

Layer 2 Tunneling Protocol



Published: 2013-08-29

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, California 94089
USA
408-745-2000
www.juniper.net

This product includes the Envoy SNMP Engine, developed by Epilogue Technology, an Integrated Systems Company. Copyright © 1986-1997, Epilogue Technology Corporation. All rights reserved. This program and its documentation were developed at private expense, and no part of them is in the public domain.

This product includes memory allocation software developed by Mark Moraes, copyright © 1988, 1989, 1993, University of Toronto.

This product includes FreeBSD software developed by the University of California, Berkeley, and its contributors. All of the documentation and software included in the 4.4BSD and 4.4BSD-Lite Releases is copyrighted by the Regents of the University of California. Copyright © 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994. The Regents of the University of California. All rights reserved.

GateD software copyright © 1995, the Regents of the University. All rights reserved. Gate Daemon was originated and developed through release 3.0 by Cornell University and its collaborators. Gated is based on Kirton's EGP, UC Berkeley's routing daemon (routed), and DCN's HELLO routing protocol. Development of Gated has been supported in part by the National Science Foundation. Portions of the GateD software copyright © 1988, Regents of the University of California. All rights reserved. Portions of the GateD software copyright © 1991, D. L. S. Associates.

This product includes software developed by Maker Communications, Inc., copyright © 1996, 1997, Maker Communications, Inc.

Juniper Networks, Junos, Steel-Belted Radius, NetScreen, and ScreenOS are registered trademarks of Juniper Networks, Inc. in the United States and other countries. The Juniper Networks Logo, the Junos logo, and JunosE are trademarks of Juniper Networks, Inc. All other trademarks, service marks, registered trademarks, or registered service marks are the property of their respective owners.

Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.

Products made or sold by Juniper Networks or components thereof might be covered by one or more of the following patents that are owned by or licensed to Juniper Networks: U.S. Patent Nos. 5,473,599, 5,905,725, 5,909,440, 6,192,051, 6,333,650, 6,359,479, 6,406,312, 6,429,706, 6,459,579, 6,493,347, 6,538,518, 6,538,899, 6,552,918, 6,567,902, 6,578,186, and 6,590,785.

Layer 2 Tunneling Protocol
Copyright © 2013, Juniper Networks, Inc.
All rights reserved.

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

YEAR 2000 NOTICE

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

END USER LICENSE AGREEMENT

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

Table of Contents

	About the Documentation	vii
	Documentation and Release Notes	vii
	Supported Platforms	vii
	Using the Examples in This Manual	vii
	Merging a Full Example	viii
	Merging a Snippet	viii
	Documentation Conventions	ix
	Documentation Feedback	x
	Requesting Technical Support	xi
	Self-Help Online Tools and Resources	xi
	Opening a Case with JTAC	xii
Part 1	Overview	
Chapter 1	Layer 2 Tunneling Protocol	3
	Layer 2 Tunneling Protocol Overview	3
	L2TP Services Configuration Overview	4
	AS PIC Redundancy for L2TP Services	5
Part 2	Configuration	
Chapter 2	Configuration Tasks	9
	L2TP Minimum Configuration	9
	Configuring L2TP Tunnel Groups	11
	Configuring Access Profiles for L2TP Tunnel Groups	12
	Configuring the Local Gateway Address and PIC	13
	Configuring Window Size for L2TP Tunnels	13
	Configuring Timers for L2TP Tunnels	14
	Hiding Attribute-Value Pairs for L2TP Tunnels	14
	Configuring System Logging of L2TP Tunnel Activity	14
	Configuring the Identifier for Logical Interfaces that Provide L2TP Services	16
	Example: Configuring Multilink PPP on a Shared Logical Interface	16
	Tracing L2TP Operations	18
Chapter 3	Example	21
	Examples: Configuring L2TP Services	21
Chapter 4	Configuration Statements	25
	facility-override	25
	hello-interval	26
	hide-avps	27
	host (L2TP)	27

l2tp-access-profile	28
local-gateway address	28
log-prefix (L2TP)	29
maximum-send-window	29
ppp-access-profile	30
receive-window	30
retransmit-interval (Services)	31
service-interface	32
services (Hierarchy)	32
services (L2TP System Logging)	33
syslog	34
traceoptions (L2TP)	35
tunnel-group	39
tunnel-timeout	40

Part 3

Administration

Chapter 5

Layer 2 Tunneling Protocol Operational Mode Commands	43
clear services l2tp destination	44
clear services l2tp destination statistics	45
clear services l2tp multilink	46
clear services l2tp session	47
clear services l2tp session statistics	49
clear services l2tp tunnel	51
clear services l2tp tunnel statistics	53
show services l2tp multilink	55
show services l2tp radius	59
show services l2tp session	63
show services l2tp summary	70
show services l2tp tunnel	75
show services l2tp user	81

Part 4

Index

Index	87
-------------	----

List of Tables

	About the Documentation	vii
	Table 1: Notice Icons	ix
	Table 2: Text and Syntax Conventions	ix
Part 2	Configuration	
Chapter 2	Configuration Tasks	9
	Table 3: System Log Message Severity Levels	15
Part 3	Administration	
Chapter 5	Layer 2 Tunneling Protocol Operational Mode Commands	43
	Table 4: show services l2tp multilink Output Fields	55
	Table 5: show services l2tp radius Output Fields	59
	Table 6: show services l2tp session Output Fields	64
	Table 7: show services l2tp summary Output Fields	70
	Table 8: show services l2tp tunnel Output Fields	76
	Table 9: show services l2tp user Output Fields	81

About the Documentation

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

Documentation and Release Notes

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

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

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

Supported Platforms

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

- M Series

Using the Examples in This Manual

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

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

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

Merging a Full Example

To merge a full example, follow these steps:

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

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

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

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

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

Merging a Snippet

To merge a snippet, follow these steps:

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

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

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

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


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

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

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

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

Documentation Conventions

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

Table 1: Notice Icons

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

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

Table 2: Text and Syntax Conventions

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

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

Convention	Description	Examples
<i>Italic text like this</i>	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# set system domain-name <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none"> To configure a stub area, include the stub statement at the [edit protocols ospf area area-id] hierarchy level. The console port is labeled CONSOLE.
< > (angle brackets)	Enclose optional keywords or variables.	stub <default-metric metric>;
(pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	broadcast multicast (string1 string2 string3)
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	rsvp { # Required for dynamic MPLS only
[] (square brackets)	Enclose a variable for which you can substitute one or more values.	community name members [<i>community-ids</i>]
Indentation and braces ({ })	Identify a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; retain; } } }
;(semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	<ul style="list-style-type: none"> In the Logical Interfaces box, select All Interfaces. To cancel the configuration, click Cancel.
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select Protocols>Ospf .

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at

<https://www.juniper.net/cgi-bin/docbugreport/> . If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

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

Self-Help Online Tools and Resources

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

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>
- Join and participate in the Juniper Networks Community Forum: <http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

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

Opening a Case with JTAC

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

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

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

PART 1

Overview

- [Layer 2 Tunneling Protocol on page 3](#)

CHAPTER 1

Layer 2 Tunneling Protocol

- [Layer 2 Tunneling Protocol Overview on page 3](#)
- [L2TP Services Configuration Overview on page 4](#)
- [AS PIC Redundancy for L2TP Services on page 5](#)

Layer 2 Tunneling Protocol Overview

L2TP is defined in RFC 2661, *Layer Two Tunneling Protocol (L2TP)*.

L2TP facilitates the tunneling of PPP packets across an intervening network in a way that is as transparent as possible to both end users and applications. It employs access profiles for group and individual user access, and uses authentication to establish secure connections between the two ends of each tunnel. Multilink PPP functionality is also supported.

The L2TP services are supported on the following routers only:

- M7i routers with AS PICs
- M10i routers with AS and MultiServices 100 PICs
- M120 routers with AS, MultiServices 100, and MultiServices 400 PICs

For more information, see “[L2TP Services Configuration Overview](#)” on page 4.

Related Documentation

- [L2TP Services Configuration Overview on page 4](#)
- [AS PIC Redundancy for L2TP Services on page 5](#)
- [L2TP Minimum Configuration on page 9](#)
- [Examples: Configuring L2TP Services on page 21](#)

L2TP Services Configuration Overview

The statements for configuring L2TP services are found at the following hierarchy levels:

- **[edit services l2tp tunnel-group *group-name*]**

The L2TP **tunnel-group** statement identifies an L2TP instance or L2TP server. Associated statements specify the local gateway address on which incoming tunnels and sessions are accepted, the Adaptive Services (AS) Physical Interface Card (PIC) that processes data for the sessions in this tunnel group, references to L2TP and PPP access profiles, and other attributes for configuring window sizes and timer values.

- **[edit interfaces *sp-fpc/pic/port* unit *logical-unit-number* dial-options]**

The **dial-options** statement includes configuration for the **l2tp-interface-id** statement and the **shared/dedicated** flag. The interface identifier associates a user session with a logical interface. Sessions can use either shared or dedicated logical interfaces. To run routing protocols, a session must use a dedicated logical interface.

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

Tunnel profiles are defined at the **[edit access]** hierarchy level. Tunnel clients are defined with authentication, multilink negotiation and fragmentation, and other L2TP attributes in these profiles.

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

User profiles are defined at the **[edit access]** hierarchy level. User clients are defined with authentication and other PPP attributes in these profiles. These client profiles are used when local authentication is specified.

- **[edit access radius-server *address*]**

When you configure **authentication-order radius** at the **[edit access profile *profile-name*]** hierarchy level, you must configure a RADIUS service at the **[edit access radius-server]** hierarchy level.



NOTE: For more information about configuring properties at the **[edit access]** hierarchy level, see the *Junos OS Administration Library for Routing Devices*. For information about L2TP LAC and LNS configurations on MX Series routers for subscriber access, see *L2TP for Subscriber Access Overview* in the *Junos Subscriber Access Configuration Guide*.

Related Documentation

- [Layer 2 Tunneling Protocol Overview on page 3](#)
- [AS PIC Redundancy for L2TP Services on page 5](#)
- [L2TP Minimum Configuration on page 9](#)
- [Examples: Configuring L2TP Services on page 21](#)

AS PIC Redundancy for L2TP Services

L2TP services support AS PIC redundancy. To configure redundancy, you specify a redundancy services PIC (**rsp**) interface in which the primary AS PIC is active and a secondary AS PIC is on standby. If the primary AS PIC fails, the secondary PIC becomes active, and all service processing is transferred to it. If the primary AS PIC is restored, it remains in standby and does not preempt the secondary AS PIC; you need to manually restore the services to the primary PIC. To determine which PIC is currently active, issue the **show interfaces redundancy** command.



NOTE: On L2TP, the only service option supported is *warm standby*, in which one backup PIC supports multiple working PICs. Recovery times are not guaranteed, because the configuration must be completely restored on the backup PIC after a failure is detected. The tunnels and sessions are torn down upon switchover and need to be restarted by the LAC and PPP client, respectively. However, configuration is preserved and available on the new active PIC, although the protocol state needs to be reestablished.

As with the other AS PIC services that support warm standby, you can issue the **request interfaces (revert | switchover)** command to manually switch between primary and secondary L2TP interfaces.

For more information, see *Configuring AS or Multiservices PIC Redundancy*. For an example configuration, see “[Examples: Configuring L2TP Services](#)” on page 21. For information on operational mode commands, see the *Junos OS Operational Mode Commands*.

