



# Per IP Subscriber DHCP Triggered RADIUS Accounting

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The Per IP Subscriber DHCP Triggered RADIUS Accounting feature enables system administrators to track IP session activity on a per-subscriber basis and periodically extract subscriber accounting records. Transactions between the client and the RADIUS accounting server are authenticated via an Access Client module that maintains per-subscriber accounting statistics.

Per IP Subscriber RADIUS Accounting works with DHCP IP address assignment on Cisco 7600 series routers only, and it improves the authentication, authorization, and accounting (AAA) of broadband service delivery. Subscribers are attributed a unique AAA ID in addition to the unique ID created by DHCP in order to process secure START and STOP accounting messages and allow them to abstract accounting information in a client-server environment.

## Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the [“Feature Information for Per IP Subscriber DHCP Triggered RADIUS Accounting” section on page 10](#).

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

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/com>. An account on Cisco.com is not required.

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## Prerequisites for Per IP Subscriber DHCP Triggered RADIUS Accounting

- You must configure accounting on a subset of RADIUS servers to which subscriber accounting statistics will be exported, as defined by the **aaa accounting** command.
- You must configure the number of IP address assignment leases offered to DHCP clients to only one per subscriber, as defined by the **ip dhcp limit lease per interface 1** command.

## Restrictions for Per IP Subscriber DHCP Triggered RADIUS Accounting

- The Per IP Subscriber DHCP Triggered RADIUS Accounting feature is enabled only for subscribers operating with Access Type interfaces on a Cisco 7600 series Broadband Remote Access Server (B-RAS).
- This feature does not support the collection of IP statistics from each source IP address. The feature collects IP statistics for each subinterface rather than each subscriber, and it is triggered only if the command to allow one IP address assignment via DHCP is configured.

## Information About Per IP Subscriber DHCP Triggered RADIUS Accounting

To configure this feature, you should understand the following concepts:

- [Per IP Subscriber DHCP Triggered RADIUS Accounting Network Topology, page 2](#)
- [Per IP Subscriber Triggered RADIUS Accounting Behavior, page 3](#)

## Per IP Subscriber DHCP Triggered RADIUS Accounting Network Topology

Per IP Subscriber DHCP Triggered RADIUS Accounting is implemented in a distributed networking environment, based on the following client-server components:

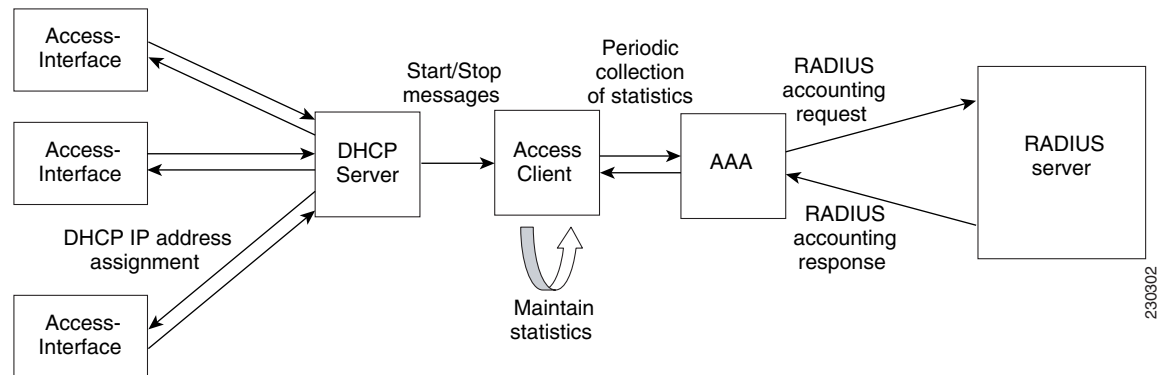
- Access Interface—Used by subscribers to operate on a Cisco 7600 router.
- DHCP Server—Grants permission to the DHCP client to use a particular IP address for a specified lease time.
- AAA Server—Transmits secure START and STOP accounting messages.

