



## PPP over Ethernet Client

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The PPP over Ethernet Client feature provides PPP over Ethernet (PPPoE) client support on routers on customer premises.

### History for the PPP over Ethernet Client Feature

Release	Modification
12.2(2)T	This feature was introduced.
12.2(13)T	PPPoE client functionality was separated from VPDN functionality, resulting in changes to PPPoE client configuration.

### Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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## Restrictions for PPPoE Client

For PPPoE over ATM, one PVC will support only one PPPoE client. Multiple PPPoE clients can run concurrently on different PVCs, but each PPPoE client must use a separate dialer interface and a separate dialer pool.



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For PPPoE over Ethernet, each PPPoE client must use a separate dialer interface and a separate dialer pool.

## Information About PPPoE Client

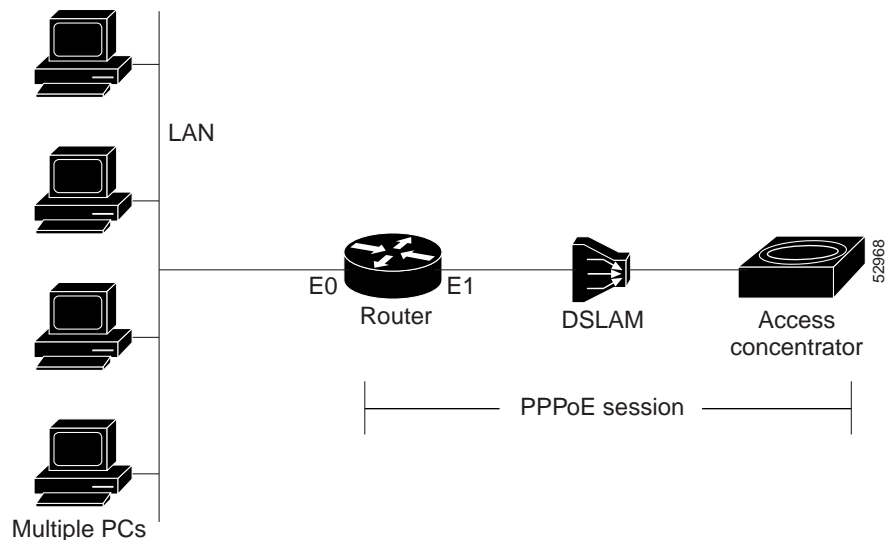
Before you configure a PPPoE client, you should understand the following concepts:

- [PPPoE Client Network Topology, page 2](#)
- [PPPoE Client Support on ATM PVCs and Ethernet Interfaces, page 2](#)
- [PPPoE Client Session Initiation, page 3](#)
- [Benefits of the PPPoE Client Feature, page 3](#)

## PPPoE Client Network Topology

The PPP over Ethernet Client feature provides PPPoE client support on routers on customer premises. Before the introduction of this feature, Cisco IOS software supported PPPoE on the access server side only. Figure 1 shows the typical network topology for PPPoE client deployment.

**Figure 1** Typical Network Topology for PPPoE Deployment



## PPPoE Client Support on ATM PVCs and Ethernet Interfaces

The PPPoE Client feature provides PPPoE client support on ATM permanent virtual circuits (PVCs) and Ethernet interfaces. A dialer interface must be used for cloning virtual access.

One ATM PVC will support one PPPoE client. Multiple PPPoE clients can run concurrently on different PVCs, but each PPPoE client must use a separate dialer interface and a separate dialer pool.

Multiple PPPoE client sessions can be configured on an Ethernet interface, but each session must use a separate dialer interface and a separate dialer pool.

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## PPPoE Client Session Initiation

A PPPoE session is initiated by the PPPoE client. If the session has a timeout or is disconnected, the PPPoE client will immediately attempt to reestablish the session.

The following four steps describe the exchange of packets that occurs when a PPPoE client initiates a PPPoE session:

1. The client broadcasts a PPPoE Active Discovery Initiation (PADI) packet.
2. When the access concentrator receives a PADI that it can serve, it replies by sending a PPPoE Active Discovery Offer (PADO) packet to the client.
3. Because the PADI was broadcast, the host may receive more than one PADO packet. The host looks through the PADO packets it receives and chooses one. The choice can be based on the access concentrator name or on the services offered. The host then sends a single PPPoE Active Discovery Request (PADR) packet to the access concentrator that it has chosen.
4. The access concentrator responds to the PADR by sending a PPPoE Active Discovery Session-confirmation (PADS) packet. At this point a virtual access interface is created that will then negotiate PPP, and the PPPoE session will run on this virtual access.

