SNMP traps for PPPoE Session Limits

Last Updated: April 18, 2012

The SNMP Traps for PPPoE Session Limits feature provides SNMP MIB support for PPPoE session limits and generates notifications if those limits are reached.

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 Table at the end of this document.

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. An account on Cisco.com is not required.

Prerequisites for SNMP Traps for PPPoE Session Limits

- PPPoE sessions must be established for this feature to work.

Restrictions for SNMP Traps for PPPoE Session Limits

- The **snmp-server enable traps pppoe** command only enables SNMP traps. It does not support inform requests.

Americas Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

Information About SNMP Traps for PPPoE Session Limits

Benefits of Monitoring PPPoE Sessions with SNMP

The monitoring of PPPoE sessions with SNMP provides the following benefits:

- It helps manage the number of PPPoE sessions configured on a router or PVC by sending notification messages when the PPPoE session threshold has been reached.
- It provides a way of tracking PPPoE session information over time.

Network Management Protocol

SNMP is a network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices and to manage configurations, statistics collection, performance, and security. SNMP version 2 supports centralized and distributed network management strategies and includes improvements in the Structure of Management Information (SMI), protocol operations, management architecture, and security.

How to Configure SNMP Traps for PPPoE Session Limits

Configuring the PPPoE Session-Count Threshold for the Router

Perform this task to configure the PPPoE session-count threshold for the router.

Note The **sessions max limit** command is available only if you configure the **bba-group pppoe** command using the **global** keyword.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps pppoe**
4. **bba-group pppoe** {*group-name* | **global**}
5. **sessions max limit** *session-number* [**threshold** *threshold-value*]
6. **virtual-template** *template-number*
7. **end**
8. **more system:running-config**

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	**snmp-server enable traps pppoe** **Example:** `Router(config)# snmp-server enable traps pppoe`	(Optional) Enables PPPoE session count SNMP notifications. • This command enables SNMP traps that send notification messages when PPPoE sessions have been reached.
Step 4	**bba-group pppoe** {*group-name* | **global**} **Example:** `Router(config)# bba-group pppoe global`	Configures a BBA group to be used to establish PPPoE sessions and enters BBA group configuration mode.
Step 5	**sessions max limit** *session-number* [**threshold** *threshold-value*] **Example:** `Router(config-bba-group)# sessions max limit 4000 threshold 3000`	Configures the PPPoE global profile with the maximum number of PPPoE sessions permitted on a router and sets the PPPoE session-count threshold at which an SNMP trap will be generated. **Note** This command applies only to the global profile.

	Command or Action	Purpose
Step 6	**virtual-template** *template-number* **Example:** `Router(config-bba-group)# virtual-template 1`	Specifies the virtual template that will be used to clone the virtual access interfaces (VAI).
Step 7	**end** **Example:** `Router(config-bba-group)# end`	Exits BBA group configuration mode and returns to privileged EXEC mode.
Step 8	**more system:running-config** **Example:** `Router(#) more system:running-config`	Displays the running configuration and the PPPoE session-count thresholds.

Configuring the PPPoE Session-Count Threshold for a PVC

Perform this task to configure the PPPoE session-count threshold for a PVC.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps pppoe**
4. **interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**]
5. **pvc** [*name*] *vpi* / *vci*
6. **pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*]
7. **protocol pppoe**
8. **end**
9. **more system:running-config**