After the periodic timer is configured on the unit under test (UUT), the AAA module on the UUT sends an interim periodic update to the RADIUS server.

- RADIUS Server—Receives and responds to accounting requests.

Figure 1 shows how the Access Client, referred to as the “aaa-access-client” module, is initialized to serve as a client of the RADIUS accounting server. The module is independent of existing DHCP RADIUS Accounting modules.

**Figure 1** AAA Access Client Module Interaction



The Access Client comprises two sub-modules that enable improved IP session awareness, tracking, and reporting functionality:

- Access-Subscriber Management module (Access-Acct-Mgmt): Invoked by a successful DHCP IP assignment, this sub-module generates a unique AAA ID for each subscriber that combines with the DHCP unique ID to track an accounting session.
- Access-Subscriber Accounting Management (Access-Acct-Update): Invoked by the AAA server, this sub-module collects subscriber statistics and periodically reports on the accounting session.

## Benefits of Per IP Subscriber DHCP Triggered RADIUS Accounting

### IP Session Awareness and Security

RADIUS accounting provides information about subscribers’ network connections and usage in the form of accounting records.

The Access Client passes per-subscriber accounting statistics to the designated server, with a secure unique AAA ID. The periodic reporting of IP session activity gives system administrators the accounting information they need to make informed security, billing, and resource allocation decisions.

## Per IP Subscriber Triggered RADIUS Accounting Behavior

When a client with an Access Type of interface is configured for Per IP Subscriber RADIUS Accounting, the statistics collection and reporting mechanism can be invoked by the DHCP module. A successful DHCP IP assignment or release triggers three types of accounting events via the Access Client module:

1. RADIUS accounting start: An Accounting Start packet, ACCT\_START, is sent to the accounting server to flag the start of service delivery, the type of service being delivered, and the user it is being delivered to.

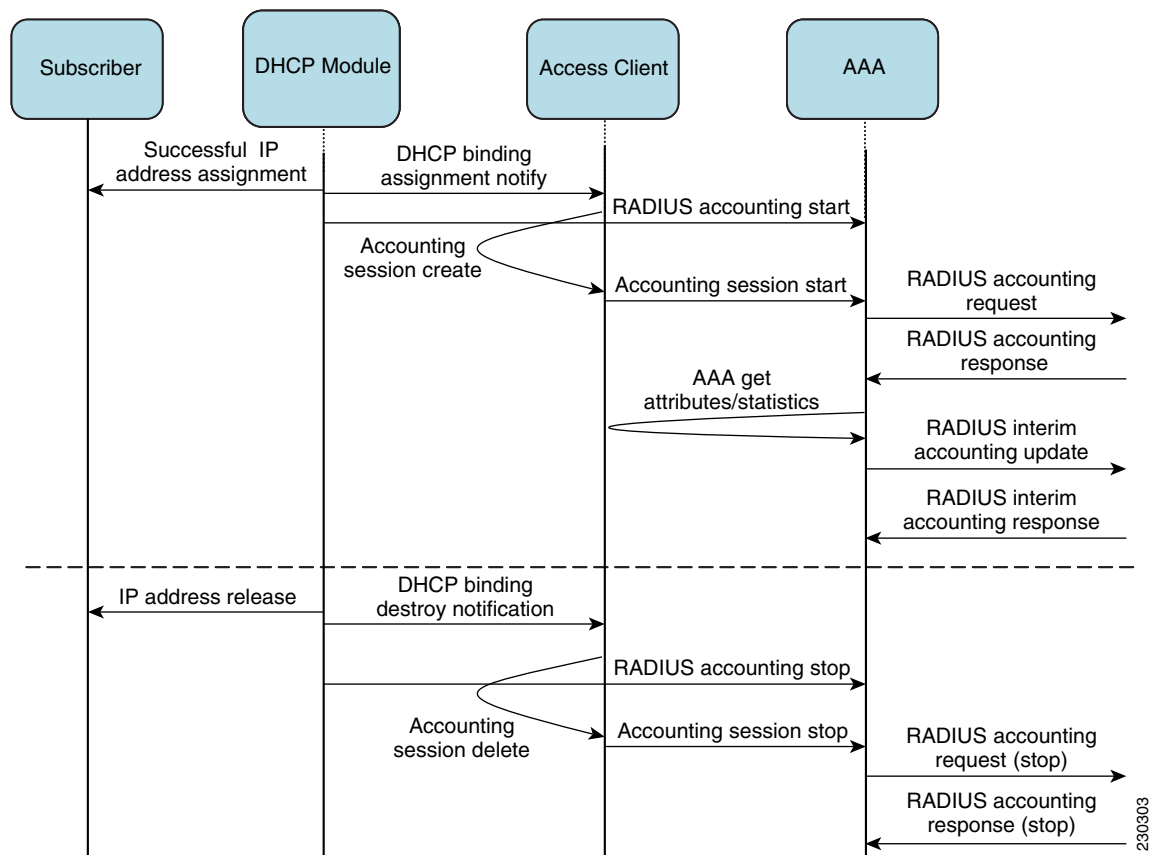
2. RADIUS accounting interim-update: An Accounting Interim Update packet, ACCT\_UPDATE, is sent to the accounting server to flag an ongoing client association and IP session activity.
3. RADIUS accounting stop: An Accounting Stop packet, ACCT\_STOP, is sent to the accounting server to flag the end of service delivery, the type of service that was delivered and optional statistics such as elapsed time, and input and output packets.