Related Documentation

- [Layer 2 Tunneling Protocol Overview on page 3](#)
- [L2TP Services Configuration Overview on page 4](#)
- [Configuring AS or Multiservices PIC Redundancy](#)
- [L2TP Minimum Configuration on page 9](#)
- [Examples: Configuring L2TP Services on page 21](#)

PART 2

Configuration

- [Configuration Tasks on page 9](#)
- [Example on page 21](#)
- [Configuration Statements on page 25](#)

CHAPTER 2

Configuration Tasks

- [L2TP Minimum Configuration on page 9](#)
- [Configuring L2TP Tunnel Groups on page 11](#)
- [Configuring the Identifier for Logical Interfaces that Provide L2TP Services on page 16](#)
- [Tracing L2TP Operations on page 18](#)

L2TP Minimum Configuration

To configure L2TP services, you must perform at least the following tasks:

- Define a tunnel group at the **[edit services l2tp]** hierarchy level with the following attributes:
 - **l2tp-access-profile**—Profile name for the L2TP tunnel.
 - **ppp-access-profile**—Profile name for the L2TP user.
 - **local-gateway**—Address for the L2TP tunnel.
 - **service-interface**—AS PIC interface for the L2TP service.
 - Optionally, you can configure **traceoptions** for debugging purposes.

The following example shows a minimum configuration for a tunnel group with trace options:

```
[edit services l2tp]
tunnel-group finance-lns-server {
  l2tp-access-profile westcoast_bldg_1_tunnel;
  ppp-access-profile westcoast_bldg_1;
  local-gateway {
    address 10.21.255.129;
  }
  service-interface sp-1/3/0;
}
traceoptions {
  flag all;
  filter {
    protocol udp;
    protocol l2tp;
    protocol ppp;
    protocol radius;
```

```
    }  
  }
```

- At the **[edit interfaces]** hierarchy level:
 - Identify the physical interface at which L2TP tunnel packets enter the router, for example **ge-0/3/0**.
 - Configure the AS PIC interface with **unit 0 family inet** defined for IP service, and configure another logical interface with **family inet** and the **dial-options** statement.

The following example shows a minimum interfaces configuration for L2TP:

```
[edit interfaces]  
ge-0/3/0 {  
  unit 0 {  
    family inet {  
      address 10.58.255.129/28;  
    }  
  }  
}  
sp-1/3/0 {  
  unit 0 {  
    family inet;  
  }  
  unit 20 {  
    dial-options {  
      l2tp-interface-id test;  
      shared;  
    }  
    family inet;  
  }  
}
```

- At the **[edit access]** hierarchy level:
 - Configure a tunnel profile. Each client specifies a unique L2TP Access Concentrator (LAC) name with an **interface-id** value that matches the one configured on the AS PIC interface unit; **shared-secret** is authentication between the LAC and the L2TP Network Server (LNS).
 - Configure a user profile. If RADIUS is used as the authentication method, it needs to be defined.
 - Define the RADIUS server with an IP address, port, and authentication data shared between the router and the RADIUS server.



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 that came into the IP-Address option of the IPCP Configuration Request packet.

- Optionally, you can define a group profile for common attributes, for example **keepalive 0** to turn off keepalive messages.

The following example shows a minimum profiles configuration for L2TP:

```
[edit access]
group-profile westcoast_users {
  ppp {
    keepalive 0;
  }
}
profile westcoast_bldg_1_tunnel {
  client production {
    l2tp {
      interface-id test;
      shared-secret "$9$n8HX6A01RhLvL1R"; # SECRET-DATA
    }
    user-group-profile westcoast_users;
  }
}
profile westcoast_bldg_1 {
  authentication-order radius;
}
radius-server {
  192.168.65.63 {
    port 1812;
    secret "$9$Vyb4ZHkPQ39mf9pORlexNdbgoZUjqP5"; # SECRET-DATA
  }
}
```

Related Documentation

- [L2TP Services Configuration Overview on page 4](#)
- [Configuring L2TP Tunnel Groups on page 11](#)
- [Configuring the Identifier for Logical Interfaces that Provide L2TP Services on page 16](#)
- [Tracing L2TP Operations on page 18](#)
- [Examples: Configuring L2TP Services on page 21](#)

Configuring L2TP Tunnel Groups

To establish L2TP service on a router, you need to identify an L2TP tunnel group and specify a number of values that define which access profiles, interface addresses, and other properties to use in creating a tunnel. To identify the tunnel group, include the **tunnel-group** statement at the **[edit services l2tp]** hierarchy level:

```
tunnel-group group-name {  
    hello-interval seconds;  
    hide-avps;  
    l2tp-access-profile profile-name;  
    local-gateway address address;  
    maximum-send-window packets;  
    ppp-access-profile profile-name;  
    receive-window packets;  
    retransmit-interval seconds;  
    service-interface interface-name;  
    syslog {  
        host hostname {  
            services severity-level;  
            facility-override facility-name;  
            log-prefix prefix-value;  
        }  
    }  
    tunnel-timeout seconds;  
}
```



NOTE: If you delete a tunnel group or mark it inactive, all L2TP sessions in that tunnel group are terminated. If you change the value of the `local-gateway` address or the `service-interface` statement, all L2TP sessions using those settings are terminated. If you change or delete other statements at the `[edit services l2tp tunnel-group group-name]` hierarchy level, new tunnels you establish will use the updated values but existing tunnels and sessions are not affected.

The following sections explain how to configure L2TP tunnel groups:

- [Configuring Access Profiles for L2TP Tunnel Groups on page 12](#)
- [Configuring the Local Gateway Address and PIC on page 13](#)
- [Configuring Window Size for L2TP Tunnels on page 13](#)
- [Configuring Timers for L2TP Tunnels on page 14](#)
- [Hiding Attribute-Value Pairs for L2TP Tunnels on page 14](#)
- [Configuring System Logging of L2TP Tunnel Activity on page 14](#)

Configuring Access Profiles for L2TP Tunnel Groups

To validate L2TP connections and session requests, you set up access profiles by configuring the `profile` statement at the `[edit access]` hierarchy level. You need to configure two types of profiles:

- L2TP tunnel access profile, which validates all L2TP connection requests to the specified local gateway address
- PPP access profile, which validates all PPP session requests through L2TP tunnels established to the local gateway address

For more information on configuring the profiles, see the *Junos OS Administration Library for Routing Devices*. A profile example is included in “[Examples: Configuring L2TP Services](#)” on page 21.

To associate the profiles with a tunnel group, include the **l2tp-access-profile** and **ppp-access-profile** statements at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
l2tp-access-profile profile-name;
ppp-access-profile profile-name;
```

Configuring the Local Gateway Address and PIC

When you configure an L2TP group, you must also define a local address for the L2TP tunnel connections and the AS PIC that processes the requests:

- To configure the local gateway IP address, include the **local-gateway** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
local-gateway address address;
```

- To configure the AS PIC, include the **service-interface** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
service-interface sp-fpc/pic/port;
```

You can optionally specify the logical unit number along with the service interface. If specified, the unit is used as a logical interface representing PPP sessions negotiated using this profile.



NOTE: If you change the local gateway address or the service interface configuration, all L2TP sessions using those settings are terminated.

Dynamic class-of-service (CoS) functionality is supported on L2TP LNS sessions or L2TP sessions with ATM VCs, as long as the L2TP session is configured to use an IQ2 PIC on the egress interface. For more information, see the *Junos OS Class of Service Library for Routing Devices*.

Configuring Window Size for L2TP Tunnels

You can configure the maximum window size for packet processing at each end of the L2TP tunnel:

- The receive window size limits the number of concurrent packets the server processes. By default, the maximum is 16 packets. To change the window size, include the **receive-window** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
receive-window packets;
```

- The maximum-send window size limits the other end's receive window size. The information is transmitted in the receive window size attribute-value pair. By default, the maximum is 32 packets. To change the window size, include the

maximum-send-window statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
maximum-send-window packets;
```

Configuring Timers for L2TP Tunnels

You can configure the following timer values that regulate L2TP tunnel processing:

- Hello interval—If the server does not receive any messages within a specified time interval, the router software sends a hello message to the tunnel's remote peer. By default, the interval length is 60 seconds. If you configure a value of 0, no hello messages are sent. To configure a different value, include the **hello-interval** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
hello-interval seconds;
```

- Retransmit interval—By default, the retransmit interval length is 30 seconds. To configure a different value, include the **retransmit-interval** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
retransmit-interval seconds;
```

- Tunnel timeout—If the server cannot send any data through the tunnel within a specified time interval, it assumes that the connection with the remote peer has been lost and deletes the tunnel. By default, the interval length is 120 seconds. To configure a different value, include the **tunnel-timeout** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
tunnel-timeout seconds;
```

Hiding Attribute-Value Pairs for L2TP Tunnels

Once an L2TP tunnel has been established and the connection authenticated, information is encoded by means of attribute-value pairs. By default, this information is not hidden. To hide the attribute-value pairs once the shared secret is known, include the **hide-avps** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
hide-avps;
```

Configuring System Logging of L2TP Tunnel Activity

You can specify properties that control how system log messages are generated for L2TP services.

To configure interface-wide default system logging values, include the **syslog** statement at the **[edit services l2tp tunnel-group group-name]** hierarchy level:

```
syslog {  
  host hostname {  
    services severity-level;  
    facility-override facility-name;  
    log-prefix prefix-value;  
  }  
}
```

Configure the **host** statement with a hostname or IP address that specifies the system log target server. The hostname **local** directs system log messages to the Routing Engine. For external system log servers, the hostname must be reachable from the same routing instance to which the initial data packet (that triggered session establishment) is delivered. You can specify only one system logging hostname.

Table 3 on page 15 lists the severity levels that you can specify in configuration statements at the **[edit services l2tp tunnel-group group-name syslog host hostname]** hierarchy level. The levels from **emergency** through **info** are in order from highest severity (greatest effect on functioning) to lowest.

Table 3: System Log Message Severity Levels

Severity Level	Description
any	Includes all severity levels
emergency	System panic or other condition that causes the router to stop functioning
alert	Conditions that require immediate correction, such as a corrupted system database
critical	Critical conditions, such as hard drive errors
error	Error conditions that generally have less serious consequences than errors in the emergency, alert, and critical levels
warning	Conditions that warrant monitoring
notice	Conditions that are not errors but might warrant special handling
info	Events or nonerror conditions of interest

We recommend setting the system logging severity level to **error** during normal operation. To monitor PIC resource usage, set the level to **warning**. To gather information about an intrusion attack when an intrusion detection system error is detected, set the level to **notice** for a specific service set. To debug a configuration or log Network Address Translation (NAT) events, set the level to **info**.

For more information about system log messages, see the *Junos OS System Log Messages Reference*.

To use one particular facility code for all logging to the specified system log host, include the **facility-override** statement at the **[edit services l2tp tunnel-group group-name syslog host hostname]** hierarchy level:

```
facility-override facility-name;
```

The supported facilities include: **authorization**, **daemon**, **ftp**, **kernel**, **user**, and **local0** through **local7**.

To specify a text prefix for all logging to this system log host, include the **log-prefix** statement at the **[edit services l2tp tunnel-group *group-name* syslog host *hostname*]** hierarchy level:

```
log-prefix prefix-text;
```

**Related
Documentation**

- [L2TP Services Configuration Overview on page 4](#)
- [L2TP Minimum Configuration on page 9](#)
- [Configuring the Identifier for Logical Interfaces that Provide L2TP Services on page 16](#)
- [Tracing L2TP Operations on page 18](#)
- [Examples: Configuring L2TP Services on page 21](#)

Configuring the Identifier for Logical Interfaces that Provide L2TP Services

You can configure L2TP services on adaptive services interfaces on M7i, M10i, and M120 routers only. You must configure the logical interface to be dedicated or shared. If a logical interface is dedicated, it can represent only one session at a time. A shared logical interface can have multiple sessions.

To configure the logical interface, include the **l2tp-interface-id** statement at the **[edit interfaces *interface-name* unit *logical-unit-number* dial-options]** hierarchy level:

```
l2tp-interface-id name;  
(dedicated | shared);
```

The **l2tp-interface-id** name configured on the logical interface must be replicated at the **[edit access profile *name*]** hierarchy level:

- For a user-specific identifier, include the **l2tp-interface-id** statement at the **[edit access profile *name* ppp]** hierarchy level.
- For a group identifier, include the **l2tp-interface-id** statement at the **[edit access profile *name* l2tp]** hierarchy level.

You can configure multiple logical interfaces with the same interface identifier, to be used as a pool for several users. For more information on configuring access profiles, see the *Junos OS Administration Library for Routing Devices*.



NOTE: If you delete the **dial-options** statement settings configured on a logical interface, all L2TP sessions running on that interface are terminated.

Example: Configuring Multilink PPP on a Shared Logical Interface

Multilink PPP is supported on either shared or dedicated logical interfaces. The following example can be used to configure many multilink bundles on a single shared interface:

```
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 test {
            l2tp {
                interface-id test;
                multilink;
                shared-secret "$9$n8HX6A01RhLvL1R"; # SECRET-DATA
            }
        }
    }
    profile u {
        authentication-order radius;
    }
    radius-server {
        192.168.65.63 {
            port 1812;
            secret "$9$Vyb4ZHkPQ39mf9pORlexNdbgoZUjqP5"; # SECRET-DATA
        }
    }
}
services {
    l2tp {
        tunnel-group 1 {
            l2tp-access-profile t;
            ppp-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;
            }
        }
    }
}
}

```

Related Documentation

- [L2TP Services Configuration Overview on page 4](#)
- [L2TP Minimum Configuration on page 9](#)
- [Configuring L2TP Tunnel Groups on page 11](#)
- [Tracing L2TP Operations on page 18](#)
- [Examples: Configuring L2TP Services on page 21](#)

Tracing L2TP Operations

Tracing operations track all AS PIC operations and record them in a log file in the `/var/log` directory. By default, this file is named `/var/log/l2tpd`.



NOTE: This topic refers to tracing L2TP LNS operations on M Series routers. To trace L2TP LAC operations on MX Series routers, see *Tracing L2TP Operations for Subscriber Access*.

To trace L2TP operations, include the **traceoptions** statement at the **[edit services l2tp]** hierarchy level:

```
traceoptions {  
  debug-level level;  
  file <filename> <files number> <match regular-expression> <size maximum-file-size>  
    <world-readable | no-world-readable>;  
  filter {  
    protocol name;  
    user-name username;  
  }  
  flag flag;  
  interfaces interface-name {  
    debug-level severity;  
    flag flag;  
  }  
  level (all | error | info | notice | verbose | warning);  
  no-remote-trace;  
}
```

You can specify the following L2TP tracing flags:

- **all**—Trace everything.
- **configuration**—Trace configuration events.
- **protocol**—Trace routing protocol events.
- **routing-socket**—Trace routing socket events.
- **rpd**—Trace routing protocol process events.

You can specify a trace level for PPP, L2TP, RADIUS, and User Datagram Protocol (UDP) tracing. To configure a trace level, include the **debug-level** statement at the **[edit services l2tp traceoptions]** hierarchy level and specify one of the following values:

- **detail**—Detailed debug information
- **error**—Errors only
- **packet-dump**—Packet decoding information

You can filter by protocol. To configure filters, include the **filter protocol** statement at the **[edit services l2tp traceoptions]** hierarchy level and specify one or more of the following protocol values:

- **ppp**
- **l2tp**
- **radius**
- **udp**

To implement filtering by protocol name, you must also configure either **flag protocol** or **flag all**.

You can also configure traceoptions for L2TP on a specific adaptive services interface. To configure per-interface tracing, include the **interfaces** statement at the **[edit services l2tp traceoptions]** hierarchy level:

```
interfaces interface-name {
    debug-level level;
    flag flag;
}
```



NOTE: Implementing traceoptions consumes CPU resources and affects the packet processing performance.

You can specify the **debug-level** and **flag** statements for the interface, but the options are slightly different from the general L2TP traceoptions. You specify the debug level as **detail**, **error**, or **extensive**, which provides complete PIC debug information. The following flags are available:

- **all**—Trace everything.
- **ipc**—Trace L2TP Inter-Process Communication (IPC) messages between the PIC and the Routing Engine.
- **packet-dump**—Dump each packet's content based on debug level.
- **protocol**—Trace L2TP, PPP, and multilink handling.
- **system**—Trace packet processing on the PIC.

**Related
Documentation**

- [L2TP Services Configuration Overview on page 4](#)
- [L2TP Minimum Configuration on page 9](#)
- [Configuring L2TP Tunnel Groups on page 11](#)
- [Configuring the Identifier for Logical Interfaces that Provide L2TP Services on page 16](#)
- [Examples: Configuring L2TP Services on page 21](#)

CHAPTER 3

Example

- [Examples: Configuring L2TP Services on page 21](#)

Examples: Configuring L2TP Services

Configure L2TP with multiple group and user profiles and a pool of logical interfaces for concurrent tunnel sessions:

```
[edit access]
address-pool customer_a {
  address 10.1.1.1/32;
}
address-pool customer_b {
  address-range low 10.2.2.1 high 10.2.3.2;
}
group-profile sunnyvale_users {
  ppp {
    framed-pool customer_a;
    idle-timeout 15;
    primary-dns 192.168.65.1;
    secondary-dns 192.168.65.2;
    primary-wins 192.168.65.3;
    secondary-wins 192.168.65.4;
    interface-id west;
  }
}
group-profile eastcoast_users {
  ppp {
    framed-pool customer_b;
    idle-timeout 20;
    primary-dns 192.168.65.5;
    secondary-dns 192.168.65.6;
    primary-wins 192.168.65.7;
    secondary-wins 192.168.65.8;
    interface-id east;
  }
}
group-profile sunnyvale_tunnel {
  l2tp {
    maximum-sessions-per-tunnel 100;
    interface-id west_shared;
  }
}
```

```
}
group-profile east_tunnel {
  l2tp {
    maximum-sessions-per-tunnel 125;
    interface-id east_shared;
  }
}
profile sunnyvale_bldg_1 {
  client white {
    chap-secret "$9$3s2690leK8X7VKM7VwgaJn/Ctu1hclv87Ct87"; # SECRET-DATA
    ppp {
      idle-timeout 22;
      primary-dns 192.168.65.1;
      framed-ip-address 10.12.12.12/32;
      interface-id east;
    }
    group-profile sunnyvale_users;
  }
  client blue {
    chap-secret "$9$eq1KWxbwgZUHNdjmqmTF3uO1Rhr-dsoJDNd"; # SECRET-DATA
    group-profile sunnyvale_users;
  }
  authentication-order password;
}
profile sunnyvale_bldg_1_tunnel {
  client test {
    l2tp {
      shared-secret "$9$r3HKvLg4ZUDkX7JGjif5p0BIRS8LN"; # SECRET-DATA
      maximum-sessions-per-tunnel 75;
      interface-id west_shared;
      ppp-authentication chap;
    }
    group-profile sunnyvale_tunnel;
  }
  client production {
    l2tp {
      shared-secret
        "$9$R2QErV8X-goGylVwg4jiTz36/t0BEleWFnRhrlXxbs2aJDHqf3nCP5";
      ppp-authentication chap;
    }
    group-profile sunnyvale_tunnel;
  }
}
[edit services]
l2tp {
  tunnel-group finance-lns-server {
    l2tp-access-profile sunnyvale_bldg_1_tunnel;
    ppp-access-profile sunnyvale_bldg_1;
    local-gateway {
      address 10.1.117.3;
    }
    service-interface sp-1/3/0;
    receive-window 1500;
    maximum-send-window 1200;
    retransmit-interval 5;
    hello-interval 15;
```

```

        tunnel-timeout 55;
    }
    traceoptions {
        flag all;
    }
}
[edit interfaces sp-1/3/0]
unit0 {
    family inet;
}
unit 10 {
    dial-options {
        l2tp-interface-id foo-user;
        dedicated;
    }
    family inet;
}
unit 11 {
    dial-options {
        l2tp-interface-id east;
        dedicated;
    }
    family inet;
}
unit 12 {
    dial-options {
        l2tp-interface-id east;
        dedicated;
    }
    family inet;
}
unit 21 {
    dial-options {
        l2tp-interface-id west;
        dedicated;
    }
    family inet;
}
unit 30 {
    dial-options {
        l2tp-interface-id west_shared;
        shared;
    }
    family inet;
}
unit 40 {
    dial-options {
        l2tp-interface-id east_shared;
        shared;
    }
    family inet;
}

```

Configure L2TP redundancy:

```

interfaces {

```

```
rsp0 {  
  redundancy-options {  
    primary sp-0/0/0;  
    secondary sp-1/3/0;  
  }  
  unit 0 {  
    family inet;  
  }  
  unit 11 {  
    dial-options {  
      l2tp-interface-id east_shared;  
      shared;  
    }  
    family inet;  
  }  
}
```

**Related
Documentation**

- [L2TP Services Configuration Overview on page 4](#)
- [L2TP Minimum Configuration on page 9](#)
- [Configuring L2TP Tunnel Groups on page 11](#)
- [Configuring the Identifier for Logical Interfaces that Provide L2TP Services on page 16](#)
- [Tracing L2TP Operations on page 18](#)


CHAPTER 4

Configuration Statements


facility-override

Syntax	<code>facility-override <i>facility-name</i>;</code>
Hierarchy Level	[edit services l2tp tunnel-group <i>group-name</i> syslog host <i>hostname</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Override the default facility for system log reporting.
Options	<p><i>facility-name</i>—Name of the facility that overrides the default assignment. Valid entries include:</p> <ul style="list-style-type: none">authorizationdaemonftpkernellocal0 through local7user
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring System Logging of L2TP Tunnel Activity on page 14

hello-interval

Syntax	hello-interval <i>seconds</i> ;
Hierarchy Level	[edit services l2tp tunnel-group name]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the keepalive timer for L2TP tunnels.
	<div> NOTE: Subordinate statement support depends on the platform. See individual statement topics for more detailed support information.</div>
Options	<i>seconds</i> —Interval, in seconds, after which the server sends a hello message if no messages are received. A value of 0 means that no hello messages are sent. Default: 60 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Timers for L2TP Tunnels on page 14• Configuring an L2TP Tunnel Group for LNS Sessions with Inline Services Interfaces

hide-avps

Syntax	hide-avps;
Hierarchy Level	[edit services l2tp tunnel-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Hide L2TP attribute-value pairs if the secret shared between the two ends of the tunnel is known.
	 <p>NOTE: This statement is not supported for L2TP LNS on MX Series routers.</p>
Default	Attribute-value pairs that can be hidden are exposed, even if the secret information is known.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Hiding Attribute-Value Pairs for L2TP Tunnels on page 14

host (L2TP)

Syntax	<pre>host <i>hostname</i> { services <i>severity-level</i>; facility-override <i>facility-name</i>; log-prefix <i>prefix-value</i>; }</pre>
Hierarchy Level	[edit services l2tp tunnel-group <i>group-name</i> syslog]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the hostname for the system logging utility.
Options	<p>hostname—Name of the system logging utility host machine. This can be the local Routing Engine or an external server address.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring System Logging of L2TP Tunnel Activity on page 14

l2tp-access-profile

Syntax	l2tp-access-profile <i>profile-name</i> ;
Hierarchy Level	[edit services l2tp tunnel-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the profile used to validate all L2TP connection requests to the local gateway address.
Options	<i>profile-name</i> —Identifier for the L2TP connection profile.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Access Profiles for L2TP Tunnel Groups on page 12• Configuring an L2TP Access Profile on the LNS

local-gateway address

Syntax	local-gateway address <i>address</i> ;
Hierarchy Level	[edit services l2tp tunnel-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the local (LNS) IP address for L2TP tunnel.
Options	<i>address</i> —Local IP address; corresponds to the IP address that is used by LACs to identify the LNS. When the LAC is an MX Series router, this address matches the remote gateway address configured in the LAC tunnel profile.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Local Gateway Address and PIC on page 13.• Configuring L2TP Tunnel Groups on page 11• Configuring an L2TP Tunnel Group for LNS Sessions with Inline Services Interfaces

log-prefix (L2TP)

Syntax	<code>log-prefix <i>prefix-value</i>;</code>
Hierarchy Level	[edit services l2tp tunnel-group <i>group-name</i> syslog host <i>hostname</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Set the system logging prefix value.
Options	<i>prefix-value</i> —System logging prefix value.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring System Logging of L2TP Tunnel Activity on page 14

maximum-send-window


Syntax	<code>maximum-send-window <i>packets</i>;</code>
Hierarchy Level	[edit services l2tp tunnel-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the size of the send window for L2TP tunnels, which limits the remote end's receive window size.




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

Options	<i>packets</i> —Maximum number of packets the send window can hold at one time. Default: 32
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • Configuring Window Size for L2TP Tunnels on page 13


ppp-access-profile

Syntax	<code>ppp-access-profile <i>profile-name</i>;</code>
Hierarchy Level	<code>[edit services l2tp tunnel-group name]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the profile used to validate all Point-to-Point Protocol (PPP) session requests through L2TP tunnels established to the local gateway address.
	<div> NOTE: This statement is not supported for L2TP LNS on MX Series routers.</div>
Options	<i>profile-name</i> —Identifier for the PPP profile.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Access Profiles for L2TP Tunnel Groups on page 12


receive-window

Syntax	<code>receive-window <i>packets</i>;</code>
Hierarchy Level	<code>[edit services l2tp tunnel-group name]</code>
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the size of the receive window for L2TP tunnels, which limits the number of packets the server processes concurrently.
	<div> NOTE: This statement is not supported for L2TP LNS on MX Series routers.</div>
Options	<i>packets</i> —Maximum number of packets the receive window can hold at one time. Default: 16
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Window Size for L2TP Tunnels on page 13

retransmit-interval (Services)

Syntax	<code>retransmit-interval <i>seconds</i>;</code>
Hierarchy Level	[edit services l2tp tunnel-group name]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the maximum retransmit interval for L2TP tunnels.
<div>  <p>NOTE: This statement is not supported for L2TP LNS on MX Series routers.</p> </div>	
Options	<p><i>seconds</i>—Interval, in seconds, after which the server retransmits data if no acknowledgment is received.</p> <p>Default: 30 seconds</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring Timers for L2TP Tunnels on page 14

service-interface

Syntax	service-interface <i>interface-name</i> ;
Hierarchy Level	[edit services l2tp tunnel-group <i>name</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Option si-fpc/pic/port introduced in Junos OS Release 11.4.
Description	Specify the service interface responsible for handling L2TP processing.
	<div><p>NOTE: On MX Series routers, the service interface configuration is required for static LNS sessions. Either the service interface configuration or the service device pool configuration can be used for dynamic LNS sessions.</p></div>
Options	interface-name —Name of the service interface. The interface type depends on the line card as follows: <ul style="list-style-type: none">• sp-fpc/pic/port—On AS or Multiservices PICs on M7i, M10i, and M120 routers.• si-fpc/pic/port—On MPCs on MX Series routers.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Local Gateway Address and PIC on page 13• Configuring an L2TP Tunnel Group for LNS Sessions with Inline Services Interfaces

services (Hierarchy)

Syntax	services l2tp { ... }
Hierarchy Level	[edit]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Define the service properties to be applied to traffic.
Options	l2tp —Identifies the L2TP set of services statements.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• L2TP Services Configuration Overview on page 4

services (L2TP System Logging)

Syntax	<code>services severity-level;</code>
Hierarchy Level	[edit services l2tp tunnel-group <i>group-name</i> syslog host <i>hostname</i>]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the system logging severity level.
Options	<p>severity-level—Assigns a severity level to the facility. Valid entries include:</p> <ul style="list-style-type: none"> • alert—Conditions that should be corrected immediately. • any—Matches any level. • critical—Critical conditions. • emergency—Panic conditions. • error—Error conditions. • info—Informational messages. • notice—Conditions that require special handling. • warning—Warning messages.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring System Logging of L2TP Tunnel Activity on page 14

syslog

Syntax `syslog {
 host hostname {
 services severity-level;
 facility-override facility-name;
 log-prefix prefix-value;
 }
 }`

Hierarchy Level `[edit services l2tp tunnel-group group-name]`

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure the generation of system log messages for L2TP services. System log information is passed to the kernel for logging in the `/var/log/l2tpd` directory.



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

Options The remaining statements are described separately.

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

Related Documentation • [Configuring System Logging of L2TP Tunnel Activity on page 14](#)

traceoptions (L2TP)

Syntax	<pre> traceoptions { debug-level <i>level</i>; file <i>filename</i> <files <i>number</i>> <match <i>regular-expression</i> > <size <i>maximum-file-size</i>> <world-readable no-world-readable>; filter { protocol <i>name</i>; user-name <i>username</i>; } flag <i>flag</i>; interfaces <i>interface-name</i> { debug-level <i>level</i>; flag <i>flag</i>; } level (all error info notice verbose warning); no-remote-trace; } </pre>
Hierarchy Level	[edit services l2tp]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Define tracing operations for L2TP processes.
Options	<p>debug-level <i>level</i>—Trace level for PPP, L2TP, RADIUS, and UDP; this option does not apply to L2TP on MX Series routers:</p> <ul style="list-style-type: none"> • detail—Trace detailed debug information. • error—Trace error information. • packet-dump—Trace packet decoding information. <p>file <i>filename</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory /var/log.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files to create before overwriting the oldest one. If you specify a maximum number of files, you also must specify a maximum file size with the size option.</p> <p>Range: 2 through 1000</p> <p>Default: 3 files</p> <p>filter protocol <i>name</i>—Additional filter for the specified protocol; this option does not apply to L2TP on MX Series routers:</p> <ul style="list-style-type: none"> • l2tp • ppp • radius • udp

filter user-name *username*—Additional filter for the specified username; this option does not apply to L2TP on MX Series routers.

flag *flag*—Tracing operation to perform. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags:

- **all**—Trace all operations.
- **configuration**—Trace configuration events.
- **events**—Trace interface events.
- **general**—Trace general events.
- **gres**—Trace GRES events.
- **init**—Trace daemon initialization.
- **ipc-rx**—Trace IPC receive events.
- **ipc-tx**—Trace IPC transmit events.
- **memory**—Trace memory management code.
- **message**—Trace message processing code.
- **packet-error**—Trace packet error events.
- **parse**—Trace parsing events.
- **protocol**—Trace L2TP events.
- **receive-packets**—Trace received L2TP packets.
- **routing-process**—Trace routing process interactions.
- **routing-socket**—Trace routing socket events.
- **session-db**—Trace session database interactions.
- **states**—Trace state machine events.
- **timer**—Trace timer events.
- **transmit-packets**—Trace transmitted L2TP packets.
- **tunnel**—Trace tunnel events.

interfaces *interface-name*—Apply L2TP traceoptions to a specific services interface. This option does not apply to L2TP on MX Series routers.

- **debug-level *level***—Trace level for the interface; this option does not apply to L2TP on MX Series routers:
 - **detail**—Trace detailed debug information.
 - **error**—Trace error information.
 - **extensive**—Trace all PIC debug information.
- **flag *flag***—Tracing operation to perform for the interface. This option does not apply to L2TP on MX Series routers. To specify more than one tracing operation, include multiple **flag** statements. You can include the following flags:
 - **all**—Trace everything.
 - **ipc**—Trace L2TP Inter-Process Communication (IPC) messages between the PIC and the Routing Engine.
 - **packet-dump**—Dump each packet content based on debug level.
 - **protocol**—Trace L2TP, PPP, and multilink handling.
 - **system**—Trace packet processing on the PIC.

level—Specify level of tracing to perform. The option you configure enables tracing of events at that level and all higher (more restrictive) levels. You can specify any of the following levels:

- **all**—Match messages of all levels.
- **error**—Match error messages.
- **info**—Match informational messages.
- **notice**—Match notice messages about conditions requiring special handling.
- **verbose**—Match verbose messages. This is the lowest (least restrictive) severity level; when you configure **verbose**, messages at all higher levels are traced. Therefore, the result is the same as when you configure **all**.
- **warning**—Match warning messages.

match *regular-expression*—(Optional) Refine the output to include lines that contain the regular expression.

no-remote-trace—Disable remote tracing.

no-world-readable—(Optional) Disable unrestricted file access.

size *maximum-file-size*—(Optional) Maximum size of each trace file. By default, the number entered is treated as bytes. Alternatively, you can include a suffix to the number to indicate kilobytes (KB), megabytes (MB), or gigabytes (GB). If you specify a maximum file size, you also must specify a maximum number of trace files with the **files** option.

Syntax: *sizek* to specify KB, *sizem* to specify MB, or *sizeg* to specify GB

Range: 10240 through 1073741824

world-readable—(Optional) Enable unrestricted file access.

Required Privilege Level	trace—To view this statement in the configuration.
	trace-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Tracing L2TP Operations on page 18• <i>Tracing L2TP Operations for Subscriber Access</i>

tunnel-group

Syntax `tunnel-group group-name {
aaa-access-profile profile-name;
dynamic-profile profile-name;
hello-interval seconds;
hide-avps;
l2tp-access-profile profile-name;
local-gateway address address;
maximum-send-window packets;
ppp-access-profile profile-name;
receive-window packets;
retransmit-interval seconds;
service-device-pool pool-name;
service-interface interface-name;
syslog {
 host hostname {
 services severity-level;
 facility-override facility-name;
 log-prefix prefix-value;
 }
}
tos-reflect;
tunnel-switch-profile profile-name;
tunnel-timeout seconds;
}`

Hierarchy Level [edit services l2tp]

Release Information Statement introduced before Junos OS Release 7.4.
Support for MX Series routers introduced in Junos OS Release 11.4.

Description Specify the L2TP tunnel properties.



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

Options *group-name*—Identifier for the tunnel group.

The remaining statements are explained separately.

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

Related Documentation

- [Configuring L2TP Tunnel Groups on page 11](#)
- [Configuring an L2TP Tunnel Group for LNS Sessions with Inline Services Interfaces](#)

tunnel-timeout

Syntax	tunnel-timeout <i>seconds</i> ;
Hierarchy Level	[edit services l2tp tunnel-group name]
Release Information	Statement introduced before Junos OS Release 7.4.
Description	Specify the maximum downtime for an L2TP tunnel, after which the tunnel is terminated because the connection is presumed to have been lost.
Options	<i>seconds</i> —Interval after which the tunnel is terminated if no data can be sent. Default: 120 seconds
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring Timers for L2TP Tunnels on page 14• <i>Configuring an L2TP Tunnel Group for LNS Sessions with Inline Services Interfaces</i>

PART 3

Administration

- [Layer 2 Tunneling Protocol Operational Mode Commands on page 43](#)

CHAPTER 5

Layer 2 Tunneling Protocol Operational Mode Commands

clear services l2tp destination

Syntax	<code>clear services l2tp destination</code> <code><all local-gateway <i>gateway-address</i> peer-gateway <i>gateway-address</i>></code>
Release Information	Command introduced in Junos OS Release 10.4. Statistics option introduced in Junos OS Release 13.1
Description	Clear all Layer 2 Tunneling Protocol (L2TP) destinations and all tunnels and sessions that belong to the destinations. This command is available only for LAC on MX Series routers.
Options	all —Close all L2TP destinations. local-gateway <i>gateway-address</i> —Clear only the L2TP destinations and all tunnels and sessions associated with the specified local gateway address. peer-gateway <i>gateway-address</i> —Clear only the L2TP destinations and all tunnels and sessions associated with the peer gateway with the specified address.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show services l2tp destination
List of Sample Output	clear services l2tp destination all on page 44
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear services l2tp destination all

