



# Upstream PPPoX Connection Speed Transfer at LAC

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The Upstream PPPoX Connection Speed Transfer at LAC feature allows the transfer of the upstream PPPoX session speed value at the Layer 2 Tunnel Protocol (L2TP) access concentrator (LAC). This transfer is accomplished by configuring the required speed on the ATM virtual circuit (VC) carrying the PPPoX session and then transferring this information into attribute-value (AV) pair 38 for transport from the LAC to the L2TP network server (LNS).



## Note

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PPPoX is a term used to refer to PPPoE, PPPoA, and PPPoEoA. All are implementations of PPP over various delivery protocols such as Ethernet and ATM.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Prerequisites for Upstream PPPoX Connection Speed Transfer at LAC

- You must understand the concepts described in the *Preparing for Broadband Access Aggregation* module.
- You must establish PPPoE sessions using the procedures in the *Providing Protocol Support for Broadband Access Aggregation of PPPoE Sessions* module.

## Restrictions for Upstream PPPoX Connection Speed Transfer at LAC

The following restrictions apply to the Upstream PPPoX Connection Speed Transfer at LAC feature:

- For PPPoE, all sessions over the same VC must have the same send and receive speed.
- The upstream speed is informational and does not imply any policing or shaping of the session speed.

## Information About Upstream PPPoX Connection Speed Transfer at LAC

### Upstream PPPoX Connection Speed Transfer at LAC

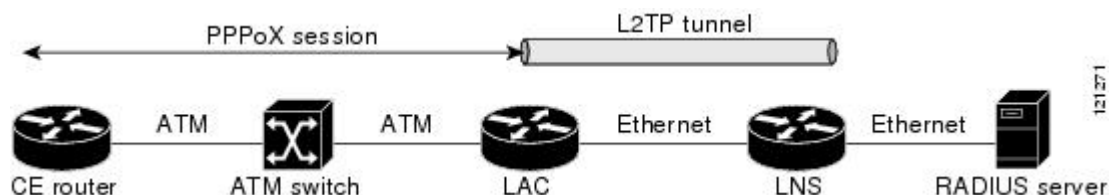
The send speed from the LAC to the remote destination is copied into AV pair 38 so that the session is symmetric at the LNS. The LNS does not do any policing of the upstream rate but verifies the session speed against the Service Level Agreement (SLA) before accepting it.

The transfer of the upstream PPPoX session speed at the LAC is done by:

- Configuring the required speed on the ATM virtual circuit carrying the PPPoX session.
- Transferring the information to AV pair 38 for transport from the LAC to the LNS.

The figure below shows how the Upstream PPPoX Connection Speed Transfer at LAC feature works.

**Figure 1: Upstream PPPoX Connection Speed Transfer at LAC**



## Benefits of Upstream PPPoX Connection Speed Transfer at LAC

The Upstream PPPoX Connection Speed Transfer at LAC feature enables the configuration of an upstream PPPoX session speed, which is different from the downstream speed and allows the transfer of the upstream speed value from the LAC to the LNS. The default state (before this feature is enabled) is that the upstream speed and the downstream speed are the same. This feature implements changes that allows asymmetry in the upstream and downstream speeds.

This feature provides the following benefits:

- Allows support for asymmetric broadband service speeds such as asymmetric digital subscriber line (ADSL).
- Complies with RFC 2661 for L2TP.
- Is required for regulatory compliance in certain European countries; for example, Germany.

## How to Configure Upstream Connection Speed Transfer at LAC

### Configuring Upstream PPPoX Connection Speed Transfer at the LAC

The tasks in this section configure upstream PPPoX connection speed transfer at the LAC on a PVC or VC:

#### Configuring Upstream PPPoX Connection Speed Transfer at LAC on a PVC

Perform this task to configure the Upstream PPPoX Connection Speed Transfer feature at the LAC on a PVC.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm slot / port . [subinterface-number {mpls | multipoint| point-to-point}]**
4. **range [range-name] pvc start-vpi / start-vci end-vpi / end-vci**
5. **rx-speed incoming-cell-rate**
6. **exit**

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.

	Command or Action	Purpose
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>interface atm slot / port .[subinterface-number{mpls   multipoint  point-to-point}]</b>  <b>Example:</b> Router(config)# interface atm 2/0.1 multipoint	Enters subinterface configuration mode.
Step 4	<b>range [range-name] pvc start-vpi / start-vci end-vpi / end-vci</b>  <b>Example:</b> Router(config-subif)# range pvc 0/100 0/110	Enters PVC-in-range configuration mode.
Step 5	<b>rx-speed incoming-cell-rate</b>  <b>Example:</b> Router(config-if-atm-range)# rx-speed 128	Allows L2TP to send AV pair 38 with the given value to LNS.  • The valid range for <i>incoming-cell-rate</i> for L2TP AVP is from 0 to 44209 kb/s.
Step 6	<b>exit</b>  <b>Example:</b> Router(config-if-atm-range)# exit	Exits PVC-in-range configuration mode.