If a client does not receive a PADO for a preceding PADI, the client sends out a PADI at predetermined intervals. That interval length is doubled for every successive PADI that does not evoke a response, until the interval reaches a configured maximum.

If PPP negotiation fails or the PPP line protocol is brought down for any reason, the PPPoE session and the virtual access will be brought down. When the PPPoE session is brought down, the client waits for a predetermined number of seconds before trying again to establish a PPPoE.

## Benefits of the PPPoE Client Feature

PPPoE is a commonly used application in the deployment of digital subscriber lines (DSL). The PPP over Ethernet Client feature expands PPPoE functionality by providing support for PPPoE on the client as well as on the server.

## How to Configure a PPPoE Client

This section contains the following procedures:

- [Configuring a PPPoE Client in Releases Prior to Cisco IOS Release 12.2\(13\)T, page 3](#)
- [Configuring a PPPoE Client in Cisco IOS Release 12.2\(13\)T and Later Releases, page 10](#)

## Configuring a PPPoE Client in Releases Prior to Cisco IOS Release 12.2(13)T

Perform the following tasks to configure a PPPoE client in releases prior to Cisco IOS release 12.2(13)T:

- [Enabling PPPoE in a VPDN Group, page 4](#)
- [Configuring a PPPoE Client on an ATM PVC, page 5](#)
- [Configuring a PPPoE Client on an Ethernet Interface, page 6](#)
- [Configuring the Dialer Interface, page 7](#)
- [Clearing PPPoE Client Sessions, page 8](#)

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- [Verifying the PPPoE Client, page 9](#)
- [Troubleshooting PPPoE Client Sessions, page 10](#)

## Enabling PPPoE in a VPDN Group

Perform this task to enable PPPoE in a virtual private dial-up network (VPDN) group.

### Restrictions

This task applies only to releases prior to Cisco IOS Release 12.2(13)T.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vpdn enable**
4. **vpdn-group** *name*
5. **request-dialin**
6. **protocol pppoe**

### 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>vpdn enable</b>  <b>Example:</b> Router(config)# vpdn enable	Enables virtual private dialup networking.
Step 4	<b>vpdn-group</b> <i>name</i>  <b>Example:</b> Router(config)# vpdn-group group1	Associates a VPDN group with a customer or VPDN profile.

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	Command or Action	Purpose
Step 5	<code>request-dialin</code>  <b>Example:</b> Router(config-vpdn)# <code>request-dialin</code>	Creates a request-dialin VPDN subgroup.
Step 6	<code>protocol pppoe</code>  <b>Example:</b> Router(config-vpdn-req-in)# <code>protocol pppoe</code>	Enables the VPDN subgroup to establish PPPoE sessions.

## Configuring a PPPoE Client on an ATM PVC

Perform this task to configure a PPPoE client on an ATM PVC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *number*
4. **pvc** [*name*] *vpil/vci*
5. **pppoe-client dial-pool-number** *number*

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> <code>enable</code>	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<code>configure terminal</code>  <b>Example:</b> Router# <code>configure terminal</code>	Enters global configuration mode.
Step 3	<code>interface atm number</code>  <b>Example:</b> Router(config)# <code>interface atm 0</code>	Configures an ATM interface.

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	Command or Action	Purpose
Step 4	<code>pvc [name] vpi/vci</code>  <b>Example:</b> Router(config-if)# pvc 1/100	Creates an ATM PVC.
Step 5	<code>pppoe-client dial-pool-number number</code>  <b>Example:</b> Router(config-if-atm-vc)# pppoe-client dial-pool-number 1	Configures the PPPoE client and specifies the dialer interface to use for cloning on the PVC.

**Note**

If commands are added to the PVC configuration after the PPPoE client session is established, the session is automatically terminated and reestablished.

## Configuring a PPPoE Client on an Ethernet Interface

Perform this task to configure a PPPoE client on an Ethernet interface.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface ethernet** *number*
4. **pppoe-client dial-pool-number** *number*

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <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	<code>configure terminal</code>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.