```
user@host> clear services l2tp destination all

Destination 2 closed
```


clear services l2tp destination statistics

Syntax	clear services l2tp destination statistics <all local-gateway <i>gateway-address</i> peer-gateway <i>gateway-address</i> >
Release Information	Command introduced in Junos OS Release 13.1.
Description	Clear all statistics associated with the Layer 2 Tunneling Protocol (L2TP) destinations and all tunnels and sessions that belong to the destinations. This command is available only for LAC on MX Series routers.
Options	<p>all—Clear all statistics associated with the L2TP destinations.</p> <p>local-gateway <i>gateway-address</i>—Clear statistics related to L2TP destination and all tunnels and sessions associated with the specified local gateway address.</p> <p>peer-gateway <i>gateway-address</i>—Clear statistics related to L2TP destination and all tunnels and sessions associated with the specified peer gateway address.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• <i>show services l2tp destination</i>
List of Sample Output	clear services l2tp destination statistics on page 45
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear services l2tp destination statistics

```
user@host>clear services l2tp destination statistics all
Destination 1 statistics cleared
```

clear services l2tp multilink

Syntax	clear services l2tp multilink (all <statistics> bundle-id <i>number</i> <statistics> statistics (all bundle-id <i>number</i>))
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M10i and M7i routers only) Close Layer 2 Tunneling Protocol (L2TP) multilink sessions or clear session statistics.
Options	<p>all <statistics>—Close all L2TP multilink sessions or clear statistics for all L2TP multilink sessions.</p> <p>bundle-id <i>number</i> <statistics>—L2TP multilink bundle ID. The value is an internally generated number from 1 to 65535. Close the specified L2TP multilink session, or using the statistics keyword with this option, clear statistics for the specified session.</p> <p>statistics (all bundle-id <i>number</i>)—Clear all session statistics or clear statistics for the specified multilink bundle ID.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none">• L2TP Services Configuration Overview on page 4• L2TP Minimum Configuration on page 9• show services l2tp multilink on page 55
List of Sample Output	clear services l2tp multilink statistics all on page 46
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear services l2tp multilink statistics all

```
user@host> clear services l2tp multilink statistics all
Multilink 1 statistics cleared
```

clear services l2tp session

Syntax	clear services l2tp session (all interface <i>interface-name</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-session-id <i>session-id</i> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> tunnel-group <i>group-name</i> user <i>username</i>)
Release Information	Command introduced before Junos OS Release 7.4.
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.
Options	<p>all—Close all L2TP sessions.</p> <p>interface <i>interface-name</i>—Clear only the L2TP sessions using 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"> • si-<i>fpc/pic/port</i>—MPCs on MX Series routers only. This option is not available for L2TP on M Series routers. • sp-<i>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. <p>local-gateway <i>gateway-address</i>—Clear only the L2TP sessions associated with the specified local gateway address.</p> <p>local-gateway-name <i>gateway-name</i>—Clear only the L2TP sessions associated with the specified local gateway name.</p> <p>local-session-id <i>session-id</i>—Clear only the L2TP sessions with this identifier for the local endpoint of the L2TP session.</p> <p>local-tunnel-id <i>tunnel-id</i>—Clear only the L2TP sessions associated with the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—Clear only the L2TP sessions associated with the peer gateway with the specified address.</p> <p>peer-gateway-name <i>gateway-name</i>—Clear only the L2TP sessions associated with the peer gateway with the specified name.</p> <p>tunnel-group <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.</p> <p>user <i>username</i>—(M Series routers only) Clear only the L2TP sessions for the specified username.</p>
Required Privilege Level	clear

- Related Documentation**
- [L2TP Services Configuration Overview on page 4](#)
 - [L2TP Minimum Configuration on page 9](#)
 - [clear services l2tp session statistics on page 49](#)
 - [show services l2tp session on page 63](#)

List of Sample Output [clear services l2tp session on page 48](#)
[clear services l2tp session interface on page 48](#)

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 ID	Remote ID	State	Interface unit	Interface Name
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

```
user@host> clear services l2tp session interface si-2/0/0
```

```
Session 5117 closed
```

```
Session 6454 closed
```

```
user@host> show services l2tp session Tunnel local ID: 17185
```

Local ID	Remote ID	State	Interface unit	Interface Name
34915	2	Established	1073741829	si-2/1/0
46142	4	Established	1073741831	si-2/1/0

clear services l2tp session statistics

Syntax	clear services l2tp session statistics (all interface <i>interface-name</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-session-id <i>session-id</i> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> tunnel-group <i>group-name</i> user <i>username</i>)
Release Information	Command introduced before Junos OS Release 7.4. Support for MX Series routers added in Junos OS Release 10.4.
Description	(M10i and M7i routers: LNS only. MX Series routers: LAC and LNS.) Clear statistics for Layer 2 Tunneling Protocol (L2TP) sessions.
Options	<p>all—Clear statistics for all L2TP sessions.</p> <p>interface <i>interface-name</i>—Clear only the L2TP sessions using 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"> si-<i>fpc/pic/port</i>—MPCs on MX Series routers only. This option is not available for L2TP on M Series routers. sp-<i>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. <p>local-gateway <i>gateway-address</i>—Clear statistics for only the L2TP sessions associated with the local gateway with the specified address.</p> <p>local-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP sessions associated with the local gateway with the specified name.</p> <p>local-session-id <i>session-id</i>—Clear statistics for only the L2TP sessions with this identifier for the local endpoint of the L2TP session.</p> <p>local-tunnel-id <i>tunnel-id</i>—Clear statistics for only the L2TP sessions associated with the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—Clear statistics for only the L2TP sessions associated with the peer gateway with the specified address.</p> <p>peer-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP sessions associated with the peer gateway with the specified name.</p> <p>tunnel-group <i>group-name</i>—Clear statistics for only the L2TP sessions associated with the specified tunnel group. This option is not available for L2TP LAC on MX Series routers.</p> <p>user <i>username</i> <statistics>—Clear statistics for only the L2TP sessions for the specified username. This option is not available for L2TP LAC on MX Series routers.</p>
Required Privilege Level	view

- Related Documentation**
- [L2TP Services Configuration Overview on page 4](#)
 - [L2TP Minimum Configuration on page 9](#)
 - [clear services l2tp session on page 47](#)
 - [show services l2tp session on page 63](#)

List of Sample Output [clear services l2tp session statistics all on page 50](#)

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

Sample Output

[clear services l2tp session statistics all](#)

```
user@host> clear services l2tp session statistics all
Session 26497 statistics cleared
```

clear services l2tp tunnel

Syntax	clear services l2tp tunnel (all interface <i>sp-fpc/pic/port</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> tunnel-group <i>group-name</i>)
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.
Description	(M10i and M7i routers: LNS only. MX Series routers: LAC and LNS.) Clear Layer 2 Tunneling Protocol (L2TP) tunnels.
Options	<p>all—Clear all L2TP tunnels.</p> <p>sp-fpc/pic/port—(Optional) Clear only the L2TP tunnels using the specified adaptive services interface. This option is not available for L2TP on MX Series routers.</p> <p>local-gateway gateway-address—Clear only the L2TP tunnels associated with the local gateway with the specified address.</p> <p>local-gateway-name gateway-name—Clear only the L2TP tunnels associated with the local gateway with the specified name.</p> <p>local-tunnel-id tunnel-id—Clear only the L2TP tunnels that have the specified local tunnel identifier.</p> <p>peer-gateway gateway-address—Clear only the L2TP tunnels associated with the peer gateway with the specified address.</p> <p>peer-gateway-name gateway-name—Clear only the L2TP tunnels associated with the peer gateway with the specified name.</p> <p>tunnel-group group-name—Clear only the L2TP tunnels in the specified tunnel group. This option is not available for L2TP LAC on MX Series routers.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • L2TP Services Configuration Overview on page 4 • L2TP Minimum Configuration on page 9 • clear services l2tp tunnel statistics on page 53 • show services l2tp tunnel on page 75
List of Sample Output	clear services l2tp tunnel on page 52
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear services l2tp tunnel

```
user@host> clear services l2tp tunnel 17185
```

```
Tunnel 17185 closed
```


clear services l2tp tunnel statistics

Syntax	clear services l2tp tunnel statistics (all interface <i>sp-fpc/pic/port</i> local-gateway <i>gateway-address</i> local-gateway-name <i>gateway-name</i> local-tunnel-id <i>tunnel-id</i> peer-gateway <i>gateway-address</i> peer-gateway-name <i>gateway-name</i> tunnel-group <i>group-name</i>)
Release Information	Command introduced before Junos OS Release 7.4. Support for MX Series routers added in Junos OS Release 10.4.
Description	(M10i and M7i routers: LNS only. MX Series routers: LAC only.) Clear statistics for Layer 2 Tunneling Protocol (L2TP) tunnels.
Options	<p>all—Clear statistics for all L2TP tunnels.</p> <p>interface <i>sp-fpc/pic/port</i>—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.</p> <p>local-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels associated with the local gateway with the specified address.</p> <p>local-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels associated with the local gateway with the specified name.</p> <p>local-tunnel-id <i>tunnel-id</i>—Clear statistics for only the L2TP tunnels that have the specified local tunnel identifier.</p> <p>peer-gateway <i>gateway-address</i>—Clear statistics for only the L2TP tunnels associated with the peer gateway with the specified address.</p> <p>peer-gateway-name <i>gateway-name</i>—Clear statistics for only the L2TP tunnels associated with the peer gateway with the specified name.</p> <p>tunnel-group <i>group-name</i>—Clear statistics for only the L2TP tunnels in the specified tunnel group. This option is not available for L2TP LAC on MX Series routers.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none"> • L2TP Services Configuration Overview on page 4 • L2TP Minimum Configuration on page 9 • clear services l2tp tunnel on page 51 • show services l2tp tunnel on page 75
List of Sample Output	clear services l2tp tunnel statistics all on page 54
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
```

show services l2tp multilink

Syntax	show services l2tp multilink <brief detail extensive statistics> <bundle-id <i>number</i> >
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M10i and M7i routers only) Display L2TP output organized by multilink bundle.
Options	<p>none—Same as brief.</p> <p>brief detail extensive statistics—(Optional) Display the specified level of output. Use the statistics option to display packets and bytes that have been encapsulated in the Multilink Protocol. Nonmultilink packets received on member sessions are not counted here.</p> <p>bundle-id <i>number</i>—(Optional) Display L2TP multilink bundle information for only the specified bundle.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • L2TP Services Configuration Overview on page 4 • L2TP Minimum Configuration on page 9 • clear services l2tp multilink on page 46
List of Sample Output	show services l2tp multilink extensive on page 58
Output Fields	Table 4 on page 55 lists the output fields for the show services l2tp multilink command. Output fields are listed in the approximate order in which they appear.

