled
Failover Protocol is Disabled
Tx Connect speed method is static

```



```

Rx speed avp when equal is enabled
Tunnel Tx Address Change is Accept
Min Retransmissions Timeout for control packets is 2 seconds
Max Retransmissions for Established Tunnel is 7
Max Retransmissions for Not Established Tunnel is 5
Tunnel Idle Timeout is 60 seconds
Destruct Timeout is 300 seconds
Destination Lockout Timeout is 300 seconds
Reassembly Service Set is ssnr3
Access Line Information is Enabled, Speed Updates is Enabled
IPv6 Services For LAC Sessions is Enabled
Destinations: 0, Tunnels: 0, Sessions: 0, Switched sessions: 0

```

### **show services l2tp summary (LNS on MX Series routers)**

```

user@host show services l2tp summary
Administrative state is Drain
Failover within a preference level is Disabled
Weighted load balancing is Disabled
Destination equal load balancing is Disabled
Tunnel authentication challenge is Enabled
Calling number avp is Enabled
Failover Protocol is Enabled
Tx Connect speed method is static
reassembly Service Set is ssnr3
Destinations: 4, Tunnels: 19, Sessions: 65, Switched sessions: 2
Access Line Information is Enabled, Speed Updates is Enabled

```

### **show services l2tp summary (LNS on M Series routers)**

```

user@host> show services l2tp summary
Tunnels: 2, Sessions: 2, Errors: 0

```

	Tx packets	Rx packets	Memory (bytes)
Control	6k	9k	688k
Data	70k	70k	3054

## show services l2tp summary statistics (MX Series routers)

```

user@host>show services l2tp summary statistics
Administrative state is Drain
Failover within a preference level is Disabled
Weighted load balancing is Disabled
Destination equal load balancing is Disabled
Tunnel authentication challenge is Enabled
Calling number avp is Enabled
Failover Protocol is Enabled
Tx Connect speed method is advisory
Tunnel assignment id format is assignment-id
Tunnel Tx Address Change is Accept
Min Retransmissions Timeout for control packets is 4 seconds
Max Retransmissions for Established Tunnel is 7
Max Retransmissions for Not Established Tunnel is 5
Tunnel Idle Timeout is 60 seconds
Destruct Timeout is 300 seconds
Destination Lockout Timeout is 300 seconds
Destinations: 1, Tunnels: 1, Sessions: 31815, Switched sessions: 0

```

	Tx packets	Rx packets	Memory (bytes)
Control	90.4k	32.0k	245678080
Data	127.3k	100.8kk	0
Errors	0	0	

## Release Information

Command introduced before Junos OS Release 7.4.

Support for LAC on MX Series routers introduced in Junos OS Release 10.4.

Support for LNS on MX Series routers introduced in Junos OS Release 11.4.

Support for **statistics** option introduced in Junos OS Release 13.1.

## RELATED DOCUMENTATION

[L2TP Services Configuration Overview](#)

[L2TP Minimum Configuration](#)