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	Command or Action	Purpose
Step 3	<code>interface ethernet number</code>  <b>Example:</b> Router(config)# interface ethernet 0	Configures an Ethernet interface.
Step 4	<code>pppoe-client dial-pool-number number</code>  <b>Example:</b> Router(config-if)# pppoe-client dial-pool-number 1	Configures the PPPoE client and specifies the dialer interface to use for cloning.

### Configuring the Dialer Interface

Perform this task to configure the dialer interface to be used for cloning on the PVC.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface dialer number**
4. **mtu bytes**
5. **ip address negotiated**
6. **dialer pool number**
7. **dialer-group group-number**

#### DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <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	<code>configure terminal</code>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<code>interface dialer number</code>  <b>Example:</b> Router(config)# interface dialer 1	Configures a dialer interface.

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	Command or Action	Purpose
Step 4	<b>mtu bytes</b>  <b>Example:</b> Router(config-if) mtu 1492	Adjusts the maximum packet size or maximum transmission unit (MTU) size.  <b>Note</b> It is recommended that you set the MTU to 1492 bytes. This value accommodates a PPPoE header encapsulation of 8 bytes in the Ethernet frame payload
Step 5	<b>ip address negotiated</b>  <b>Example:</b> Router(config-if)# ip address negotiated	Specifies that the IP address for the interface be obtained via PPP/IP Control Protocol (PPP/IPCPC) address negotiation.
Step 6	<b>dialer pool number</b>  <b>Example:</b> Router(config-if)# dialer pool 1	Specifies the dialing pool to use to connect to a specific destination subnetwork.
Step 7	<b>dialer-group group-number</b>  <b>Example:</b> Router(config-if)# dialer-group 1	Configures an interface to belong to a specific dialing group.

## Clearing PPPoE Client Sessions

Perform this task to clear PPPoE client sessions.

### Restrictions

This task applies only to releases prior to Cisco IOS Release 12.2(13)T.

### SUMMARY STEPS

1. **enable**
2. **clear vpdn tunnel pppoe**

### 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>clear vpdn tunnel pppoe</b>  <b>Example:</b> Router# clear vpdn tunnel pppoe	Terminates the PPPoE client session and causes the PPPoE client to try immediately to reestablish the session.

*REVIEW DRAFT—CISCO CONFIDENTIAL***Note**

To permanently terminate a PPPoE client session, use the **no pppoe-client dial-pool-number** command in interface configuration mode or interface-atm-vc configuration mode.

## Verifying the PPPoE Client

Perform this task to verify PPPoE client configuration.

### Prerequisites

This task assumes that the PPPoE client has been configured.

### SUMMARY STEPS

1. **enable**
2. **show vpdn**
3. **show vpdn session packet**
4. **show vpdn session all**
5. **show vpdn tunnel**

### 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>show vpdn</b>  <b>Example:</b> Router# show vpdn	Displays information about active Layer 2 Forwarding (L2F) protocol tunnel and L2F message identifiers in a VPDN.
Step 3	<b>show vpdn session packet</b>  <b>Example:</b> Router# show vpdn session packet	Displays PPPoE session statistics.
Step 4	<b>show vpdn session all</b>  <b>Example:</b> Router# show vpdn session all	Displays PPPoE session information for each session ID.
Step 5	<b>show vpdn tunnel</b>  <b>Example:</b> Router# show vpdn tunnel	Displays PPPoE session count for the tunnel.

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## Troubleshooting PPPoE Client Sessions

Perform this task to troubleshoot the PPPoE client.

### Restrictions

This task applies only to releases prior to Cisco IOS Release 12.2(13)T.

### SUMMARY STEPS

1. **enable**
2. **debug vpdn pppoe-data**
3. **debug vpdn pppoe-errors**
4. **debug vpdn pppoe-events**
5. **debug vpdn pppoe-packets**

### 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>debug vpdn pppoe-data</b>  <b>Example:</b> Router# debug vpdn pppoe-data	Displays PPPoE session data packets.
Step 3	<b>debug vpdn pppoe-errors</b>  <b>Example:</b> Router# debug vpdn pppoe-errors	Displays PPPoE protocol errors that prevent a session from being established or errors that cause an established session to be terminated.
Step 4	<b>debug vpdn pppoe-events</b>  <b>Example:</b> Router# debug vpdn pppoe-events	Displays PPPoE protocol messages about events that are part of normal session establishment or shutdown.
Step 5	Router# <b>debug vpdn pppoe-packets</b>  <b>Example:</b> Router# debug vpdn pppoe-packets	Displays each PPPoE protocol packet exchanged.