Accounting requests, for any packet type, are submitted to the RADIUS accounting server via the network, and are acknowledged in these forms:

- RADIUS Accounting Response (START)
- RADIUS Interim Accounting Response
- RADIUS Accounting Response (STOP)

Figure 2 shows the AAA Access Client process flow and how the client interacts with the required modules.

**Figure 2** AAA Access Client Process Flow



# How to Configure Per IP Subscriber DHCP Triggered RADIUS Accounting

This section contains the following procedure:

- [Configuring Method Lists for Per IP Subscriber DHCP Triggered RADIUS Accounting, page 5.](#)

## Configuring Method Lists for Per IP Subscriber DHCP Triggered RADIUS Accounting

Each subscriber is configured on a per-interface basis. To invoke the Access Client and trigger the statistics collection mechanism on a subinterface, you must specify RADIUS as the accounting method and define a backup system for accounting in case the initial method fails. A method list is a named list describing the accounting methods to be queried in sequence.

Perform this task to configure a named method list for Per IP Subscriber DHCP Triggered RADIUS Accounting.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number* [*name-tag*] *access*
4. **encapsulation dot1q** *vlan-id* [**native**]
5. **ip address** *ip-address mask* [**secondary**]
6. **accounting dhcp source-ip aaa list** *method-list-name*
7. **end**

### 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</b> <i>type number</i> [ <i>name-tag</i> ] <i>access</i>  <b>Example:</b> Router(config)# interface gigabitethernet 1/0/1.2 access	Configures an interface type and enters access interface configuration mode.

	Command or Action	Purpose
Step 4	<b>encapsulation dot1q</b> <i>vlan-id</i> [ <b>native</b> ]  <b>Example:</b> Router(config-subif)# encapsulation dot1q 102	Enables IEEE 802.1q encapsulation of traffic on a specified subinterface in a virtual LAN (VLAN).
Step 5	<b>ip address</b> <i>ip-address mask</i> [ <b>secondary</b> ]  <b>Example:</b> Router(config-subif)# ip address 10.0.2.1 255.255.255.0	Sets a primary or secondary IP address for an interface.
Step 6	<b>accounting dhcp source-ip</b> <b>aaa list</b> <i>method-list-name</i>  <b>Example:</b> Router(config-subif)# accounting dhcp source-ip aaa list default	Enables the Per IP Subscriber DHCP RADIUS Accounting feature for DHCP clients, and configures accounting method lists that define the way accounting will be performed and the sequence in which methods are performed.  Use the <i>method-list-name</i> argument to apply the accounting method list to a subinterface.
Step 7	<b>end</b>  <b>Example:</b> Router(config-subif)# end	Ends the current configuration session and returns to privileged EXEC mode.

