

Configuring PPP over Ethernet Session Limit Support

This module provides information on how to limit the number of PPP over Ethernet (PPPoE) sessions that can be created on a router or on a Gigabit Ethernet interface for configuration.

- Information About Configuring PPP over Ethernet Session Limit Support, on page 1
- How to Configure PPP over Ethernet Session Limit Support, on page 2
- Configuration Examples for PPP over Ethernet Session Limit Support, on page 6
- Additional References, on page 7
- Feature Information for Configuring PPP over Ethernet Session Limit Support, on page 9

Information About Configuring PPP over Ethernet Session Limit Support

Benefits of Configuring PPP over Ethernet Session Limit Support

- The PPPoE Session Limit Support feature prevents the router from using too much memory for virtual access by limiting the number of PPPoE sessions that can be created on a router or on all Ethernet interfaces and subinterfaces as well as ATM interfaces and subinterfaces.
- The SNMP Enhancements for ASR 1000 feature enhances Cisco ASR 1000 Aggregation Series Router to count the PPPoE sessions in PTA, FWDED, and TRANS state for a particular physical interface, and the total number of sessions that exist in a physical interface. Provision for using a system-wide threshold trap and per-physical threshold trap is provided through SNMP. These functionalities enable users to retrieve the total number of sessions and per-interface session-loss threshold value.

Trap Generation

In scenarios where you must deploy ASR 1000 Series Routers with one physical port mapped to one DSLAM and if the total number of sessions for the DSLAM falls below the threshold value on a physical interface, due to a loss of high number of sessions, a notification trap is generated. You can use these traps to investigate the issue and take immediate actions.

When the number of active sessions falls below the threshold value, only one trap is generated. Further traps are not sent even if the number of sessions continue to decrease. The next set of traps are sent only if the number of sessions rise above the configured threshold value and fall. This criterion is applicable to both global and per-interface traps.

When threshold values are configured in both global and per-interface configuration modes, then both the threshold values are monitored separately. Traps are sent when the session count falls below the threshold value either in global configuration mode or in per-interface configuration mode.

How to Configure PPP over Ethernet Session Limit Support

Specifying the Maximum Number of PPPoE Sessions on a Router

Perform this task to specify the maximum number of PPPoE sessions that can be created on a router.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe** {*name* | **global**}
4. **virtual-template** *template-number*
5. **sessions per-mac limit** *per-mac-limit*
6. **sessions per-vlan limit** *per-vlan-limit* [**inner** *vlan-id*]
7. **sessions per-vc limit** *per-vc-limit* [**threshold** *threshold-value*]
8. **sessions max limit** *number-of-sessions* [**threshold** *threshold-value*]
9. **exit**

DETAILED STEPS

Procedure

	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	**bba-group pppoe** {*name*	**global**} **Example:** `Router(config)# bba-group pppoe global`	Configures a broadband aggregation (BBA) group to be used to establish PPPoE sessions and enters BBA group configuration mode.

	Command or Action	Purpose
		• *name* --Name of the BBA group. You can have multiple BBA groups. • **global** -- Specifies the PPPoE profile that serves as the default profile for any PPPoE port (Gigabit Ethernet interface or VLAN) that has not been assigned a specific PPPoE profile.
Step 4	**virtual-template** *template-number* **Example:** `Router(config-bba-group)# virtual-template 1`	Specifies the virtual template that will be used to clone virtual access interfaces for all PPPoE ports that use this PPPoE profile.
Step 5	**sessions per-mac limit** *per-mac-limit* **Example:** `Router(config-bba-group)# sessions per-mac limit 1000`	(Optional) Configures the maximum number of PPPoE sessions allowed per MAC session limit in a PPPoE profile. The default MAC session limit is 100.
Step 6	**sessions per-vlan limit** *per-vlan-limit* [**inner** *vlan-id*] **Example:** `Router(config-bba-group)# session per-vlan limit 4000 inner 3500`	(Optional) Sets the session limit for the inner VLAN on QinQ subinterface. The default session limit is 100. **Note** The per-VLAN limit is only applicable to Gigabit Ethernet subinterfaces (802.1q VLANs).
Step 7	**sessions per-vc limit** *per-vc-limit* [**threshold** *threshold-value*] **Example:** `Router(config-bba-group)# sessions per-vc limit 2000`	(Optional) Sets the maximum number of PPPoE sessions allowed per VC session limit in a PPPoE profile. The default session limit is 100. **Note** The per-VC limit is applicable only to ATM interfaces and subinterfaces.
Step 8	**sessions max limit** *number-of-sessions* [**threshold** *threshold-value*] **Example:** `Router(config-bba-group)# sessions max limit 32000`	Configures the PPPoE global profile with the maximum number of PPPoE sessions that will be permitted on a router, and sets the PPPoE session-count threshold at which a Simple Network Management Protocol (SNMP) trap will be generated. **Note** This command applies only to the global profile.
Step 9	**exit** **Example:** `Router(config-bba-group)# exit`	Returns to global configuration mode.