## Configuring a PPPoE Client in Cisco IOS Release 12.2(13)T and Later Releases

Perform the following tasks to configure a PPPoE client in Cisco IOS Release 12.2(13)T or later releases:

- [Configuring a PPPoE Client on an ATM PVC, page 11](#)

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- [Configuring a PPPoE Client on an Ethernet Interface, page 12](#)
- [Configuring the Dialer Interface, page 12](#)
- [Clearing PPPoE Client Sessions, page 14](#)
- [Verifying the PPPoE Client, page 14](#)
- [Troubleshooting PPPoE Client Sessions, page 15](#)

## Configuring a PPPoE Client on an ATM PVC

Perform this task to configure a PPPoE client on an ATM PVC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *number*
4. **pvc** [*name*] *vpi/vci*
5. **pppoe-client dial-pool-number** *number*

### 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</b> <i>number</i>  <b>Example:</b> Router(config)# interface atm 0	Configures an ATM interface.
Step 4	<b>pvc</b> [ <i>name</i> ] <i>vpi/vci</i>  <b>Example:</b> Router(config-if)# pvc 1/100	Creates an ATM PVC.
Step 5	<b>pppoe-client dial-pool-number</b> <i>number</i>  <b>Example:</b> Router(config-if-atm-vc)# pppoe-client dial-pool-number 1	Configures the PPPoE client and specifies the dialer interface to use for cloning on the PVC.

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**Note**

If commands are added to the PVC configuration after the PPPoE client session is established, the session is automatically terminated and reestablished.

## Configuring a PPPoE Client on an Ethernet Interface

Perform this task to configure a PPPoE client on an Ethernet interface.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface ethernet** *number*
4. **pppoe-client dial-pool-number** *number*

### 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 ethernet</b> <i>number</i>  <b>Example:</b> Router(config)# interface ethernet 0	Configures an Ethernet interface.
Step 4	<b>pppoe-client dial-pool-number</b> <i>number</i>  <b>Example:</b> Router(config-if)# pppoe-client dial-pool-number 1	Configures the PPPoE client and specifies the dialer interface to use for cloning.

## Configuring the Dialer Interface

Perform this task to configure the dialer interface to be used for cloning on the PVC.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface dialer** *number*

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4. **mtu bytes**
5. **ip address negotiated**
6. **dialer pool number**
7. **dialer-group group-number**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <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	<code>configure terminal</code>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<code>interface dialer number</code>  <b>Example:</b> Router(config)# interface dialer 1	Configures a dialer interface.
Step 4	<code>mtu bytes</code>  <b>Example:</b> Router(config-if) mtu 1492	Adjusts the maximum packet size or maximum transmission unit (MTU) size.  <b>Note</b> It is recommended that you set the MTU to 1492 bytes. This value accommodates a PPPoE header encapsulation of 8 bytes in the Ethernet frame payload
Step 5	<code>ip address negotiated</code>  <b>Example:</b> Router(config-if)# ip address negotiated	Specifies that the IP address for the interface is obtained via PPP/IPCP address negotiation.
Step 6	<code>dialer pool number</code>  <b>Example:</b> Router(config-if)# dialer pool 1	Specifies the dialing pool to use to connect to a specific destination subnetwork.
Step 7	<code>dialer-group group-number</code>  <b>Example:</b> Router(config-if)# dialer-group 1	Configures an interface to belong to a specific dialing group.

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## Clearing PPPoE Client Sessions

Perform this task to clear PPPoE client sessions.

### Restrictions

This task applies only to Cisco IOS release 12.2(13)T and later releases.

### SUMMARY STEPS

1. **enable**
2. **clear pppoe** {**interface** *type number* [**vc** {[*vpi*]/*vci* | *vc-name*]} | **rmac** *mac-address* | **all**}

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <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	<code>clear pppoe</code> { <b>interface</b> <i>type number</i> [ <b>vc</b> {[ <i>vpi</i> ]/ <i>vci</i>   <i>vc-name</i> ]}   <b>rmac</b> <i>mac-address</i>   <b>all</b> }  <b>Example:</b> Router# clear pppoe all	Clears the PPPoE client session and causes the PPPoE client to try immediately to reestablish the session.



