

PPP for IPv6

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Information About PPP for IPv6

Accounting Start and Stop Messages

PPP calls a registry to allow DHCPv6 to append the delegated prefix information to accounting start and stop messages. When accounting is configured for a DHCPv6 pool, accounting interim packets are sent to broadband sessions after binding is provided from the pool.

Forced Release of a Binding

The DHCPv6 server maintains an automatic binding table in memory to track the assignment of some configuration parameters, such as prefixes between the server and its clients. The automatic bindings can be stored permanently in the database agent, which can be, for example, a remote TFTP server or local NVRAM file system.

DHCPv6 invokes a routine when the virtual interface used by PPP terminates. This routine automatically releases any delegated prefix bindings associated with the PPP virtual interface that is being terminated.

When a PPP virtual interface terminates, the routine runs through the full table of DHCPv6 bindings checking for the matching interface. Because PPP uses a virtual interface, this subroutine clears any related lease information when the PPP connection terminates.

Note In IPv6 broadband deployment using DHCPv6, you must enable release of prefix bindings associated with a PPP virtual interface using the **ipv6 dhcp binding track ppp** command. This ensures that DHCPv6 bindings are tracked together with PPP sessions, and in the event of DHCP REBIND failure, the client initiates DHCPv6 negotiation again.

Delegated-IPv6-Prefix

The Delegated-IPv6-Prefix attribute calls DHCPv6 to parse and store AAA attribute information. PPP sends the accounting start and stop messages for PPP sessions.

The following is an example of a Delegated-IPv6-Prefix attribute:

cisco-avpair = ipv6:delegated-prefix=2001:DB8::/64

Note The Delegated-IPv6-Prefix attribute does not support the Cisco VSA format. If you try add this attribute in the cisco-vsa format in the profile, the RADIUS server response fails. Use only the IETF attribute for Delegated-IPv6-Prefix.

PPP IPv6 Accounting Delay Enhancements

This feature enhances accounting records for dual-stack networks. It ensures that a unique IPv6 address is assigned to PPP IPv6 and IPv4 sessions for IP addresses that are received from RADIUS.

When this feature is enabled, it automatically creates a database to hold new incoming access-accept responses from RADIUS. The access-accept responses in this database are then checked for duplicates of a specific set of attributes. If the attributes are already present in the database, then the RADIUS server has already offered them to an existing session; therefore, the new session is immediately removed and a stop-record message sent. If none of the specific set of attributes are in the database, they are immediately added to the database, and the session proceeds normally. When the session is removed, the entries in the database are also removed.

The following RADIUS attributes are tracked in the database and checked at access-accept time:

- Framed-IPv6-Prefix
- Delegated-IPv6-Prefix

The attributes are available as standard RFC-defined binary format, or as Cisco VSAs. (The Delegated-IPv6-Prefix attribute currently does not have a VSA definition in AAA.)

How to Configure PPP for IPv6

Enabling the Sending of Accounting Start and Stop Messages

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 dhcp pool** *poolname*
4. **accounting** *mlist*

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ipv6 dhcp pool** *poolname* **Example:** `Device(config)# ipv6 dhcp pool pool1`	Configures a DHCP for IPv6 configuration information pool and enters DHCP for IPv6 pool configuration mode.
Step 4	**accounting** *mlist* **Example:** `Device(config-dhcp)# accounting list1`	Enables accounting start and stop messages to be sent.

Removing Delegated Prefix Bindings

Perform this task to release any delegated prefix bindings associated with the PPP virtual interface that is being terminated.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 dhcp bindings track ppp**

DETAILED STEPS

Procedure

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

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**interface** *type number* **Example:** `Device(config)# interface VirtualAccess2.2`	Specifies an interface type and number, and places the router in interface configuration mode.
Step 4	**ipv6 dhcp bindings track ppp** **Example:** `Device(config-if)# ipv6 dhcp bindings track ppp`	Releases any delegated prefix leases associated with the PPP virtual interface that is being terminated.

Configuring PPP IPv6 Accounting Delay Enhancements

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ppp unique address access-accept**

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	**ppp unique address access-accept** **Example:** `Router(config)# ppp unique address access-accept`	Tracks duplicate addresses received from RADIUS and creates a standalone database.

Configuration Examples for PPP for IPv6

Example: Enabling the Sending of Accounting Start and Stop Messages

This example shows how to enable a device to send accounting start and stop messages.

```
Device(config)# ipv6 dhcp pool pool1
Device(config-dhcp)# accounting list1
```

Additional References

Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	*IPv6 Configuration Guide*
Cisco IOS commands	
IPv6 commands	Cisco IOS IPv6 Command Reference
Cisco IOS IPv6 features	Cisco_IOS_IPv6_Feature_Mapping

Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	

MIBs

MIB	MIBs Link
	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

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 PPP for IPv6

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 PPP for IPv6

Feature Name	Releases	Feature Information
PPP Enhancement for Broadband IPv6	Cisco IOS XE Release 2.5	IPv6 supports this feature. The following commands were introduced or modified: **accounting**, **ipv6 dhcp bindings track ppp**, **ipv6 dhcp pool**.
PPP IPv6 Accounting Delay Enhancements	Cisco IOS XE Release 3.2S	IPv6 supports this feature. The following commands were introduced or modified: **ppp unique address accept-access**.
SSO/ISSU Support for Per-User IPv6 ACL for PPP Sessions	Cisco IOS XE Release 3.2.1S	IPv6 supports this feature. No commands were introduced or modified.