DHCP Option 82 Support for Routed Bridge Encapsulation

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The DHCP Option 82 Support for Routed Bridge Encapsulation feature allows service providers to create a policy on a DHCP server to determine the number of IP addresses (number of bridging users) to be assigned to a particular ATM virtual path identifier/virtual channel identifier (VPI/VCI) port.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and 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 module.

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 DHCP Option 82 Support for Routed Bridge Encapsulation

Configure the DHCP Option 82 Support feature on the DHCP relay agent using the **ip dhcp relay information option** command before configuring the DHCP Option 82 Support for Routed Bridge Encapsulation feature.

Information About DHCP Option 82 Support for Routed Bridge Encapsulation

DHCP Option 82 for Routed Bridge Encapsulation--Overview

The DHCP relay agent information option (option 82) enables a DHCP relay agent to include information about itself when forwarding client-originated DHCP packets to a DHCP server. The DHCP server can use this information to implement IP address or other parameter-assignment policies.

The DHCP Option 82 Support for Routed Bridge Encapsulation feature provides support for the DHCP relay agent information option when ATM routed bridge encapsulation (RBE) is used. The figure below shows a typical network topology in which ATM RBE and DHCP are used. The aggregation router that is using ATM RBE is also serving as the DHCP relay agent.

Figure 1   Network Topology Using ATM RBE and DHCP

The DHCP Option 82 Support for Routed Bridge Encapsulation feature communicates information to the DHCP server using a suboption of the DHCP relay agent information option called agent remote ID. The information sent in the agent remote ID includes an IP address identifying the relay agent and information about the ATM interface and the permanent virtual circuit (PVC) over which the DHCP request came in. The DHCP server can use this information to make IP address assignments and security policy decisions.

The figure below shows the format of the agent remote ID suboption.

Figure 2   Format of the Agent Remote ID Suboption
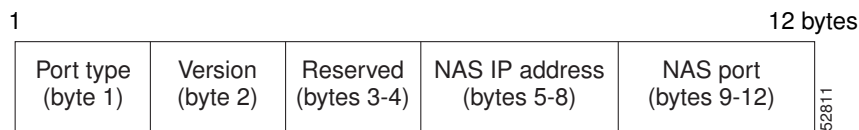
The table below describes the agent remote ID suboption fields displayed in the figure above.

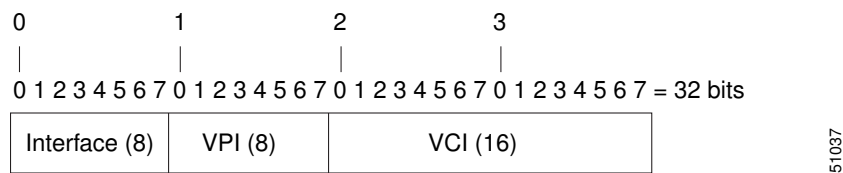Table 1   Agent Remote ID Suboption Field Descriptions

Field	Description
Port type	Port type. The value 0x01 indicates RBE (1 byte).
Version	Option 82 version. The value 0x01 specifies the RBE version of option 82 (1 byte).

| Field	Description
Reserved	Reserved (2 bytes).
NAS IP address	IP address of one of the interfaces on the DHCP relay agent. The **rbe nasip** command can be used to specify which IP address will be used (4 bytes).
NAS port	RBE-enabled virtual circuit on which the DHCP request has come in. See the figure below for the format of this field (4 bytes).

The figure below shows the format of the network access server (NAS) port field in the agent remote ID suboption.

Figure 3   Format of the NAS Port Field

```
0              1              2              3
|              |              |              |
0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 0 1 2 3 4 5 6 7 = 32 bits

| Interface (8) |   VPI (8)   |        VCI (16)        |
```
51037

The figure below shows the format of the interface field. If there is no module, the value of the module bit is 0.