#### Note

To permanently terminate a PPPoE client session, use the **no pppoe-client dial-pool-number** command in interface configuration mode or interface-atm-vc configuration mode.

## Verifying the PPPoE Client

Perform this task to verify PPPoE client configuration.

### Prerequisites

This task assumes that the PPPoE client has been configured.

### Restrictions

This task applies only to Cisco IOS release 12.2(13)T and later releases.

### SUMMARY STEPS

1. **enable**
2. **show pppoe session** [**all** | **packets**]

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## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<code>show pppoe session [all   packets]</code>  <b>Example:</b> Router# show pppoe session	Displays information about currently active PPPoE sessions.

## Troubleshooting PPPoE Client Sessions

Perform this task to troubleshoot the PPPoE client.

## Prerequisites

This task applies only to Cisco IOS Release 12.2(13)T and later releases.

## SUMMARY STEPS

1. `enable`
2. `debug pppoe {data | errors | events | packets}`

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<code>debug pppoe {data   errors   events   packets}</code>  <b>Example:</b> Router# debug pppoe errors	Displays debugging information for PPPoE sessions.

## Configuration Examples for PPPoE Client

This section contains the following examples:

- [PPPoE Client in Releases Prior to Cisco IOS Release 12.2\(13\)T: Examples, page 16](#)
- [PPPoE Client in Cisco IOS Release 12.2\(13\)T and Later Releases: Example, page 16](#)

*REVIEW DRAFT—CISCO CONFIDENTIAL***PPPoE Client in Releases Prior to Cisco IOS Release 12.2(13)T: Examples**

In the following example, a PPPoE client is configured on a PVC on ATM interface 0. The PPPoE client will use dialer interface 1 as its virtual access interface.

```

vpdn enable
vpdn-group 1
  request-dialin
  protocol pppoe
!
interface atm0
  pvc 1/100
    pppoe-client dial-pool-number 1
!
interface dialer 1
  ip address negotiated
  dialer pool 1
  dialer-group 1
!

```

In the following example, two PPPoE client sessions are configured on an Ethernet interface. Each PPPoE client will use a separate dialer interface and a separate dialer pool.

```

vpdn enable
vpdn-group 1
  request-dialin
  protocol pppoe
!
interface ethernet1/1
  pppoe-client dial-pool-number 1
  pppoe-client dial-pool-number 2
!
interface dialer 1
  ip address negotiated
  dialer pool 1
  dialer-group 1
!
interface dialer 2
  ip address negotiated
  dialer pool 2
  dialer-group 2
!

```

**PPPoE Client in Cisco IOS Release 12.2(13)T and Later Releases: Example**

The following example shows how to configure a PPPoE client on an Ethernet interface. Note that in Releases 12.2(13)T and later it is not necessary to configure a global VPDN group before configuring the PPPoE client.

```

interface Ethernet 0
  pppoe-client dial-pool-number 1

interface Dialer 1
  ip address negotiated
  dialer pool 1
  mtu 1492

```

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## Additional References

The following sections provide references related to PPPoE client configuration.

### Related Documents

Related Topic	Document Title
VPDN configuration	<i>Cisco IOS Dial Technologies Configuration Guide</i> , Release 12.2
VPDN commands	<i>Cisco IOS Dial Technologies Command Reference</i> , Release 12.2
PPPoE configuration	<i>Cisco IOS Wide-Area Networking Configuration Guide</i> , Release 12.2
PPPoE commands	<i>Cisco IOS Wide-Area Networking Command Reference</i> , Release 12.2

### Standards

Standard	Title
No new or modified standards are supported by this feature.	—

### MIBs

MIB	MIBs Link
No new or modified MIBs are supported 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

RFC	Title
RFC 2516	<i>A Method for Transmitting PPP over Ethernet (PPPoE)</i>

### Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>

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## Command Reference

This section documents new and modified commands only. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- **clear vpdn tunnel**
- **pppoe-client dial-pool-number**

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# clear vpdn tunnel

To shut down a specified virtual private dial-up network (VPDN) tunnel and all sessions within the tunnel, use the **clear vpdn tunnel** command in privileged EXEC mode.

