Chapter 22

Configuring QoS for L2TP Sessions

This chapter provides information for configuring QoS for L2TP sessions.

QoS topics are discussed in the following sections:

Providing QoS for L2TP Overview

The JUNOSe software supports QoS queues and scheduler nodes for L2TP session interfaces. L2TP QoS provides per–L2TP session queuing and allows QoS profiles to be dynamically attached to L2TP session interfaces on E-series routers. The routers can be configured as either an LAC or LNS.

The dynamic attachment process uses RADIUS and AAA, enabling a QoS profile to be attached to a dynamic L2TP session interface when the newly created interface has the QoS-Profile-Name [26-26] RADIUS VSA associated with it. L2TP QoS support gives you the ability to shape tunneled users through L2TP interfaces.

L2TP QoS profiles are attached at the L2TP session interface, except on the LNS with nonmultilink interfaces. On the LNS with nonmultilink interfaces, L2TP QoS profiles are attached at the IP interface. The queues and scheduler node are built at the L2TP client interface on the line module.

Sample Scheduler Hierarchies for L2TP

The figures in this section show the different scheduler hierarchies that you can build for QoS over L2TP. The type of networking architecture in which the QoS profile is used determines the actual hierarchy that is built.

Figure 52 through Figure 56 show scheduler hierarchies for different networking architectures.