Figure 4   Format of the Interface Field

```
0                                              7 = 8 bits

|    Slot (4)    |  Module (1)  |   Port (3)   |
```
51038
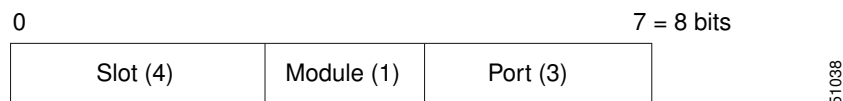
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Benefits

The DHCP Option 82 Support for Routed Bridge Encapsulation feature enables the service providers to use DHCP to assign IP addresses and DHCP option 82 to implement security and IP address assignment policies.

How to Configure DHCP Option 82 Support for Routed Bridge Encapsulation

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Configuring the DHCP Option 82 Support for Routed Bridge Encapsulation Feature

Perform this task to configure the DHCP Option 82 Support for Routed Bridge Encapsulation feature.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip dhcp relay information option**
4. **rbe nasip** *interface-type number*
5. **exit**
6. **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	**ip dhcp relay information option** **Example:** `Router(config)# ip dhcp relay information option`	Enables the system to insert the DHCP relay agent information option in forwarded BOOT REQUEST messages to a Cisco IOS DHCP server.
Step 4	**rbe nasip** *interface-type number* **Example:** `Router(config)# rbe nasip GigabitEthernet 1/1`	Specifies the IP address of an interface on the DHCP relay agent that will be sent to the DHCP server via the agent remote ID suboption.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Router(config)# exit`	Exits global configuration mode and returns to privileged EXEC mode.
Step 6	**more system:running-config** **Example:** `Router# more system:running-config`	(Optional) Displays the running configuration.

Configuration Examples for DHCP Option 82 Support for Routed Bridge Encapsulation

Example DHCP Option 82 Support for Routed Bridge Encapsulation

The following example shows how to enable DHCP option 82 support on the DHCP relay agent using the **ip dhcp relay information option** command. The **rbe nasip** command configures the router to forward the IP address for Loopback0 to the DHCP server.

```
ip dhcp-server 172.16.1.2
!
ip dhcp relay information option
!
interface Loopback0
 ip address 10.1.1.129 255.255.255.192
!
interface ATM 4/0
 no ip address
!
interface ATM 4/0.1 point-to-point
 ip unnumbered Loopback0
 ip helper-address 172.16.1.2
 atm route-bridged ip
 pvc 88/800
  encapsulation aal5snap
!
!
interface Ethernet 5/1
 ip address 172.16.1.1 255.255.0.0
!
router eigrp 100
 network 10.1.0.0
 network 172.16.0.0
!
rbe nasip Loopback 0
```

For this configuration example, the value (in hexadecimal) of the agent remote ID suboption is 010100000B01018140580320. The table below shows the value of each field within the agent remote ID suboption.

Table 2   Agent Remote ID Suboption Field Values

Agent Remote ID Suboption Field	Value
Port type	0x01
Version	0x01
Reserved	Undefined
NAS IP address	0x0B010181 (hexadecimal value of 11.1.1.129)
NAS port • Interface (slot/module/port) • VPI • VCI	• 0x40 (The slot/module/port values are 01 00/0/000.) • 0x58 (hexadecimal value of 88) • 0x320 (hexadecimal value of 800)

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
DHCP Commands	*Cisco IOS IP Addressing Services Command Reference*
DHCP Configuration	*Cisco IOS IP Addressing Services Configuration Guide*
Cisco IOS Wide-Area Networking Commands	*Cisco IOS Wide-Area Networking Command Reference*
Cisco IOS Wide-Area Networking Configuration	*Cisco IOS Wide-Area Networking Configuration Guide*

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

RFCs

RFC	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 DHCP Option 82 Support for Routed Bridge Encapsulation

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 3 *Feature Information for DHCP Option 82 Support for Routed Bridge Encapsulation*

Feature Name	Releases	Feature Information
DHCP Option 82 Support for Routed Bridge Encapsulation	15.1(1)S 12.2(28)SB 12.2(2)T	The DHCP Option 82 Support for Routed Bridge Encapsulation feature allows service providers to create a policy on a DHCP server to determine the number of IP addresses (number of bridging users) to be assigned to a particular ATM VPI/VCI port. The following command was introduced or modified: **rbe nasip**.