**L2TP or PPTP Tunnels**

```
clear vpdn tunnel {pptp | l2tp} {all | hostname remote-name [local-name] | id local-id | ip
local-ip-address | ip remote-ip-address}
```

**L2F Tunnels**

```
clear vpdn tunnel l2f {all | hostname nas-name hgw-name | id local-id | ip local-ip-address | ip
remote-ip-address}
```

Syntax	Description
<b>pptp</b>	Clears the specified Point-to-Point Tunneling Protocol (PPTP) tunnel.
<b>l2tp</b>	Clears the specified Layer 2 Tunneling Protocol (L2TP) tunnel.
<b>all</b>	Clears all VPDN tunnels terminating on the device.
<b>hostname</b> <i>remote-name</i> [ <i>local-name</i> ]	Clears all L2TP or PPTP VPDN tunnels established between the devices with the specified local and remote hostnames.
<b>id</b> <i>local-id</i>	Clears the VPDN tunnel with the specified local ID.
<b>ip</b> <i>local-ip-address</i>	Clears all VPDN tunnels terminating on the device with the specified local IP address.
<b>ip</b> <i>remote-ip-address</i>	Clears all VPDN tunnels terminating on the device with the specified remote IP address.
<b>l2f</b>	Clears the specified Layer 2 Forwarding (L2F) tunnel.
<b>hostname</b> <i>nas-name</i> <i>hgw-name</i>	Clears all L2F VPDN tunnels established between the network access server (NAS) and home gateway with the specified hostnames.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	11.2	This command was introduced.
	11.3(5)AA	The <b>l2tp</b> keyword was added.
	12.0(1)T	The <b>l2f</b> keyword was added.
	12.0(5)XE5	The <b>pptp</b> keyword was added.

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Release	Modification
12.1(5)T	The <b>pptp</b> keyword was updated for additional Cisco access servers or routers.
12.2(2)T	The syntax for this command was modified to include the following keywords and arguments: <ul style="list-style-type: none"> <li>• <b>all</b></li> <li>• <b>hostname</b> <i>remote-name local-name</i></li> <li>• <b>hostname</b> <i>nas-name hgw-name</i></li> <li>• <b>id</b> <i>local-id</i></li> <li>• <b>ip</b> <i>local-ip-address</i></li> <li>• <b>ip</b> <i>remote-ip-address</i></li> </ul>

**Usage Guidelines**

Manual termination of a VPDN tunnel results in the immediate shutdown of the specified VPDN tunnel and all sessions within that tunnel, resulting in a sudden disruption of VPDN services.

You can shut down VPDN tunnels more gradually by issuing the **vpdn softshut** command, which prevents the establishment of new VPDN sessions in all VPDN tunnels that terminate on the device. Existing VPDN sessions are not affected.

A manually terminated VPDN tunnel can be restarted immediately when a user logs in. Manually terminating and restarting a VPDN tunnel while VPDN event logging is enabled can provide useful troubleshooting information about VPDN session establishment. VPDN event logging is enabled by issuing the **vpdn logging** command.

**Examples**

The following example clears all L2TP tunnels connecting to a remote peer named NAS1:

```
Router# clear vpdn tunnel l2tp hostname NAS1
```

The following example clears all PPTP tunnels connecting the devices with the hostnames NAS3 and tun1:

```
Router# clear vpdn tunnel pptp NAS3 hostname tun1
```

The following example clears all L2F tunnels originating from the specified IP address:

```
Router# clear vpdn tunnel l2f ip 10.1.1.1
```

**Related Commands**

Command	Description
<b>vpdn logging</b>	Enables the logging of generic VPDN events.
<b>vpdn softshut</b>	Prevents new sessions from being established on a VPDN tunnel without disturbing existing sessions.

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# pppoe-client dial-pool-number

To configure a PPP over Ethernet (PPPoE) client and to specify dial-on-demand routing (DDR) functionality, use the **pppoe-client dial-pool-number** command in either interface configuration mode or ATM virtual circuit configuration mode. To disable any configured functionality, use the **no** form of this command.