Figure 52: LNS (Non-MLPPP) Scheduler Hierarchy

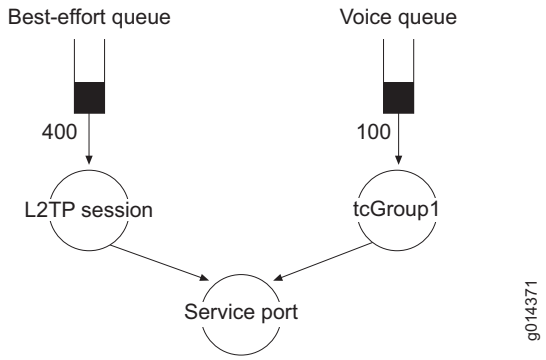


Figure 53: LNS (MLPPP) QoS Scheduler Hierarchy

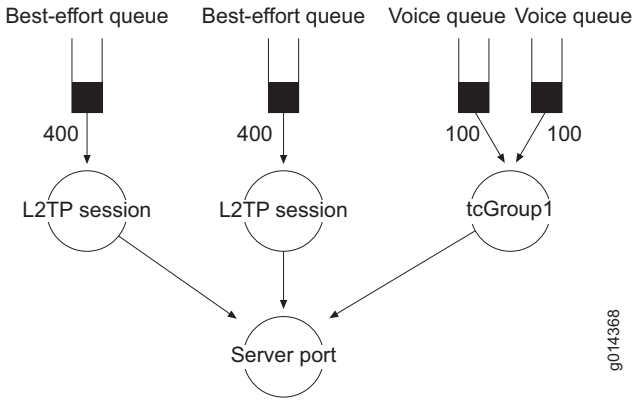


Figure 54: LAC over Ethernet (Without VLANs) Scheduler Hierarchy

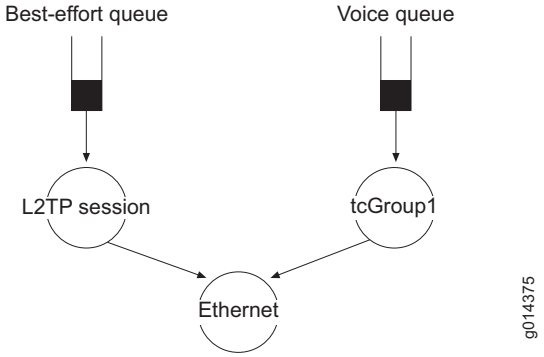


Figure 55: LAC over Ethernet (With LANs) Scheduler Hierarchy

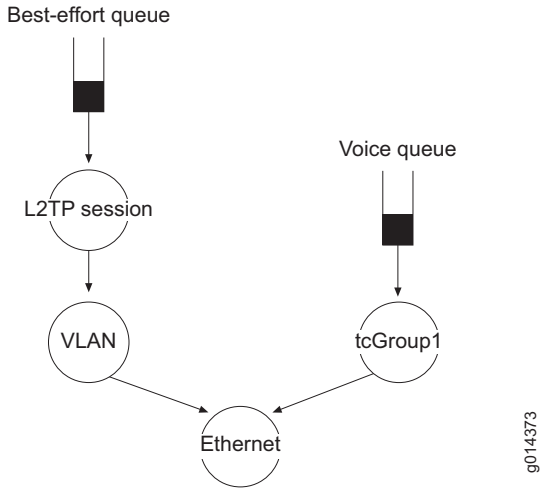
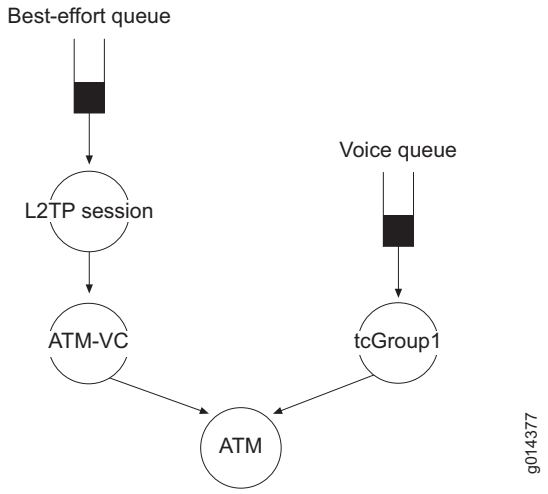


Figure 56: LAC over ATM



Related Topics

- Configuring QoS for an L2TP Session on page 209

Configuring QoS for an L2TP Session

This section provides general procedures for configure QoS for an L2TP LNS session or a LAC L2TP session.

For both procedures, the resulting scheduler hierarchy depends on the type of network architecture that you use.

L2TP session interfaces have default QoS profiles and scheduler nodes. The default configuration includes the following settings:

```
host1(config)#show qos-profile l2tp-session-default

t-class   interface   rule    traffic   scheduler  queue   drop   statistics
 group      type      type     class     profile  profile profile  profile
-------- ------------ ----- ----------- --------- ------- ------- ----------
         l2tp-session queue best-effort default   default default default
```

Configuring QoS for an L2TP LNS Session

When you configure QoS for an LNS, you must modify the server-default QoS profile to remove the **best-effort** traffic class rule from the IP interface type. This enables you to create L2TP session queues, and is not required to provide QoS on an LAC.

Before you configure QoS for an L2TP LNS session:

- Configure the traffic classes.

  See *Configuring Traffic Classes That Define Service Levels* on page 15.

- Configure the queuing hierarchy.

  See *Configuring Queue Profiles to Manage Buffers and Thresholds* on page 22.

- Configure the scheduler hierarchy and shaping with scheduler profiles.

  See *Configuring a Scheduler Hierarchy* on page 47.

To configure QoS for an L2TP LNS session:

1. Remove the **best-effort** traffic class rule from the IP interface type of the server-default QoS profile.

   ```
   host1(config)#qos-profile server-default
   host1(config-qos-profile)#no ip queue traffic-class best-effort
   host1(config-qos-profile)#exit
   ```

2. Create a traffic-class group, and enter Traffic Class Group Configuration mode. Add the traffic class voice to the new group.

   ```
   host1(config)#traffic-class-group tcGroup1
   host1(config-traffic-class-group)#traffic-class voice
   host1(config-traffic-class-group)#exit
   ```

3. Configure the QoS profile.

   a. Create the QoS profile, and enter QoS Profile Configuration mode.

   ```
   host1(config)#qos-profile l2tpQpro25
   host1(config-qos-profile)#
   ```

   b. Add queues for L2TP session interfaces to the QoS profile.

