PPPoE on ATM

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The PPPoE on ATM feature provides the ability to connect a network of hosts over a simple bridging-access device to a remote access concentrator. With this model, each host utilizes its own PPPoE stack and the user is presented with a familiar user interface. Access control, billing, and type of service can be done on a per-user, rather than a per-site, basis. Before a point-to-point connection over Ethernet can be provided, each Point-to-Point (PPP) session must learn the Ethernet address of the remote peer and establish a unique session identifier. A unique session identifier is provided by the PPP over Ethernet (PPPoE) Discovery Stage protocol.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see 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 for PPPoE on ATM" section on page 9.

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

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Prerequisites for PPPoE on ATM

Before you can configure PPPoE on ATM, you need to configure the physical interface that will carry the PPPoE session in the broadband access (BBA) groups and specify a virtual template for PPPoE sessions.

Restrictions for PPPoE on ATM

The following restrictions apply when the PPPoE on ATM feature is used:

- Bridging is supported on the ATM permanent virtual circuits (PVCs) running PPPoE.
- PPPoE will be supported on ATM PVCs compliant with RFC 1483 only.
- Only dial-in mode will be supported. Dial-out mode will not be supported.
- Two thousand simultaneous PPP sessions are supported on the Cisco series 7200 with ATM Deluxe port adapters and on the Cisco series 6400 platforms only, both with 128 MB of DRAM.

Information About PPPoE on ATM

To configure PPPoE on ATM, you should understand the following concept:

- Benefits of Using PPPoE on ATM, page 2

Benefits of Using PPPoE on ATM

The PPPoE on ATM feature provides service-provider digital subscriber line (DSL) support. As service providers begin DSL deployments, two of their most significant goals are to ease and facilitate consumer end adoption and to preserve as much of the dialup model as possible. PPPoE serves to advance both of these goals by leveraging Ethernet scale curves and embedded base (such as ATM NICs) and by preserving the point-to-point session used by Internet service providers (ISPs) in today's dialup model.

Using a PPPoE client (available from RouterWare), a PPP session can be initiated on an Ethernet connected client through a standard ADSL modem. The session is transported over the ATM DSL link via RFC 1483 Ethernet bridged frames and can terminate either in the LAN emulation client (LEC) central office or the ISP point of presence (POP). The termination device can be an aggregation box such as the Cisco 6400 or a router such as the Cisco 7200 series platforms.

As customers deploy asymmetric DSL (ADSL), they will encounter the need to enable users to access remote-access concentrators via simple bridges connecting Ethernet and ATM networks.

How to Enable and Configure PPPoE on ATM

This section contains the following procedures:

- Configuring the BBA Group, page 3 (required)
- Creating and Configuring a Virtual Template, page 3 (optional)
- Enabling PPPoE on an ATM PVC, page 5
- Enabling PPPoE on an ATM PVC Range, page 6

Configuring the BBA Group

Perform this task to configure the physical interface that will carry the PPPoE session in the BBA groups and link it to the appropriate virtual template interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe** {*group-name* | **global**}
4. **virtual-template** *template-number*
5. **end**

DETAILED STEPS

	Command	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**bba-group pppoe** {*group-name* | **global**} **Example:** `Router(config)# bba-group pppoe server-selection`	Defines a PPP over Ethernet (PPPoE) profile, and enters VPDN access interface mode. • The **global** keyword creates a profile, which serves as the default profile for any PPPoE port that is not assigned a specific profile.
Step 4	**virtual template** *template-number* **Example:** `(config-bba-group)# virtual-template 20`	Specifies the virtual templatenumber for the BBA group, and places the router in configuration BBA group mode.
Step 5	**end** **Example:** `(config-bba-group)# end`	(Optional) exits the BBA configuration group mode.

Creating and Configuring a Virtual Template

Perform this task to create and configure a virtual template.

Please note that other optional configuration commands can be added to the virtual template configuration. For example, you can enable the PPP authentication on the virtual template using the **ppp authentication chap** command. See the "Virtual Interface Template Service" chapter in the *Cisco IOS Dial Solutions Configuration Guide* for more information about configuring the virtual template.

Although Cisco Express Forwarding switching is supported, flow, and optimum switching are not; these configurations are ignored on the PPPoE virtual access interface. Cisco Express Forwarding is enabled by default for IP. All other protocol traffic will be processed switched.

Note The PPP reliable link that uses Link Access Procedure, Balanced (LAPB) is not supported.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface virtual-template** *number* [**type** [**ethernet | serial | tunnel**]]
4. **ip unnumbered ethernet** *number*
5. **mtu** *bytes*
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**Interface virtual-template** *number* [**type** [**ethernet** | **serial** | **tunnel**]] **Example:** `Router(config)# interface virtual-template 1`	Creates a virtual template interface and enters interface configuration mode.
Step 4	**ip unnumbered ethernet** *number* **Example:** `Router(config-if)# ip unnumbered ethernet 3/1`	Enables IP without assigning a specific IP address on the LAN.
Step 5	**mtu** *bytes* **Example:** `Router(config-if)# mtu bytes`	(Optional) Sets the maximum MTU size for the interface. • Valid range for the MTU size is 1492 or 1500.
Step 6	**end** **Example:** `Router(config-if)# end`	Exits interface configuration mode.