## Configuring Upstream PPPoX Connection Speed Transfer at LAC on VC

Perform this task to configure the Upstream PPPoX Connection Speed Transfer at LAC on a VC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm slot / port .[subinterface-number{mpls | multipoint | point-to-point}]**
4. **pvc [name] {vpi/vci | vci} [ces | ilmi | qsaal | smds | l2transport]**
5. **rx-speed incoming-cell-rate**
6. **encapsulation {aal2 | aal5auto | aal5autopp} virtual-template number [group group-name] | aal5ciscoppp virtual-template number | aal5mux protocol | aal5nlpid | aal5snap}**
7. **exit**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>interface atm slot / port . [subinterface-number {mpls   multipoint   point-to-point}]</b>  <b>Example:</b> Router(config)# interface atm 2/0.1 multipoint	Enters subinterface configuration mode.
Step 4	<b>pvc [name] {vpi/vci   vci} [ces   ilmi   qsaal   smds   l2transport]</b>  <b>Example:</b> Router(config-subif)# pvc pvc1 0/100	Enters PVC-class configuration mode.
Step 5	<b>rx-speed incoming-cell-rate</b>  <b>Example:</b> Router(config-if-atm-vc)# rx-speed 128	Allows L2TP to send (AV) pair 38 with the given value to LNS.
Step 6	<b>encapsulation {aal2   aal5auto   aal5autoppv virtual-template number [group group-name]   aal5ciscoppv virtual-template number   aal5mux protocol   aal5nlpid   aal5snap}</b>  <b>Example:</b> Router(config-if-atm-vc)# encapsulation aal5snap	Configures Logical Link Control (LLC) Subnetwork Access Protocol (SNAP) encapsulation on the PVC.
Step 7	<b>exit</b>  <b>Example:</b> Router(config-if-atm-vc)# exit	Exits PVC-class configuration mode.

# Configuration Examples for Upstream PPPoX Connection Speed Transfer at LAC

## Configuring Upstream PPPoX Connection Speed Transfer at LAC Example

The following examples show how to configure the upstream PPPoX connection speed transfer at LAC in PVC, range PVC, and PVC-in-range modes.

### PVC Class

```
interface atm 6/0.110 multipoint
 pvc 0/600
  rx-speed 128
  encapsulation aal5snap
 exit
```

### Range PVC

```
interface atm 6/0.110 multipoint
 range range-pppoa-1 pvc 100 4/199
  rx-speed 400
 exit
```

### PVC-in-Range

```
interface atm 6/0.110 multipoint
 range range1 pvc 100 4/199
 pvc-in-range 0/300
 rx-speed 200
 shutdown
```

## Additional References

The following sections provide references related to the upstream PPPoX connection speed transfer.

### Related Documents

Related Topic	Document Title
Configuring VC classes	"Configuring VC Classes" section in the "Configuring ATM" module in the <i>Cisco IOS Wide-Area Networking Configuration Guide</i> .
Understanding the Unspecified Bit Rate+ (UBR+) service category for ATM VCs	"Understanding the UBR+ Service Category for ATM VCs" module in <a href="#">ATM (Asynchronous Transfer Mode) Technical Support</a>
Broadband access aggregation concepts	Understanding Broadband Access Aggregation module

Related Topic	Document Title
Preparing for broadband access aggregation task	Preparing for Broadband Access Aggregation module
BBDSL commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Broadband Access Aggregation and DSL Command Reference</i>
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>

### Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

### MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:  <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFCs	Title
RFC 2661	<i>Layer 2 Tunneling Protocol "L2TP"</i>

**Technical Assistance**

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></p>

## Feature Information for Upstream PPPoX Connection Speed Transfer at LAC

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [http://www.cisco.com/go/featurenavigator](#). An account on Cisco.com is not required.

**Table 1: Feature Information for Upstream PPPoX Connection Speed Transfer at LAC**

Feature Name	Releases	Feature Information
Upstream PPPoX Connection Speed Transfer at LAC	12.2(15)B 12.2(4)T 12.2(33)SRE	<p>The Upstream PPPoX Connection Speed Transfer at LAC feature allows the transfer of the upstream PPPoX session speed value at the LAC.</p> <p>The following command was introduced: <b>rx-speed</b>.</p>