   ```
   host1(config-qos-profile)#lt2p-session queue traffic-class best-effort
   scheduler-profile 400k
   host1(config-qos-profile)#lt2p-session queue traffic-class voice scheduler-profile
   100k
   host1(config-qos-profile)#exit
   host1(config)#
   ```

4. Attach the QoS profile to the interface on which you have configured L2TP.

   ```
   host1(config)#interface gigabitEthernet 6/0
   host1(config-if)#qos-profile
   ```

5. (Optional) Verify the new QoS profile configuration.

   ```
   host1(config)#show qos-profile l2tpQpro25

   qos-profile l2tpQpro25:
   t-class  interface    rule    traffic   scheduler  queue   drop   statistics
    group     type       type     class     profile  profile profile  profile
   -------- ---------    ----- ----------- --------- ------- ------- ----------
            l2tp-session queue best-effort 400k      default default default
   tcGroup1 l2tp-session queue voice       100k      default default default
   ```

Configuring QoS for an L2TP LAC Session

Before you configure QoS for an L2TP LAC session:

- Configure traffic classes.

  See *Configuring Traffic Classes That Define Service Levels* on page 15.

- Configure the traffic classes.

  See *Configuring Traffic Classes That Define Service Levels* on page 15.

- Configure the queuing hierarchy.

  See *Configuring Queue Profiles to Manage Buffers and Thresholds* on page 22.

- Configure the scheduler hierarchy and shaping with scheduler profiles.

  See *Configuring a Scheduler Hierarchy* on page 47.

To configure QoS for an L2TP LAC session:

1. Configure the QoS profile.

   a. Create the QoS profile, and enter QoS Profile Configuration mode.

   ```
   host1(config)#qos-profile l2tpQpro25
   host1(config-qos-profile)#
   ```

   b. Add queues for L2TP session interfaces to the QoS profile.

   ```
   host1(config-qos-profile)#lt2p-session queue traffic-class best-effort
   scheduler-profile 400k
   host1(config-qos-profile)#lt2p-session queue traffic-class voice scheduler-profile
   100k
   host1(config-qos-profile)#exit
   host1(config)#
   ```

2. Attach the QoS profile to the interface on which you have configured L2TP.

   ```
   host1(config)#interface gigabitEthernet 6/0
   host1(config-if)#qos-profile l2tpQpro25
   ```

3. (Optional) Verify the new QoS profile configuration.

   ```
   host1(config)#show qos-profile l2tpQpro25

   qos-profile l2tpQpro25:
   t-class  interface    rule    traffic   scheduler  queue   drop   statistics
    group     type       type     class     profile  profile profile  profile
   -------- ---------    ----- ----------- --------- ------- ------- ----------
            l2tp-session queue best-effort 400k      default default default
   tcGroup1 l2tp-session queue voice       100k      default default default
   ```

Related Topics

- Supported Interface Types for QoS Profiles on page 135
- Sample Scheduler Hierarchies for L2TP on page 207
- **group** command
- **interface** command
- **qos-profile** command
- **queue** command
- **scheduler-profile** command
- **show qos-profile** command
- **traffic-class** command

Configuring QoS for Tunnel-Server Ports for L2TP LNS Sessions

You can configure QoS for a tunnel-service port that can be used as a dynamic interface associated with an L2TP LNS session.

Before you configure QoS for a tunnel-server port:

- Configure the dedicated or shared tunnel-server port.

  See *Configuring Tunnel-Server Ports and Tunnel-Service Interfaces* in *JUNOSe Physical Layer Configuration Guide, Chapter 6, Managing Tunnel-Service and IPSec-Service Interfaces*.

- Configure the traffic classes.

  See *Configuring Traffic Classes That Define Service Levels* on page 15.

- Configure the queuing hierarchy.

  See *Configuring Queue Profiles to Manage Buffers and Thresholds* on page 22.

- Configure the scheduler hierarchy and shaping with scheduler profiles.

  See *Configuring a Scheduler Hierarchy* on page 47.