Table 4: show services l2tp multilink Output Fields

Field Name	Field Description	Level of Output
Bundle ID	Bundle identifier.	All levels
Links	Number of links in the multilink bundle.	All levels
Bundle endpoint	Endpoint discriminator that represents the device transmitting the packet.	All levels
Input MRRU	Maximum packet size that the input interface can process.	detail
Output MRRU	Maximum packet size that the output interface can process.	detail

Table 4: show services l2tp multilink Output Fields (*continued*)

Field Name	Field Description	Level of Output
Session local ID	Identifier of the local endpoint of the L2TP session, as assigned by the L2TP network server (LNS).	detail
Session remote ID	Identifier of the remote endpoint of the L2TP session, as assigned by the L2TP access concentrator (LAC).	detail
State	Status of the L2TP session: <ul style="list-style-type: none"> • Established—The session is operating. • closed—The session is being closed. • destroyed—The session is being destroyed. • clean-up—The session is being cleaned up. • lns-ic-accept-new—A new session is being accepted. • lns-ic-idle—The session has been created and is idle. • lns-ic-reject-new—The new session is being rejected. • lns-ic-wait-connect—The session is waiting for the peer's incoming call connected (ICCN) message. 	detail
Username	Name of the user logged in to the session.	detail
Mode	Mode of the interface representing the multilink bundle: dedicated or shared .	extensive
Local IP	IP address of the local endpoint of the Point-to-Point Protocol (PPP) session.	extensive
Remote IP	IP address of the remote endpoint of the PPP session.	extensive
Local name	Name of the LNS instance in which the session was created.	extensive
Remote name	Name of the LAC from which the session was created.	extensive
Local MRU	Maximum receive unit (MRU) setting of the local device, in bytes.	extensive

Table 4: show services l2tp multilink Output Fields (*continued*)

Field Name	Field Description	Level of Output
Remote MRU	MRU setting of the remote device, in bytes.	extensive
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> • Control Tx—Amount of control information transmitted, in packets and bytes. • Control Rx—Amount of control information received, in packets and bytes. • Data Tx—Amount of data transmitted, in packets and bytes. • Data Rx—Amount of data received, in packets and bytes. • Errors Tx—Number of errors transmitted, in packets. • Errors Rx—Number of errors received, in packets. • Lcp Echo Req Tx—Number of LCP echo requests transmitted, in packets. • Lcp Echo Req Rx—Number of LCP echo requests received, in packets. • Lcp Echo Rep Tx—Number of LCP echo responses transmitted, in packets. • Lcp Echo Rep Rx—Number of LCP echo responses received, in packets. • Lcp Echo Req Timeout—Number of LCP echo requests that timed out. • Lcp Echo Req Error—Number of errors received for LCP echo packets. • Lcp Echo Rep Error—Number of errors transmitted for LCP echo packets. • MRRU—Maximum packet size processed. • TX—Number of packets transmitted. • RX—Number of packets received. • link—Link of the multilink bundle associated with the L2TP session. 	extensive

Sample Output

show services l2tp multilink extensive

```
user@host> show services l2tp multilink extensive
Bundle ID: 1
  Links: 2, Bundle endpoint: user@juniper.com
  Input MRRU: 1524, Output MRRU: 1524
  Session local ID: 46122, Session remote ID: 39307
    State: Established, Username: user1@juniper.com, Mode: dedicated
    Local IP: 10.58.255.129:1701, Remote IP: 10.58.255.131:1701
    Local name: router3, Remote name: router4
  Session local ID: 4254, Session remote ID: 39308
    State: Established, Username: user2@juniper.com, Mode: dedicated
    Local IP: 10.1.255.1:1701, Remote IP: 10.1.255.2:1701
    Local name: router1, Remote name: router2
  Statistics since: Mon May 17 11:47:35 2004
    Packets      Bytes
    Control Tx   7      196
    Control Rx   3      90
    Data Tx      0       0
    Data Rx      0       0
    Errors Tx    0
    Errors Rx    0
    Lcp Echo Req Tx 0
    Lcp Echo Req Rx 0
    Lcp Echo Rep Tx 0
    Lcp Echo Rep Rx 0
    Lcp Echo Req Timeout 0
    Lcp Echo Req Error 0
    Lcp Echo Rep Error 0
  MRRU 1486 droptime 0 maxfrag 0 minfrag 32 minmru 1482 maxqlen 3000
    TX: Packets 0 Frags 0 Txseq 0x0
    RX: Packets 24 Frags 24 Rxseq 0x18 mseq 23 maxdiff 1 reass 24
      fragments copied 0
  link 0 : seq 0x17 mru 1482 encapslen 8 qlen 0 context 0xea01eb0
```

show services l2tp radius

Syntax	<pre>show services l2tp radius <accounting (servers statistics)> <authentication (servers statistics)> <servers> <statistics></pre>
Release Information	Command introduced in Junos OS Release 9.0.
Description	(M7i, M10i, and M120 routers only) Display RADIUS servers and statistics information for the RADIUS servers configured on the router.
Options	<p>You must include one of the following keywords to provide a valid completion for the command:</p> <p>accounting (servers statistics)—(Optional) Display RADIUS servers or statistical accounting information only.</p> <p>authentication (servers statistics)—(Optional) Display RADIUS servers or statistical authentication information only.</p> <p>servers—(Optional) Display RADIUS authentication and accounting server information only.</p> <p>statistics—(Optional) Display RADIUS authentication and accounting statistics information only.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • L2TP Services Configuration Overview on page 4 • L2TP Minimum Configuration on page 9
List of Sample Output	show services l2tp radius servers on page 61 show services l2tp radius statistics on page 61
Output Fields	<p>Table 5 on page 59 lists the output fields for the show services l2tp radius command. Output fields are listed in the approximate order in which they appear.</p>

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.

Table 5: show services l2tp radius Output Fields (*continued*)

Field Name	Field Description
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.
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
17.1.1.1	Active	1812	2	25	0	2400	300	radius-key
133.122.1.1	Active	1812	5	35	0	2400	300	radius-key
134.141.1.1	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
172.128.30.176	Active	1812	3	3	0	2400	300	none-set
172.128.130.174	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
17.1.1.1	Active	1813	2	25	0	2400	300	radius-key
133.122.1.1	Active	1813	5	35	0	2400	300	radius-key
134.141.1.1	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
172.128.30.176	Active	1813	3	3	0	2400	300	none-set
172.128.130.174	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 17.1.1.1, 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 172.128.130.174, 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

show services l2tp session

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*>

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.

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 **none**—Display standard information about all active L2TP sessions.

brief | detail | extensive—(Optional) Display the specified level of output.

interface *interface-name*—(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:

- **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*—(Optional) Display L2TP session information for only the specified local gateway address.

local-gateway-name *gateway-name*—(Optional) Display L2TP session information for only the specified local gateway name.

local-session-id *session-id*—(Optional) Display L2TP session information for only the specified local session identifier.

local-tunnel-id *tunnel-id*—(Optional) Display L2TP session information for only the specified local tunnel identifier.

peer-gateway *gateway-address*—(Optional) Display L2TP session information for only the specified peer gateway address.

peer-gateway-name *gateway-name*—(Optional) Display L2TP session information for only the specified peer gateway name.

statistics—(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**.

tunnel-group *group-name*—(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 **show services service-sets memory-usage *group-name*** and **show services service-sets cpu-usage *group-name*** 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

Related Documentation

- [L2TP Services Configuration Overview on page 4](#)
- [L2TP Minimum Configuration on page 9](#)
- [clear services l2tp session on page 47](#)

List of Sample Output

- [show services l2tp session \(LNS on M Series Routers\) on page 67](#)
- [show services l2tp session \(LNS on MX Series Routers\) on page 67](#)
- [show services l2tp session \(LAC\) on page 67](#)
- [show services l2tp session detail \(LAC\) on page 67](#)
- [show services l2tp session extensive \(LAC\) on page 68](#)
- [show services l2tp session extensive \(LNS on M Series Routers\) on page 68](#)
- [show services l2tp session extensive \(LNS on MX Series Routers\) on page 69](#)
- [show services l2tp session statistics \(MX Series Routers\) on page 69](#)

Output Fields [Table 6 on page 64](#) 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"> • Established—Session is operating. This is the only state supported for the LAC. • closed—Session is being closed. • destroyed—Session is being destroyed. • clean-up—Session is being cleaned up. • lns-ic-accept-new—New session is being accepted. • lns-ic-idle—Session has been created and is idle. • lns-ic-reject-new—New session is being rejected. • lns-ic-wait-connect—Session is waiting for the peer's incoming call connected (ICCN) message. 	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
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	Transmit speed of the session conveyed from the LAC to the LNS, in bits per second (bps).	extensive
Rx speed	Receive speed of the session conveyed from the LAC to the LNS, in bits per second (bps).	extensive

Table 6: show services l2tp session Output Fields (*continued*)

Field Name	Field Description	Level of Output
Bearer type	Type of bearer enabled: <ul style="list-style-type: none"> • 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). • 1—Digital access requested. • 2—Analog access requested. • 4—Asynchronous Transfer Mode (ATM) bearer support. 	extensive
Framing type	Type of framing enabled: <ul style="list-style-type: none"> • 1—Synchronous framing • 2—Asynchronous framing 	extensive
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
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

Table 6: show services l2tp session Output Fields (*continued*)