Enabling PPPoE on an ATM PVC

Perform this task to enable PPPoE on an ATM PVC:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *number.subinterface-number* {**multipoint** | **point-to-point**}
4. **pvc** [*name*] *vpi/vci*
5. **encapsulation aal5snap** [**bridge**]
6. **protocol pppoe** [**group** *group-name*]
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface atm** *number.subinterface-number* {**multipoint** | **point-to-point**} **Example:** `Router(config)# interface atm 2/0.1 multipoint`	Configures an ATM multipoint subinterface and enters subinterface configuration mode.
Step 4	**pvc** [*name*] *vpi/vci* **Example:** `Router(config-subif)# pvc name1 0/60`	Configures a VC and enters ATM PVC configuration mode.
Step 5	**encapsulation aal5snap** **Example:** `Router(config-if-atm-vc)# encapsulation aal5snap bridge`	Specifies AAL5 SNAP for ATM encapsulation on the PVC.

	Command or Action	Purpose

Step 6	**protocol pppoe** [**group** *group-name*]
	or
	encapsulation aal5autoppp virtual-template *number* [**group** *group-name*]
	
	Example:
	`Router(config-if-atm-vc)# protocol pppoe group one`
	or
	`Router(config-if-atm-vc)# encapsulation aal5autoppp virtual-template 1 group one`
		Enables PPPoE sessions to be established on the ATMs.
		or
		Configures PPPoA/PPPoE autosense on the MUX- and SNAP-encapsulated ATM PVCs.
		Note If a PPPoE profile is not assigned to the PVC by using the **group** *group-name* option, the PVC will use the global PPPoE profile.

Step 7	**end** **Example:** `Router(config-if-atm-vc)# end`	Exits ATM PVC configuration mode.

Enabling PPPoE on an ATM PVC Range

Perform this task to enable PPPoE on an ATM PVC range.

1. **enable**
2. **configure terminal**
3. **interface atm** *number* [*.subinterface-number* {**multipoint** | **point-to-point**}]
4. **range** [*range-name*] **pvc** [*start-vpi*/]*start-vci* [*end-vpi*/]*end-vci*
5. **encapsulation aal5snap** [**bridge**]
6. **protocol pppoe** [**group** *group-name*]
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface atm** *number*[*.subinterface-number* {**multipoint**	**point-to-point**}] **Example:** `Router(config)# interface atm 5/0.1 multipoint`	Specifies an ATM interface or subinterface and enters subinterface configuration mode.

	Command or Action	Purpose
Step 4	**range** [*range-name*] **pvc** [*start-vpi*/]*start-vci* [*end-vpi*/]*end-vci* **Example:** `Router(config-subif)# range range-pppoa-1 pvc 100 4/199`	Defines a range of ATM profiles and enters ATM PVC range configuration mode.
Step 5	**encapsulation aal5snap** **Example:** `Router(config-if-atm-vc)# encapsulation aal5snap bridge`	Specifies AAL5 SNAP for ATM encapsulation on the PVC.

Step 6	**protocol pppoe** [**group** *group-name*]
	
	or
	
	encapsulation aal5autoppp virtual-template *number* [**group** *group-name*]
	
	Example:
	`Router(config-if-atm-range)# protocol pppoe group one`
	
	or
	
	`Router(config-if-atm-range)# encapsulation aal5autoppp virtual-template 1 group one`
		Enables PPPoE sessions to be established on a range of ATMs.
		
		or
		
		Configures PPPoA/PPPoE autosense.
		
		Note If a PPPoE profile is not assigned to the range by using the **group** *group-name* option, the ATMs in the range will use the global PPPoE profile.

Step 7	**end** **Example:** `Router(config-if-atm-range-)# end`	(Optional) Exits the configuration mode and returns to privileged EXEC mode.

Additional References

The following sections provide references related to the PPPoE on Ethernet feature.

Related Documents

Related Topic	Document Title
Configuring PPPoE on cable interfaces	• *Point-to-Point Protocol over Ethernet Support on the Cisco CMTS* • *Configuring PPPoE Termination on a uBR7100 CMTS with L2TP Tunneling*
Configuring PPPoE Over IEEE 802.1Q VLANs	*PPPoE Over IEEE 802.1Q VLANs*

Standards

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

MIBs

MIB	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: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 2516	*A Method for Transmitting PPPoE*
RFC 4813	*Multiprotocol Encapsulation over ATM Adaptation Layer 5*

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for PPPoE on ATM

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

Table 1 Feature Information for PPPoE on Ethernet

Feature Name	Releases	Feature Information
PPPoE on Ethernet	12.1(2)T 12.2(11)YT 12.2(11)YV 12.2(8)T 12.2(13)T 12.2(28)SB 12.2(33)SRC	This feature adds support to PPPoE by adding direct connection to actual Ethernet interfaces. PPPoE provides service-provider digital subscriber line (DSL) support. This Ethernet specification can be used by multiple hosts on a shared Ethernet interface to open PPP sessions to multiple destination with one or more bridging modems.