Specifying the Maximum Number of PPPoE Sessions on a Gigabit Ethernet Interface

Perform this task to specify the maximum number of PPPoE sessions that can be created on a Gigabit Ethernet interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** {**GigabitEthernet** | **tenGigabitEthernet**} *slot* / *subslot* / *port*[**.** *subinterface*]
4. **pppoe enable** [**group** *group-name*]
5. **pppoe max-sessions** *number*
6. **end**

DETAILED STEPS

Procedure

	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** {**GigabitEthernet** | **tenGigabitEthernet**} *slot* / *subslot* / *port*[**.** *subinterface*] **Example:** `Router(config)# interface GigabitEthernet0/0/1`	Specifies a Gigabit Ethernet interface and enters interface configuration mode.
Step 4	**pppoe enable** [**group** *group-name*] **Example:** `Router(config-if)# pppoe enable group one`	Enables PPPoE sessions on a Gigabit Ethernet interface or subinterface. **Note** If a PPPoE profile is not assigned to the interface through the use of the **group** *group-name* option, the interface will use the global PPPoE profile.
Step 5	**pppoe max-sessions** *number* **Example:** `Router(config-if)# pppoe max-sessions 10`	Specifies the maximum number of PPPoE sessions permitted on the interface or subinterface.

	Command or Action	Purpose
Step 6	**end** **Example:** `Router(config-if)# end`	(Optional) Exits interface configuration mode and returns to privileged EXEC mode.

Configuring System-Wide Threshold Parameters

Performthis task to configure the system-wide threshold parameters.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group ppp oe globa** l
4. **sessions threshold** *number*
5. **exit**
6. **interface** type *number*
7. **pppoe-sessions threshold** *number*
8. **end**
9. **show pppoe summary**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode.
Step 2	**configure terminal** **Example:** `Router> configure terminal`	Enters global configuration mode.
Step 3	**bba-group ppp oe globa** l **Example:** `Router(config)# bba-group pppoe global`	Defines a PPPoE profile and enters BBA group configuration mode.
Step 4	**sessions threshold** *number* **Example:**	Configures the global threshold value.

	Command or Action	Purpose
	`Router(config-bba-group)# sessions threshold 1000`	
Step 5	**exit** **Example:** `Router(config-bba-group)# exit`	Exits BBA group configuration mode and returns to privileged EXEC mode.
Step 6	**interface** type *number* **Example:** `Router(config-if)# interface GigabitEthernet 0/0`	Enters interface configuration mode.
Step 7	**pppoe-sessions threshold** *number* **Example:** `Router(config-if)# pppoe-sessions threshold 1000`	Configures per-session threshold value.
Step 8	**end** **Example:** `Router(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode
Step 9	**show pppoe summary** **Example:** `Router# show pppoe summary`	Displays the count of PPPoE sessions in PTA, FWDED, and TRANS state for a particular physical interface.

Configuration Examples for PPP over Ethernet Session Limit Support

Example Specifying the Maximum Number of PPPoE Sessions on a Router

The following example shows how to configure a limit of 1,000 PPPoE sessions for the router:

```
bba-group pppoe global
  virtual-template 1
  sessions per-mac limit 1000
  sessions per-vlan limit 4000 inner 3500
  sessions per-vc limit 2000
```

Example Specifying the Maximum Number of PPPoE Sessions on a Gigabit Ethernet Interface

The following example shows how to configure a limit of ten PPPoE sessions on the Gigabit Ethernet interface:

```
interface GigabitEthernet 1/0/0
  pppoe enable
  pppoe max-sessions 10
```

The following example shows how to configure a limit of ten PPPoE sessions on the Gigabit Ethernet subinterface by using the **encapsulation**command:

```
interface GigabitEthernet 0/0/0.1
  encapsulation dot1q 2
  pppoe enable
  pppoe max-sessions 10
```

Example Configuring the System-wide Threshold Parameters

The following example shows how to configure global and per-session threshold values:

```
Router# configure terminal
Router(config)# bba-group pppoe global
 Router(config-bba-group)# sessions threshold 1000
Router(config-bba-group)# exit
Router# configure terminal


Router(config)# interface GigabitEthernet 0/0


Router(config-if)# pppoe-sessions threshold 90
Router(config-if)# end
```

The following example shows how to use the **show pppoe summary** command to display the count of the PPPoE sessions:

```
Router# show pppoe summary
PTA  : Locally terminated sessions
FWDED: Forwarded sessions
TRANS: All other sessions (in transient state)
TOTAL PTA   FWDED TRANS
TOTAL 1       1       0       0
GigabitEthernet0/3/1 1       1       0       0
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	

Related Topic	Document Title
Broadband and DSL commands	*Cisco IOS Broadband and DSL Command Reference*
Broadband access aggregation of PPPoE sessions	Providing Protocol Support for Broadband Access Aggregation of PPPoE Sessions

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 software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

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

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 Configuring PPP over Ethernet Session Limit Support

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 Providing PPP over Ethernet Session Limit Support

Feature Name	Releases	Feature Information
PPP over Ethernet Session Limit Support	Cisco IOS XE Release 2.1 Cisco IOS XE Release 2.4	This feature was introduced on Cisco ASR 1000 Series Aggregation Services Routers. The PPPoE Session Limit Support feature enables you to limit the number of PPPoE sessions that can be created on a router or on a Gigabit Ethernet interface for configuration. This feature was integrated into Cisco IOS XE Release 2.4.
SNMP Enhancements for ASR 1000	Cisco IOS XE Release 3.2S	The SNMP Enhancements for ASR 1000 feature enhances Cisco ASR 1000 Aggregation Series Routers to provide the count of the PPPOE sessions in PTA, Forwarded, and TRANS state for a particular physical interface, and the total count of sessions that exist in a physical interface. This feature was introduced in Cisco IOS XE 3.2S. The following commands were introduced or modified: **pppoe-sessions threshold**, **sessions threshold**.