## Configuration Examples for Per IP Subscriber DHCP Triggered RADIUS Accounting

This section provides the following configuration example:

- [Subinterface RADIUS Accounting Configuration: Example, page 6](#)

### Subinterface RADIUS Accounting Configuration: Example

In the following example, the **aaa accounting** command for periodic RADIUS accounting is issued in the context of an IP address assignment via DHCP. A named method list is not explicitly defined, and the default method list automatically applies to the subinterface. If no method list is defined, no accounting takes place.

```
configure terminal
aaa new-model
radius-server host 75.0.1.1 auth-port 1645 acct-port 1646 key lab
radius-server key lab
!
aaa accounting network default start-stop group radius
aaa accounting update periodic 1
end
!
configure terminal
ip dhcp pool pool1
network 10.0.1.0 255.255.255.0
lease 0 0 3
!
```

```
configure terminal
interface GigabitEthernet 1/0/1.2 access
encapsulation dot1q 102
ip address 10.0.2.1 255.255.255.0
accounting dhcp source-ip aaa list default
end
```

## Additional References

The following sections provide references related to the Per IP Subscriber DHCP Triggered RADIUS Accounting feature.

## Related Documents

Related Topic	Document Title
Configuring Accounting	“Configuring Accounting” chapter in the <i>Cisco IOS Security Configuration Guide</i> , Release 12.4
Security commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples.	<i>Cisco IOS Security Command Reference</i> , Release 12.4T

## Standards

Standard	Title
None	—

## MIBs

MIB	MIBs Link
None	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
None	—

## Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com.	<a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a>

## Command Reference

This section documents the following new command only.

- [accounting dhcp source-ip aaa list](#)



# accounting dhcp source-ip aaa list

To enable Per IP Subscriber DHCP Triggered RADIUS Accounting for billing or security purposes, use the **accounting dhcp source-ip aaa list** command in access interface configuration mode. To disable Per IP Subscriber DHCP Triggered RADIUS Accounting, use the **no** form of this command.

**accounting dhcp source-ip aaa list** *method-list-name*

**no accounting**

## Syntax Description

<i>method-list-name</i>	Character string used to name at least one of the accounting methods, tried in a given sequence. Valid values are <b>default</b> or a named method list as defined by the <b>aaa accounting</b> command.
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## Command Default

This command is disabled by default. If the **accounting dhcp source-ip aaa list** command for RADIUS accounting is issued without a named method list specified, the default method list is automatically applied to all interfaces except those that have a named method list explicitly defined. A defined method list overrides the default method list. If no default method list is defined, then no accounting takes place.

## Command Modes

Access interface

## Command History

Release	Modification
12.2(33)SRB	This command was introduced.

## Usage Guidelines

Enter the **accounting dhcp source-ip aaa list** command to enable accounting. Use the **aaa accounting** command to create a named method list.

## Examples

The following example shows how to define a command accounting method list named “default”.

```
accounting dhcp source-ip aaa list default
```

## Related Commands

Command	Description
<b>aaa accounting</b>	Enables AAA accounting of requested services for billing or security purposes when you use RADIUS or TACACS+.
<b>ip dhcp limit lease per interface</b>	Limits the number of leases offered to DHCP clients behind an ATM RBE unnumbered or serial unnumbered interface.

# Feature Information for Per IP Subscriber DHCP Triggered RADIUS Accounting

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



## Note

Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

**Table 1** Feature Information for Per IP Subscriber DHCP Triggered RADIUS Accounting

Feature Name	Releases	Feature Information
Per IP Subscriber DHCP Triggered RADIUS Accounting	12.2(33)SRB	<p>The Per IP Subscriber DHCP Triggered RADIUS Accounting feature enables system administrators to track IP session activity on a per-subscriber basis and periodically extract subscriber accounting records.</p> <p>In 12.2(33)SRB, this feature was introduced on the Cisco 7600 router.</p> <p>The following command was introduced by this feature: <b>accounting dhcp source-ip aaa list.</b></p>

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