Field Name	Field Description	Level of Output
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> • Control Tx—Amount of control information transmitted, in packets and bytes. • Control Rx—Amount of control information received, in packets and bytes. • Data Tx—Amount of data transmitted, in packets and bytes. • Data Rx—Amount of data received, in packets and bytes. • Errors Tx—Number of errors transmitted, in packets. • Errors Rx—Number of errors received, in packets. • LCP echo req Tx—Number of LCP echo requests transmitted, in packets. • LCP echo req Rx—Number of LCP echo requests received, in packets. • LCP echo rep Tx—Number of LCP echo responses transmitted, in packets. • LCP echo rep Rx—Number of LCP echo responses received, in packets. • LCP echo Req timeout—Number of LCP echo requests that timed out. • LCP echo Req error—Number of errors received for LCP echo packets. • LCP echo Rep error—Number of errors transmitted for LCP echo packets. 	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
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
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: 10.1.1.2:1701, Remote IP: 10.1.1.1:1701
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: 10.10.1.2:1701, Remote IP: 10.10.1.1:1701
    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 (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: 10.128.1.1:1701, Remote IP: 10.128.1.2:1701
    Username: usr1@juniper1.net, Assigned IP address: 10.50.2.1/32
    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: 10.128.11.1:1701, Remote IP: 10.128.11.2:1701
      Username: usr1@company.com, Assigned IP address: 10.46.2.3/24
      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: 11.1.1.2:1701, Remote IP: 11.1.1.3:1701
    Local name: lns-mx960, Remote name: testlac
    Tx speed: 56000, Rx speed: 0
    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

```

show services l2tp summary

Syntax	show services l2tp summary <statistics> <interface sp-fpc/pic/port>
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
Description	(M10i and M7i routers: LNS only. MX Series routers: LAC and LNS.) Display Layer 2 Tunneling Protocol (L2TP) summary information.
Options	<p>none—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.</p> <p>interface sp-fpc/pic/port—(Optional) Display L2TP summary information for only the specified adaptive services interface. This option is not available for L2TP on MX Series routers.</p> <p>statistics—(Optional) Display a summary of control packets and bytes transmitted and received.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> L2TP Services Configuration Overview on page 4 L2TP Minimum Configuration on page 9
List of Sample Output	show services l2tp summary (LAC on M Series routers) on page 72 show services l2tp summary (LAC on MX Series routers) on page 73 show services l2tp summary (LNS on MX Series routers) on page 73 show services l2tp summary (LNS on M Series routers) on page 73 show services l2tp summary statistics (MX Series routers) on page 73
Output Fields	Table 7 on page 70 lists the output fields for the show services l2tp summary command. Output fields are listed in the approximate order in which they appear.

Table 7: show services l2tp summary Output Fields

Field Name	Field Description
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 7: 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.
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 disable-failover-protocol statement has been issued and the LAC operates only in silent failover mode. Not displayed for LNS on M Series routers.
Tx connect speed method	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: <ul style="list-style-type: none"> • ancp • pppoe-ia-tag • static
Rx speed avp when equal	Indicates if the Rx connect speed when equal configuration is enabled or disabled .
Tunnel assignment id	Format of the tunnel name. Format of the tunnel name, based on RADIUS attributes returned from the AAA server: <ul style="list-style-type: none"> • authentication-id—Name consists of only Tunnel Assignment-Id [82]. This is the default value. • 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.

Table 7: 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"> • accept—Accepts change requests for the IP address or UDP port. This is the default action. • ignore—Ignores all change requests. • ignore-ip-address—Ignores change requests for the IP address but accepts them for the UDP port. • ignore-udp-port—Ignores change requests for the UDP port but accepts them for the IP address.
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.
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.
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
Failover within a preference level is Disabled
Weighted load balancing is Enabled
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
Failover within a preference level is Disabled
Weighted load balancing is Disabled
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 assignment id format is assignment-id
Tunnel Tx Address Change is Accept
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
Destinations: 0, Tunnels: 0, Sessions: 0, Switched sessions: 0

```

show services l2tp summary (LNS on MX Series routers)

```

user@host> show services l2tp summary
Failover within a preference level is Disabled
Weighted load balancing is Disabled
Tunnel authentication challenge is Enabled
Calling number avp is Enabled
Failover Protocol is Enabled
Tx Connect speed method is static
Destinations: 4, Tunnels: 19, Sessions: 65, Switched sessions: 2

```

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
Failover within a preference level is Disabled
Weighted 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
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
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	

show services l2tp tunnel

Syntax	<pre>show services l2tp tunnel <brief detail extensive> <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> <statistics> <tunnel-group group-name></pre>
Release Information	Command introduced before Junos OS Release 7.4.
Description	<p>(M10i and M7i routers only) Display information about active Layer 2 Tunneling Protocol (L2TP) tunnels for LNS.</p> <p>(MX Series routers only) Display information about L2TP tunnels for LAC and LNS.</p>
Options	<p>none—Display standard information about all active L2TP tunnels.</p> <p>brief detail extensive—(Default) Display the specified level of output.</p> <p>interface sp-fpc/pic/port—(Optional) Display L2TP tunnel information for only the specified adaptive services interface. This option is not available for L2TP on MX Series routers.</p> <p>local-gateway gateway-address—(Optional) Display L2TP tunnel information for only the specified local gateway address.</p> <p>local-gateway-name gateway-name—(Optional) Display L2TP tunnel information for only the specified local gateway name.</p> <p>local-tunnel-id tunnel-id—(Optional) Display L2TP tunnel information for only the specified local tunnel identifier.</p> <p>peer-gateway gateway-address—(Optional) Display L2TP tunnel information for only the specified peer gateway address.</p> <p>peer-gateway-name gateway-name—(Optional) Display L2TP tunnel information for only the specified peer gateway name.</p> <p>statistics—(Optional) Display the number of control packets and bytes transmitted and received for the tunnel. You cannot include this option with any of the level options, brief, detail, or extensive.</p> <p>tunnel-group group-name—(Optional) Display L2TP tunnel information for only the specified tunnel group.</p>
Required Privilege Level	view

- Related Documentation**
- [L2TP Services Configuration Overview on page 4](#)
 - [L2TP Minimum Configuration on page 9](#)

List of Sample Output

- [show services l2tp tunnel \(LAC\) on page 78](#)
- [show services l2tp tunnel detail \(LAC\) on page 78](#)
- [show services l2tp tunnel detail \(LAC on MX Series Routers\) on page 78](#)
- [show services l2tp tunnel detail \(LNS on MX Series Routers\) on page 78](#)
- [show services l2tp tunnel extensive \(LAC\) on page 79](#)
- [show services l2tp tunnel extensive \(LNS on M Series Routers\) on page 79](#)
- [show services l2tp tunnel extensive \(LNS on MX Series Routers\) on page 79](#)
- [show services l2tp tunnel statistics \(MX Series Routers\) on page 80](#)

Output Fields [Table 8 on page 76](#) lists the output fields for the **show services l2tp tunnel** command. Output fields are listed in the approximate order in which they appear.

Table 8: show services l2tp tunnel Output Fields

Field Name	Field Description
Interface	(LNS only) Name of an adaptive services interface.
Tunnel group	(LNS only) Name of a tunnel group.
Local ID	On the LNS, number assigned by the LNS that identifies the local endpoint of the tunnel relative to the LNS: the LNS. On the LAC, number assigned by the LAC that identifies the local endpoint of the tunnel relative to the LAC: the LAC.
Remote ID	On the LNS, number assigned by the LAC that identifies the remote endpoint of the tunnel relative to the LNS: the LAC. On the LAC, number assigned by the LNS that identifies the remote endpoint of the tunnel relative to the LAC: the LNS.
Remote IP	IP address of the peer endpoint of the tunnel.
Sessions	Number of L2TP sessions established through the tunnel.

Table 8: show services l2tp tunnel Output Fields (*continued*)

Field Name	Field Description
State	<p>State of the L2TP tunnel:</p> <ul style="list-style-type: none"> • cc_responder_accept_new—The tunnel has received and accepted the start control connection request (SCCRQ). • cc_responder_reject_new—The tunnel has received and rejected the SCCRQ. • cc_responder_idle—The tunnel has just been created. • cc_responder_wait_ctl_conn—The tunnel has sent the start control connection response (SCCRP) and is waiting for the start control connection connected (SCCCN) message. • clean-up—The tunnel is being cleaned up. • closed—The tunnel is being closed. • destroyed—The tunnel is being destroyed. • Established—The tunnel is operating. This is the only state supported for the LAC. • Terminate—The tunnel is terminating. • Unknown—The tunnel is not connected to the router.
Tunnel Name	(LAC only) Name of the created tunnel. This value includes the destination name followed by the value of the RADIUS Tunnel-Assignment-ID VSA [82].
Local IP	IP address of the local endpoint of the tunnel.
Local name	Name used for local tunnel endpoint during tunnel negotiation.
Remote name	Name used for remote tunnel endpoint during tunnel negotiation.
Effective Peer Resync Mechanism	<p>(LAC only) Peer resynchronization mechanism (PRM) in effect for the tunnel:</p> <ul style="list-style-type: none"> • Failover protocol • Silent failover—Recovery takes place in the failed endpoint only using the proprietary silent failover protocol.
Tunnel Logical System	Logical system in which the L2TP tunnel is brought up.
Tunnel Routing Instance	Routing instance in which the L2TP tunnel is brought up.
Max sessions	Maximum number of sessions that can be established on this tunnel.
Window size	Number of control messages that can be sent without receipt of an acknowledgment.
Hello interval	Interval between the transmission of hello messages, in seconds.
Create time	Date and time when the tunnel was created. While the LNS and LAC are connected, this value should correspond to the router's uptime. If connection to the LAC is severed, the State changes to Unknown and the Create time value resets.
Up time	Amount of time elapsed since the tunnel became active, in hours, minutes, and seconds.

Table 8: show services l2tp tunnel Output Fields (*continued*)

Field Name	Field Description
Idle time	Amount of time elapsed since the tunnel became idle, in hours, minutes, and seconds.
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> • Control Tx—Amount of control information transmitted, in packets and bytes. • Control Rx—Amount of control information received, in packets and bytes. • Data Tx—Amount of data transmitted, in packets and bytes. • Data Rx—Amount of data received, in packets and bytes. • Errors Tx—Number of errors transmitted, in packets. • Errors Rx—Number of errors received, in packets.

Sample Output

show services l2tp tunnel (LAC)

```

user@host> show services l2tp tunnel
  Local ID  Remote ID  Remote IP          Sessions  State
      17185           1  10.10.1.1:1701         1  Established

```

show services l2tp tunnel detail (LAC)

```

user@host> show services l2tp tunnel detail
Tunnel local ID: 31889, Tunnel remote ID: 1
Remote IP: 100.1.1.1:1701
Sessions: 1, State: Established
Tunnel Name: 1/tunnel-to-LNS-1
Local IP: 100.1.1.2:1701
Local name: ce-lac, Remote name: ce-lns
Effective Peer Resync Mechanism: silent failover

```

show services l2tp tunnel detail (LAC on MX Series Routers)

```

user@host> show services l2tp tunnel detail
Tunnel local ID: 17301, Tunnel remote ID: 1
Remote IP: 10.10.1.1:1701
Sessions: 1, State: Established
Tunnel Name: 2/tunnel-to-LNS-2
Local IP: 100.1.1.2:1701
Local name: ce-lac, Remote name: ce-lns
Effective Peer Resync Mechanism: silent failover
Tunnel Logical System: default, Tunnel Routing Instance: default

```

show services l2tp tunnel detail (LNS on MX Series Routers)

```

user@host> show services l2tp tunnel detail
Tunnel local ID: 17301, Tunnel remote ID: 1
Remote IP: 12.1.1.15:1701
Sessions: 1, State: Established
Tunnel Name: 2/2
Local IP: 12.1.1.5:1701
Local name: ce-bras-mx240-e, Remote name: testlac2