DETAILED STEPS

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

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server enable traps pppoe** **Example:** `Router(config)# snmp-server enable traps pppoe`	(Optional) Enables PPPoE session count SNMP notifications. • This command enables SNMP traps that send notification messages when PPPoE session thresholds have been reached.
Step 4	**interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**] **Example:** `Router(config)# interface atm 0/0/0.3 point-to-point`	Configures the ATM interface and enters subinterface configuration mode.
Step 5	**pvc** [*name*] *vpi* / *vci* **Example:** `Router(config-subif)# pvc 5/120`	Creates an ATM PVC and enters ATM VC configuration mode.
Step 6	**pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*] **Example:** `Router(config-if-atm-vc)# pppoe max-sessions 5 threshold-sessions 3`	Sets the maximum number of PPPoE sessions that will be permitted on an ATM PVC, PVC range, VC class, or VLAN, and sets the PPPoE session-count threshold at which an SNMP trap will be generated.
Step 7	**protocol pppoe** **Example:** `Router(config-if-atm-vc)# protocol pppoe`	Enables PPPoE sessions to be established on ATM PVCs.
Step 8	**end** **Example:** `Router(config-if-atm-vc)# end`	(Optional) Exits ATM VC configuration mode and returns to sub interface mode.

	Command or Action	Purpose
Step 9	**more system:running-config** **Example:** `Router(#) more system:running-config`	Displays the running configuration and the PPPoE session-count thresholds.

Configuring the PPPoE Session-Count Threshold for a VC Class

Perform this task to configure the PPPoE session-count threshold for a VC class.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps pppoe**
4. **vc-class atm** *name*
5. **pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*]
6. **protocol pppoe** [**group** *group-name* | **global**]
7. **end**
8. **more system:running-config**

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	**snmp-server enable traps pppoe** **Example:** `Router(config)# snmp-server enable traps pppoe`	(Optional) Enables PPPoE session count SNMP notifications. • This command enables SNMP traps that send notification messages when PPPoE session thresholds have been reached.

	Command or Action	Purpose
Step 4	**vc-class atm** *name* **Example:** `Router(config)# vc-class atm main`	Creates a VC class for an ATM PVC, or SVC, or ATM interface and enters VC class configuration mode.
Step 5	**pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*] **Example:** `Router(config-vc-class)# pppoe max-sessions 7 threshold-sessions 3`	Sets the maximum number of PPPoE sessions that will be permitted on an ATM PVC, PVC range, VC class, or VLAN, and sets the PPPoE session-count threshold at which an SNMP trap will be generated.
Step 6	**protocol pppoe** [**group** *group-name* | **global**] **Example:** `Router(config-vc-class)# protocol pppoe group one`	Enables PPPoE sessions to be established.
Step 7	**end** **Example:** `Router(config-vc-class)# end`	(Optional) Exits VC class configuration mode and returns to privileged EXEC mode.
Step 8	**more system:running-config** **Example:** `Router(#) more system:running-config`	Displays the running configuration and the PPPoE session-count thresholds.

Configuring the PPPoE Session-Count Threshold for an ATM PVC Range

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps pppoe**
4. **interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**]
5. **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci*
6. **pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*]
7. **protocol pppoe** [**group** *group-name* | **global**]
8. **end**
9. **more system:running-config**

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	**snmp-server enable traps pppoe** **Example:** `Router(config)# snmp-server enable traps pppoe`	(Optional) Enables PPPoE session count SNMP notifications. • This command enables SNMP traps that send notification messages when PPPoE session thresholds have been reached.
Step 4	**interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**] **Example:** `Router(config)# interface atm 0/0/0.3 point-to-point`	Configures the ATM interface and enters the subinterface configuration mode.
Step 5	**range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* / *end-vci* **Example:** `Router(config-subif)# range pvc 3/100 3/105`	Defines a range of ATM PVCs and enters ATM PVC range configuration mode.
Step 6	**pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*] **Example:** `Router(config-if-atm-range)# pppoe max-sessions 20 threshold-sessions 15`	Sets the maximum number of PPPoE sessions that will be permitted on an ATM PVC, PVC range, VC class, or VLAN, and sets the PPPoE session-count threshold at which an SNMP trap will be generated.

	Command or Action	Purpose
Step 7	**protocol pppoe** [**group** *group-name* | **global**] **Example:** `Router(config-if-atm-range)# protocol pppoe group two`	Enables PPPoE sessions to be established.
Step 8	**end** **Example:** `Router(config-if-atm-range)# end`	(Optional) Exits ATM PVC range configuration mode and returns to privileged EXEC mode.
Step 9	**more system:running-config** **Example:** `Router(#) more system:running-config`	Displays the running configuration and the PPPoE session-count thresholds.