To configure QoS for the tunnel-server port:

1. Create the QoS profile.

   host1(config)#**qos-profile lns-tsport**

2. Configure group nodes for the tunnel-server ports.

   host1(config-qos-profile)#**ip queue traffic-class best-effort scheduler-profile business-data queue-profile data**
   host1(config-qos-profile)#**ip queue traffic-class video scheduler-profile video queue-profile video**
   host1(config-qos-profile)#**ip queue traffic-class voice scheduler-profile voice queue-profile voice**
   host1(config-qos-profile)#**server-port group video**
   host1(config-qos-profile)#**server-port group data**
   host1(config-qos-profile)#**server-port group voice scheduler-profile strict-priority**

3. Attach the QoS profile to the tunnel-server port.

   host1(config)#**tunnel-server 3/0/0**
   host1(config)#**qos-profile lns-tsport**

Related Topics

- For more information about tunnel-server ports, see *JUNOSe Physical Layer Configuration Guide, Chapter 6, Managing Tunnel-Service and IPSec-Service Interfaces*
- **group** command
- **interface** command
- **node** command
- **qos-profile** command
- **queue** command
- **scheduler-profile** command
- **traffic-class** command
- **tunnel-server** command

QoS and L2TP TX Speed AVP 24 Overview

You can configure the router to use QoS settings to calculate the transmit connect speed of the subscriber's access interface reported for an L2TP tunneled session. The router reports the transmit connect speed in L2TP Transmit (TX) Speed AVP 24. During the establishment of an L2TP tunneled session, the LAC sends AVP 24 to the LNS to convey the transmit speed of the subscriber's access interface.

Logical Interfaces and Shared-Shaping Rates

You can configure QoS to control the rate for any of the logical interfaces of the following interface columns:

- ATM 1483 subinterface over ATM VP over ATM interface
- PPPoE subinterface over Ethernet interface
- PPPoE subinterface over VLAN subinterface over Ethernet interface

For those logical interfaces with a rate controlled by QoS, QoS reports this configured rate as the transmit connect speed for that interface. For the logical interfaces that do not have a QoS-configured rate, QoS reports the speed of the underlying physical port as the transmit connect speed.

For each logical interface, QoS determines the rate of the interface using either the shaping rate or the shared-shaping rate, if one is configured. The numeric value of the shaping rate or shared-shaping rate is determined as the result of a provider-specified arithmetic expression in a scheduler profile. This expression can either be a constant value, such as 1,000,000, or an expression using QoS parameters, with values supplied by RADIUS or statically in non-volatile storage (NVS).

If the QoS profile or the QoS parameters are configured in RADIUS, these values are used in computing the rate at the time of login. The system can subsequently modify the value of parameters through change of authorization (CoA), Service Manager, or L2C. Modifications are not reflected in the rate QoS reports because they might take place after the LAC has sent the message that contains AVP 24.

Shaping Mode

When the QoS shaping mode is set to cell for an interface, QoS reports the ATM rate. In cell mode, user-specified rates account for cell headers and trailers, which are ATM native rates; therefore, QoS does not convert the rates for AVP 24.

Related Topics

- For information about how to configure the transmit connect speed, see *Configuring the Transmit Connect Speed Calculation Method* in *JUNOSe Broadband Access Configuration Guide, Chapter 13, Configuring an L2TP LNS*
- For information about shared-shaping rates, see *Simple Shared Shaping Overview* on page 79 and *Compound Shared Shaping Overview* on page 101
- For information about QoS parameters that are configured in RADIUS, see *QoS Parameter Overview* on page 219

Monitoring QoS Configurations for L2TP

To monitor QoS configurations for L2TP:

- Monitoring the QoS Configuration of Fast Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet Interfaces on page 338
- Monitoring the QoS Configuration of IEEE 802.3ad Link Aggregation Group Bundles on page 340
- Monitoring the QoS Configuration of IP Interfaces on page 337
- Monitoring the QoS Profiles Attached to an Interface on page 331
- Monitoring the Configuration of QoS Port-Type Profiles on page 333
- Monitoring the Configuration of QoS Profiles on page 333
- Monitoring the QoS Scheduler Hierarchy on page 318
- Monitoring Shared Shapers on page 323