**pppoe-client dial-pool-number** *number* [**dial-on-demand**]

**no pppoe-client dial-pool-number** *number* [**dial-on-demand**]

Syntax Description	
<i>number</i>	Unique number of a dial group configured with the <b>dialer-group</b> dialer interface command.
<b>dial-on-demand</b>	(Optional) Enables DDR functionality for the PPPoE connection.

**Defaults** A PPPoE client is not configured, and DDR functionality is disabled.

**Command Modes** Interface configuration  
ATM virtual circuit configuration

Command History	Release	Modification
	12.1(3)XG	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
	12.2(13)T	The <b>dial-on-demand</b> keyword was added to allow the configuration of DDR interesting traffic control list functionality.

**Usage Guidelines** One permanent virtual circuit (PVC) will support only one PPPoE client. Multiple PPPoE clients can run concurrently on different permanent virtual circuits (PVCs), but each PPPoE client must use a separate dialer interface and a separate dialer pool.

Use this command to configure dial-on-demand routing (DDR) interesting traffic control list functionality of the dialer interface with a PPP over Ethernet (PPPoE) client. When the DDR functionality is configured for this command, the following DDR commands must also be configured: **dialer-group**, **dialer hold-queue**, **dialer idle-timeout**, and **dialer-list**.

**Tips for Configuring the Dialer Interface**

If you are configuring a hard-coded IP address under the dialer interface, you can configure a default IP route using the **ip route** command as follows:

```
ip route 0.0.0.0 0.0.0.0 dialer1
```

But if you are configuring a negotiated IP address using the **ip address negotiated** command under the dialer interface, you must configure a default IP route using the **ip route** command as follows:

```
ip route 0.0.0.0 0.0.0.0 dialer1 permanent
```

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The reason is that the dialer interface will lose its IP address when a PPPoE session is brought down (even if the dialer does not go down), and hence the route removal routine will take effect and remove all IP routes pointed at the dialer interface, even the default IP route. Although the default IP route will be added back about one minute later by IP background processes, you may risk losing incoming packets during the interval.

**Examples****PPPoE Client DDR Idle-Timer on an Ethernet Interface**

The following example shows how to configure the PPPoE client DDR idle-timer on an Ethernet interface and includes the required DDR commands:

```
!
vpdn enable
no vpdn logging
!
vpdn-group 1
 request-dialin
  protocol pppoe
!
interface Ethernet1
 pppoe enable
 pppoe-client dial-pool-number 1 dial-on-demand
!
interface Dialer1
 ip address negotiated
 ip mtu 1492
 encapsulation ppp
 dialer pool 1
 dialer idle-timeout 180 either
 dialer hold-queue 100
 dialer-group 1
!
dialer-list 1 protocol ip permit
!
ip route 0.0.0.0 0.0.0.0 Dialer1
```

**PPPoE client DDR Idle-Timer on an ATM PVC**

The following example shows how to configure the PPPoE client DDR idle-timer on an ATM PVC interface and includes the required DDR commands:

```
!
vpdn enable
no vpdn logging
!
vpdn-group 1
 request-dialin
  protocol pppoe
!
interface ATM2/0
 pvc 2/100
  pppoe-client dial-pool-number 1 dial-on-demand
!
interface Dialer1
 ip address negotiated
 ip mtu 1492
 encapsulation ppp
 dialer pool 1
 dialer idle-timeout 180 either
 dialer hold-queue 100
 dialer-group 1
!
```

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```
dialer-list 1 protocol ip permit
!
ip route 0.0.0.0 0.0.0.0 Dialer1
```

**Related Commands**

Command	Description
<b>debug vpdn pppoe-data</b>	Displays PPPoE session data packets.
<b>debug vpdn pppoe-errors</b>	Displays PPPoE protocol errors that prevent a session from being established or errors that cause an established session to be terminated.
<b>debug vpdn pppoe-events</b>	Displays PPPoE protocol messages about events that are part of normal session establishment or shutdown.
<b>debug vpdn pppoe-packets</b>	Displays each PPPoE protocol packet exchanged.
<b>dialer-group</b>	Controls access by configuring a virtual access interface to belong to a specific dialing group.
<b>dialer hold-queue</b>	Allows interesting outgoing packets to be queued until a modem connection is established.
<b>dialer idle-timeout</b>	Specifies the idle time before the line is disconnected.
<b>dialer-list</b>	Defines a DDR dialer list to control dialing by protocol or by a combination of protocol and an access list.

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