Configuring the PPPoE Session-Count Threshold for an Individual PVC Within a Range

Perform this task to configure the PPPoE session-count threshold for an individual PVC within an ATM PVC range.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps pppoe**
4. **interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**]
5. **range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* /end-vci
6. **pvc-in-range** [*pvc-name*] [*vpi* / *vci*]
7. **pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*]
8. **end**
9. **more system:running-config**

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	**snmp-server enable traps pppoe** **Example:** `Router(config)# snmp-server enable traps pppoe`	(Optional) Enables PPPoE session count SNMP notifications. • This command enables SNMP traps that send notification messages when PPPoE session thresholds have been reached.
Step 4	**interface atm** *slot* / *subslot* / *port* [.*subinterface*] [**multipoint** | **point-to-point**] **Example:** `Router(config)# interface atm 6/0.110 multipoint`	Configures the ATM interface and enters subinterface configuration mode.
Step 5	**range** [*range-name*] **pvc** *start-vpi* / *start-vci end-vpi* /end-vci **Example:** `Router(config-subif)# range range1 pvc 3/100 4/199`	Defines a range of ATM PVCs and enters ATM PVC Range configuration mode.
Step 6	**pvc-in-range** [*pvc-name*] [*vpi* / *vci*] **Example:** `Router(config-if-atm-range)# pvc-in-range pvc1 3/104`	Configures an individual PVC within a PVC range and enters ATM PVC-in-range configuration mode.

	Command or Action	Purpose
Step 7	**pppoe max-sessions** *number-of-sessions* [**threshold-sessions** *number-of-sessions*] **Example:** `Router(cfg-if-atm-range-pvc)# pppoe max-sessions 10 threshold-sessions 5`	Sets the maximum number of PPPoE sessions that will be permitted on an ATM PVC, PVC range, VC class, or VLAN, and sets the PPPoE session-count threshold at which an SNMP trap will be generated.
Step 8	**end** **Example:** `Router(cfg-if-atm-range-pvc)# end`	(Optional) Exits ATM PVC-in-range configuration mode and returns to privileged EXEC mode.
Step 9	**more system:running-config** **Example:** `Router(#) more system:running-config`	Displays the running configuration and the PPPoE session-count thresholds.

Monitoring and Maintaining PPPoE Session Counts and SNMP Notifications

Perform the following task to monitor PPPoE sessions counts and SNMP notifications.

SUMMARY STEPS

1. **enable**
2. **debug snmp packets**
3. **debug pppoe errors** [**rmac** *remote-mac-address* | **interface** *type number* [**vc** {[*vpi* /]*vci* | *vc-name*}] [**vlan** *vlan-id*]]
4. **debug pppoe** events [**rmac** *remote-mac-address* | **interface** *type number* [**vc** {[*vpi* /]*vci* | *vc-name*}] [**vlan** *vlan-id*]]
5. **show vpdn session**
6. **show pppoe session**

DETAILED STEPS

Step 1 **enable**

Use this command to enable privileged EXEC mode. Enter your password when prompted.

Example:

```
Router> enable
```

Step 2 **debug snmp packets**

Use this command to display information about every SNMP packet sent or received by the router:

Example:

```
Router# debug snmp packets
SNMP: Packet received via UDP from 192.0.2.11 on GigabitEthernet1/0
SNMP: Get-next request, reqid 23584, errstat 0, erridx 0
 sysUpTime = NULL TYPE/VALUE
 system.1 = NULL TYPE/VALUE
 system.6 = NULL TYPE/VALUE
SNMP: Response, reqid 23584, errstat 0, erridx 0
 sysUpTime.0 = 2217027
 system.1.0 = Cisco Internetwork Operating System Software
 system.6.0 =
SNMP: Packet sent via UDP to 192.0.2.11
```

Step 3 **debug pppoe errors** [**rmac** *remote-mac-address* | **interface** *type number* [**vc** {[*vpi* /]*vci* | *vc-name*}] [**vlan** *vlan-id*]]

Use this command to display PPPoE protocol errors that prevent a session from being established or errors that cause an established session to be closed.