```

Effective Peer Resync Mechanism: silent failover
 Tunnel Logical System: default, Tunnel Routing Instance: vrf1

show services l2tp tunnel extensive (LAC)

```
user@host> show services l2tp tunnel extensive
Tunnel local ID: 17185, Tunnel remote ID:      1
Remote IP: 10.10.1.1:1701
Sessions: 1, State: Established
Tunnel Name: 2/tunnel-to-LNS-2
Local IP: 100.1.1.2:1701
Local name: ce-lac, Remote name: ce-lns
Effective Peer Resync Mechanism: failover protocol
Max sessions: 32000, Window size: 4, Hello interval: 60
Create time: Tue Nov  9 15:23:29 2010, Up time: 00:00:26
Idle time: 00:00:00
```

show services l2tp tunnel extensive (LNS on M Series Routers)

```
user@host> show services l2tp tunnel extensive
Interface: sp-1/2/0, Tunnel group: group1
Tunnel local ID: 62746, Tunnel remote ID: 16930
Remote IP: 10.128.1.2:1701
Sessions: 1, State: Established
Local IP: 10.128.1.1:1701
Local name: router-1, Remote name: router-2
Max sessions: 50, Window size: 32, Hello interval: 60
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:14:58
Idle time: 00:00:07
Statistics since: Tue Mar 23 14:13:13 2004
```

	Packets	Bytes
Control Tx	80	1152
Control Rx	3	272
Data Tx	0	0
Data Rx	450	28.0k
Errors Tx	0	
Errors Rx	0	

```
Interface: sp-1/2/0, Tunnel group: group_company_dns
Tunnel local ID: 37266, Tunnel remote ID: 36217
Remote IP: 10.128.11.2:1701
Sessions: 1, State: Established
Local IP: 10.128.11.1:1701
Local name: router-1, Remote name: router-2
Max sessions: unlimited, Window size: 32, Hello interval: 60
Create time: Tue Mar 23 14:13:15 2004, Up time: 01:14:59
Idle time: 01:14:55
Statistics since: Tue Mar 23 14:13:13 2004
```

	Packets	Bytes
Control Tx	81	1164
Control Rx	3	273
Data Tx	0	0
Data Rx	1	80
Errors Tx	0	
Errors Rx	0	

show services l2tp tunnel extensive (LNS on MX Series Routers)

```
user@host> show services l2tp tunnel extensive
Tunnel local ID: 40553, Tunnel remote ID: 1
Remote IP: 192.168.1.3:1701
Sessions: 1, State: Established
```

```
Tunnel Name: 3/1838
Local IP: 10.1.1.2:1701
Local name: lns-mx960, Remote name: testlac
Effective Peer Resync Mechanism: silent failover
Tunnel Logical System: default, Tunnel Routing Instance: vrf1
Max sessions: 60000, Window size: 4, Hello interval: 60
Create time: Mon Apr 25 20:27:50 2011, Up time: 00:01:11
Idle time: 00:00:00, ToS Reflect: Enabled
Tunnel Group Name: tg1
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	6	64
Errors Tx	0	
Errors Rx		

show services l2tp tunnel statistics (MX Series Routers)

```
user@host>show services l2tp tunnel statistics
Tunnel local ID: 17185, Tunnel remote ID: 1
Sessions: 31.8k, State: Established
Statistics since: Mon Aug 1 13:21:38 2011
```

	Packets	Bytes
Control Tx	90.3k	9.0M
Control Rx	32.0k	1296.9k
Data Tx	127.3k	1591.6k
Data Rx	100.8k	1273.4k
Errors Tx	0	
Errors Rx	0	

show services l2tp user

Syntax	show services l2tp user <brief detail extensive statistics> <user <i>username</i> >
Release Information	Command introduced before Junos OS Release 7.4.
Description	(M10i and M7i routers only) Display a list of active Layer 2 Tunneling Protocol (L2TP) users.
Options	<p>none—Display all active L2TP users.</p> <p>brief detail extensive statistics—(Optional) Display the specified level of output. Use the statistics option to display L2TP user statistics.</p> <p>user <i>username</i>—(Optional) Display L2TP user information for only the specified username.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • L2TP Services Configuration Overview on page 4 • L2TP Minimum Configuration on page 9
List of Sample Output	show services l2tp user extensive on page 83
Output Fields	Table 9 on page 81 lists the output fields for the show services l2tp user command. Output fields are listed in the approximate order in which they appear.

Table 9: show services l2tp user Output Fields

Field Name	Field Description
Interface	Name of an adaptive services interface.
Tunnel group	Name of a tunnel group.
Tunnel local ID	Local identifier of the tunnel, as assigned by the L2TP network server (LNS).
Session local ID	Local identifier of the session, as assigned by the L2TP network server (LNS).
Session remote ID	Remote identifier of the session, as assigned by the L2TP access concentrator (LAC).

Table 9: show services l2tp user Output Fields (*continued*)

Field Name	Field Description
State	State of the L2TP session: <ul style="list-style-type: none"> • Established—The session is operating. • closed—The session is being closed. • destroyed—The session is being destroyed. • clean-up—The session is being cleaned up. • Ins-ic-accept-new—A new session is being accepted. • Ins-ic-idle—The session has been created and is idle. • Ins-ic-reject-new—The new session is being rejected. • Ins-ic-wait-connect—The session is waiting for the peer's incoming call connected (ICCN) message.
Mode	Mode of the interface representing the session: shared or exclusive .
Local IP	IP address of the local endpoint of the tunnel.
Remote IP	IP address of the peer endpoint of the tunnel.
Username	Name of the user logged in to the session.
Assigned IP address	IP address assigned to remote client.
Local name	Name of the local device.
Remote name	Name of the remote device.
Local MRU	Maximum receive unit (MRU) setting of the local device, in bytes.
Remote MRU	MRU setting of the remote device, in bytes.
Tx speed	Transmit speed of the tunnel session, in bps.
Rx speed	Receive speed of the tunnel session, in bps.
Bearer type	Type of bearer enabled: <ul style="list-style-type: none"> • 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) • 1—Digital access requested • 2—Analog access requested • 4—Asynchronous Transfer Mode (ATM) bearer support
Framing type	Type of framing enabled: <ul style="list-style-type: none"> • 1—Synchronous framing • 2—Asynchronous framing
LCP renegotiation	Whether Link Control Protocol (LCP) renegotiation is configured: On or Off .

Table 9: show services l2tp user Output Fields (*continued*)

Field Name	Field Description
Authentication	Type of authentication algorithm used: Challenge Handshake Authentication Protocol (CHAP) or Password Authentication Protocol (PAP).
Interface ID	Name of the logical unit.
Interface unit	Logical unit number.
Call serial number	Unique serial number assigned to the call.
Create time	Date and time when the call was created.
Up time	Amount of time elapsed since the call became active, in hours, minutes, and seconds.
Idle time	Amount of time elapsed since the call became idle, in hours, minutes, and seconds.
Statistics since	<p>Date and time when collection of the following statistics began:</p> <ul style="list-style-type: none"> • Control Tx—Amount of control information transmitted, in packets and bytes. • Control Rx—Amount of control information received, in packets and bytes. • Data Tx—Amount of data transmitted, in packets and bytes. • Data Rx—Amount of data received, in packets and bytes. • Errors Tx—Number of errors transmitted, in packets. • Errors Rx—Number of errors received, in packets.

Sample Output

show services l2tp user extensive

```

user@host> show services l2tp user extensive
Interface: sp-1/2/0, Tunnel group: group1, Tunnel local ID: 62746
Session local ID: 56793, Session remote ID: 53304
State: Established, Mode: shared
Local IP: 10.128.1.1:1701, Remote IP: 10.128.1.2:1701
Username: usr1@juniper_1.net, Assigned IP address: 10.50.2.1/32
Local name: router-1, Remote name: router-2
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
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, Username: usr1@company_dns.com, Mode: shared
Local IP: 10.128.11.1:1701, Remote IP: 10.128.11.2:1701
Username: usr1@company_dns.com, Assigned IP address: 10.48.1.1/32
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
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	

PART 4

Index

- [Index on page 87](#)

Index

Symbols

#, comments in configuration statements.....	x
(), in syntax descriptions.....	x
< >, in syntax descriptions.....	x
[], in configuration statements.....	x
{ }, in configuration statements.....	x
(pipe), in syntax descriptions.....	x

A

alert (system logging severity level).....	15
any (system logging severity level).....	15
AS PIC	
redundancy.....	5

B

braces, in configuration statements.....	x
brackets	
angle, in syntax descriptions.....	x
square, in configuration statements.....	x

C

clear services l2tp destination command.....	44
clear services l2tp destination statistics	
command.....	45
clear services l2tp multilink command.....	46
clear services l2tp session command.....	47
clear services l2tp session statistics command.....	49
clear services l2tp tunnel command.....	51
clear services l2tp tunnel statistics command.....	53
comments, in configuration statements.....	x
conventions	
text and syntax.....	ix
critical (system logging severity level).....	15
curly braces, in configuration statements.....	x
customer support.....	xi
contacting JTAC.....	xi

D

dial-options statement	
interfaces	
usage guidelines.....	16

documentation	
comments on.....	x

E

emergency (system logging severity level).....	15
error (system logging severity level).....	15

F

facility-override statement.....	25
font conventions.....	ix

H

hello-interval statement	
L2TP.....	26
usage guidelines.....	14
hide-avps statement.....	27
usage guidelines.....	14
host statement	
L2TP.....	27
usage guidelines.....	14

I

info (system logging severity level).....	15
---	----

L

L2TP	
access profile.....	11, 12
attribute-value pairs.....	14
example configuration.....	21
redundancy.....	5
timers.....	14
L2TP LAC services	
destination	
clearing.....	44, 45
L2TP services	
multilink sessions	
clearing.....	46
displaying.....	55
RADIUS information.....	59
session statistics	
clearing.....	49
sessions	
clearing.....	47
displaying.....	63
summary information, displaying.....	70
tunnel statistics, clearing.....	53
tunnels, clearing.....	51
tunnels, displaying.....	75
user information, displaying.....	81

L2TP statements	
LAC	
traceoptions.....	35
LNS	
l2tp-access-profile.....	28
service-interface.....	32
traceoptions.....	35
l2tp-access-profile statement.....	28
usage guidelines.....	12
l2tp-interface-id statement	
usage guidelines.....	16
l2tp-profile statement	
usage guidelines.....	11
local-gateway address statement.....	28
usage guidelines.....	13
log-prefix statement	
L2TP.....	29
usage guidelines.....	14
M	
manuels	
comments on.....	x
maximum-send-window statement.....	29
usage guidelines.....	13
N	
notice (system logging severity level).....	15
P	
parentheses, in syntax descriptions.....	x
ppp-access-profile statement.....	30
usage guidelines.....	12
ppp-profile statement	
usage guidelines.....	11
R	
RADIUS information	
displaying.....	59
receive-window statement.....	30
usage guidelines.....	13
redundancy	
L2TP.....	5
retransmit-interval statement.....	31
usage guidelines.....	14
S	
service-interface statement.....	32
usage guidelines.....	13
services statement	
L2TP	
usage guidelines.....	14
show services l2tp multilink command.....	55
show services l2tp radius command.....	59
show services l2tp session command.....	63
show services l2tp summary command.....	70
show services l2tp tunnel command.....	75
show services l2tp user command.....	81
statement	
L2TP	
usage guidelines.....	18
support, technical See technical support	
syntax conventions.....	ix
syslog statement	
L2TP.....	34
usage guidelines.....	14
T	
technical support	
contacting JTAC.....	xi
traceoptions statement	
L2TP.....	35
tunnel-group statement.....	39
usage guidelines.....	11
tunnel-timeout statement.....	40
usage guidelines.....	14
W	
warning (system logging severity level).....	15