Example:

```
Router# debug pppoe errors interface atm 1/0.10
PPPoE protocol errors debugging is on
Router#
00:44:30:PPPoE 0:Max session count(1) on mac(00b0.c2e9.c470) reached.
00:44:30:PPPoE 0:Over limit or Resource low. R:00b0.c2e9.c470 L:ffff.ffff.ffff 0/101
ATM1/0.10
```

Step 4 **debug pppoe** events [**rmac** *remote-mac-address* | **interface** *type number* [**vc** {[*vpi* /]*vci* | *vc-name*}] [**vlan** *vlan-id*]]

Use this command to display PPPoE protocol messages about events that are part of normal session establishment or shutdown:

Example:

```
Router# debug pppoe events interface atm 1/0.10 vc 101

PPPoE protocol events debugging is on
Router#
00:41:55:PPPoE 0:I PADI  R:00b0.c2e9.c470 L:ffff.ffff.ffff 0/101 ATM1/0.10
00:41:55:PPPoE 0:O PADO, R:00b0.c2e9.c470 L:0001.c9f0.0c1c 0/101 ATM1/0.10
00:41:55:PPPoE 0:I PADR  R:00b0.c2e9.c470 L:0001.c9f0.0c1c 0/101 ATM1/0.10
00:41:55:PPPoE :encap string prepared
00:41:55:[3]PPPoE 3:Access IE handle allocated
00:41:55:[3]PPPoE 3:pppoe SSS switch updated
00:41:55:[3]PPPoE 3:AAA unique ID allocated
00:41:55:[3]PPPoE 3:No AAA accounting method list
00:41:55:[3]PPPoE 3:Service request sent to SSS
00:41:55:[3]PPPoE 3:Created  R:0001.c9f0.0c1c L:00b0.c2e9.c470 0/101 ATM1/0.10
00:41:55:[3]PPPoE 3:State REQ_NASPORT    Event MORE_KEYS
00:41:55:[3]PPPoE 3:O PADS  R:00b0.c2e9.c470 L:0001.c9f0.0c1c 0/101 ATM1/0.10
00:41:55:[3]PPPoE 3:State START_PPP    Event DYN_BIND
00:41:55:[3]PPPoE 3:data path set to PPP
00:41:57:[3]PPPoE 3:State LCP_NEGO    Event PPP_LOCAL
00:41:57:PPPoE 3/SB:Sent vtemplate request on base Vi2
00:41:57:[3]PPPoE 3:State CREATE_VA    Event VA_RESP
00:41:57:[3]PPPoE 3:Vi2.1 interface obtained
00:41:57:[3]PPPoE 3:State PTA_BIND    Event STAT_BIND
00:41:57:[3]PPPoE 3:data path set to Virtual Access
00:41:57:[3]PPPoE 3:Connected PTA
```

Step 5 **show vpdn session**

Use this command to display information about active Level 2 Forwarding (L2F) protocol tunnel and message identifiers on a VPDN:

Example:

```
Router# show vpdn session
%No active L2TP tunnels
%No active L2F tunnels
PPPoE Session Information Total tunnels 1 sessions 1
PPPoE Session Information
SID        RemMAC          LocMAC       Intf    VASt    OIntf    VC
1       0010.7b01.2cd9  0090.ab13.bca8  Vi4     UP      AT6/0   0/10
```

Step 6 **show pppoe session**

Use this command to display information about the currently active PPPoE sessions:

Example:

```
Router# show pppoe session
     3 sessions in LOCALLY_TERMINATED (PTA) State
     3 sessions total

Uniq ID  PPPoE  RemMAC          Port            VT  VA         State
           SID  LocMAC                              VA-st      Type
      1      1  0007.b3dc.a41c  ATM0/3/1.100     1  Vi2.1      PTA
                001a.3045.0331  VC: 99/100          UP
      2      2  0007.b3dc.a41c  ATM0/3/1.100     1  Vi2.2      PTA
                001a.3045.0331  VC: 99/100          UP
      3      3  0007.b3dc.a41c  ATM0/3/1.100     1  Vi2.3      PTA
                001a.3045.0331  VC: 99/100          UP
Router#
```

Configuration Examples for SNMP Traps for PPPoE Session Limits

Example: Configuring PPPoE Session-Count SNMP Traps

The following example shows how to enable the router to send PPPoE session-count SNMP notifications to the host at the address 192.10.2.10:

```
snmp-server community public RW
```

```
snmp-server enable traps pppoe
snmp-server host 192.10.2.10 version 2c public udp-port 1717
```

Example: Configuring PPPoE Session-Count Threshold for the Router

The following example shows a limit of 4000 PPPoE sessions configured for the router. The PPPoE session-count threshold is set at 3000 sessions, so when the number of PPPoE sessions on the router reaches 3000, an SNMP trap will be generated.

```
bba-group pppoe pppoe1
 sessions max limit 4000 threshold 3000
 virtual-template 1
pppoe limit max-sessions 4000 threshold-sessions 3000
```

Example: Configuring PPPoE Session-Count Threshold for a PVC

The following example shows a limit of five PPPoE sessions configured for the PVC. The PPPoE session-count threshold is set at three sessions, so when the number of PPPoE sessions on the PVC reaches three, an SNMP trap will be generated.

```
interface ATM 0/0/0
 ip address 10.0.0.1 255.255.255.0
 no atm ilmi-keepalive
 pvc 5/120
  protocol ip 10.0.0.2 broadcast
  pppoe max-sessions 5 threshold-sessions 3
  protocol pppoe
```

Example: Configuring PPPoE Session-Count Threshold for a VC Class

The following example shows a limit of seven PPPoE sessions configured for a VC class called "main." The PPPoE session-count threshold is set at three sessions, so when the number of PPPoE sessions for the VC class reaches three, an SNMP trap will be generated.

```
vc-class atm main
  protocol pppoe group global
vc-class atm global
  protocol pppoe
  pppoe max-sessions 7 threshold-sessions 3
```

Example: Configuring PPPoE Session-Count Threshold for a PVC Range

The following example shows a limit of 20 PPPoE sessions configured for the PVC range. The PPPoE session-count threshold will also be 20 sessions because when the session-count threshold has not been explicitly configured, it defaults to the PPPoE session limit. An SNMP trap will be generated when the number of PPPoE sessions for the range reaches 20.

```
interface ATM 0/0/0.3 point-to-point
 range pvc 3/100 3/105
  pppoe max-sessions 20 threshold-sessions 15
  protocol pppoe
```

Example: Configuring PPPoE Session-Count Threshold for an Individual PVC Within a PVC Range

The following example shows a limit of ten PPPoE sessions configured for pvc1. The PPPoE session-count threshold is set at three sessions, so when the number of PPPoE sessions for the PVC reaches three, an SNMP trap will be generated.

```
interface atm 6/0.110 multipoint
 range range1 pvc 100 4/199
  pvc-in-range pvc1 3/104
   pppoe max-sessions 10 threshold-sessions 3
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Broadband Access Aggregation and DSL commands	Cisco IOS Broadband Access Aggregation and DSL Command Reference

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for SNMP Traps for PPPoE Session Limits

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 www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1 Feature Information for SNMP Traps for PPPoE Session Limits

Feature Name	Releases	Feature Information
SNMP Traps for PPPoe Session Limits	Cisco IOS XE Release 2.6 15.1(1)SG	The SNMP Traps for PPPoE Session Limits feature implements SNMP MIB support for PPPoE session limits and generates notifications in case the limits are reached. The following commands were introduced or modified: **snmp-server enable traps pppoe**.