Cisco SCMS SM RADIUS Listener LEG Reference Guide

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C O N T E N T S

About this Guide

The SCMS SM RADIUS Listener LEG Reference Guide describes the concept of a RADIUS Listener Login Event Generator (LEG), and explains how to install and configure the RADIUS Listener LEG on the Service Control Management Suite Subscriber Manager (SCMS SM) platform.

This document is intended for system administrators and system integrators who are familiar with the RADIUS extensions concept and with Cisco Service Control Subscriber Management and Subscriber Integration concepts.

This introduction provides information about the following topics:

- Document Revision History
- Organization
- Related Publications
- Document Conventions
- Related Documentation
- Obtaining Documentation, Obtaining Support, and Security Guidelines

Document Revision History

Cisco Service Control Release	Part Number	Publication Date
Release 3.1.0	OL-7202-05	May, 2007

Description of Changes

- Updated for release 3.1.0.

Cisco Service Control Release	Part Number	Publication Date
Release 3.0.5	OL-7202-04	November, 2006

Description of Changes

- Added new section describing mapping the RADIUS attribute to the subscriber IP address. See Mapping of RADIUS Attribute to Subscriber IP Address.

- Various other small changes to text.

Cisco Service Control Release	Part Number	Publication Date
Release 3.0.3	OL-7202-03	May, 2006

Description of Changes

- Added new section describing how to configure the stripping of an attribute value. See Configuring Stripping of the Attribute Value.
- Various other small changes to text.

Cisco Service Control Release	Part Number	Publication Date
Release 3.0	OL-7202-02	December, 2005

Description of Changes

- Reorganization of documentation. No major changes or new features were added to this revision.

Cisco Service Control Release	Part Number	Publication Date
Release 2.5.7	OL-7202-01	May, 2005

Description of Changes

- This is the first version of this document.

Organization

The major sections of this guide are as follows:

Table 1

Chapter	Title	Description
Chapter 1	About the RADIUS Listener LEG	Describes the Subscriber Manager RADIUS Listener LEG software module and the terms and concepts used in this guide.
Chapter 2	Installing the RADIUS Listener LEG	Details the procedures for installing the software on the Subscriber Manager. It also describes uninstalling the software and upgrading procedures.
Chapter 3	Configuring the RADIUS Listener LEG	Describes the configuration procedure for the RADIUS Listener LEG.

Table 1

Chapter	Title	Description
Chapter 4	Using the RADIUS Listener LEG CLU	Provides a description of the command-line utility commands when the software is installed on the Subscriber Manager.
Appendix A	Domain Association Algorithm	Describes the algorithm used for deciding the subscriber domain to which a subscriber should be logged on.

Related Publications

Use this *Cisco SCMS SM RADIUS Listener LEG Reference Guide* in conjunction with the following Cisco documentation:

- *Cisco SCMS Subscriber Manager User Guide*

Document Conventions

This guide uses the following conventions:

- **Bold** is used for commands, keywords, and buttons.
- *Italics* are used for command input for which you supply values.
- `Screen` font is used for examples of information that are displayed on the screen.
- **`Bold screen`** font is used for examples of information that you enter.
- Vertical bars (|) indicate separate alternative, mutually exclusive elements.
- Square brackets ([ ]) indicate optional elements.
- Braces ({}) indicate a required choice.
- Braces within square brackets ([{}]) indicate a required choice within an optional element.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the guide.

Timesaver Means the *described action saves time*. You can save time by performing the action described in the paragraph.

Caution Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

⚠

Warning   Means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents. To see translated versions of warnings, refer to the *Regulatory Compliance and Safety Information* document that accompanied the device.

Related Documentation

Use this SCMS SM C/C++ API Programmer Guide in conjunction with all of the SCMS Subscriber Manager User, API, and Reference Guides.

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

About the RADIUS Listener LEG

This module describes the Subscriber Manager RADIUS Listener LEG software module and the terms and concepts used in this guide.

About the RADIUS Listener LEG

The RADIUS Listener LEG is a software module that receives RADIUS Accounting messages, and according to their content, invokes logon operations to the Subscriber Manager (SM). The RADIUS Listener LEG is an extension to the SM software and runs concurrently with the SM.

When the RADIUS Listener LEG receives an Accounting-Start message, it extracts the subscriber ID, the subscriber IP-address, and optionally, the subscriber package index from the message attributes, and triggers a login operation to the SM. In the same manner, Accounting-Interim-Update triggers a login operation, and the Accounting-Stop message triggers a logout operation.

The RADIUS Listener LEG was carefully developed and thoroughly tested with several RADIUS AAA servers and NAS devices.

Terms and Concepts

The following is a list of some terms and concepts that are necessary to understand the RADIUS Listener and SM configuration and operation. Additional information regarding the various issues can be found in the *Cisco SCMS Subscriber Manager User Guide* .

- NAS (Network Access System)
- RADIUS Accounting Start/Interim/Stop
- Subscriber Mappings
- Subscriber Domain
- Subscriber Package
- Topologies

NAS (Network Access System)

A network device that serves as an access point for a remote user. It initiates RADIUS transactions to the RADIUS server to authenticate a remote user.

The RADIUS Listener LEG refers to all of its RADIUS clients as NAS devices, even though they might be RADIUS servers acting as a proxy or forwarding messages.

RADIUS Accounting Start/Interim/Stop

The RADIUS Accounting messages must hold an attribute called Acct-Status-Type . This attribute can receive the value of **start**, **interim-update**, **stop**, or other RADIUS Accounting messages. An Accounting-Start message contains the Acct-Status-Type with the value **start**.

For additional information, see the relevant RADIUS RFC documentation.

Subscriber Mappings

The SCE platform requires mappings between the network IDs (IP addresses) of the flows it encounters and the subscriber IDs. The SM database contains the network IDs that map to the subscriber IDs. The SCE network-ID-to-subscriber mappings are constantly updated from the SM database.

The main function of the RADIUS Listener LEG is to provide the SM with network-ID-to-subscriber mappings in real time.

For information about the SCE platforms, see the *Cisco SCE 1000 2xGBE Installation and Configuration Guide* and the *Cisco SCE 2000 4xGBE Installation and Configuration Guide* .

Subscriber Domain

The SM provides the option of partitioning SCE platforms and subscribers into subscriber domains. A subscriber domain is a group of SCE platforms that share a group of subscribers. Subscriber domains can be configured using the SM configuration file and can be viewed using the SM CLU.

For additional information about domains and domain aliases, see the "Configuration File Options" module of the *Cisco SCMS Subscriber Manager User Guide* .

Subscriber Package

A subscriber policy package usually defines the policy enforced by Cisco SCMS solutions on each subscriber. The RADIUS Listener LEG can handle the package ID in any of the following ways:

- Set the package ID according to a value of a RADIUS attribute
- Set the package ID using a constant default value
- Leave the package ID unset

For additional information, see Mapping of RADIUS Attribute to Subscriber Package, and the *Cisco Service Control Application for Broadband (SCA BB) User Guide* .

Topologies

The following diagram illustrates a topology in which a RADIUS server/proxy forwards or proxies the RADIUS Accounting messages to the RADIUS Listener LEG.

Figure 1-1   ***Example of Radius Server Forwarding Radius Accounting Messages to Radius Listener LEG***
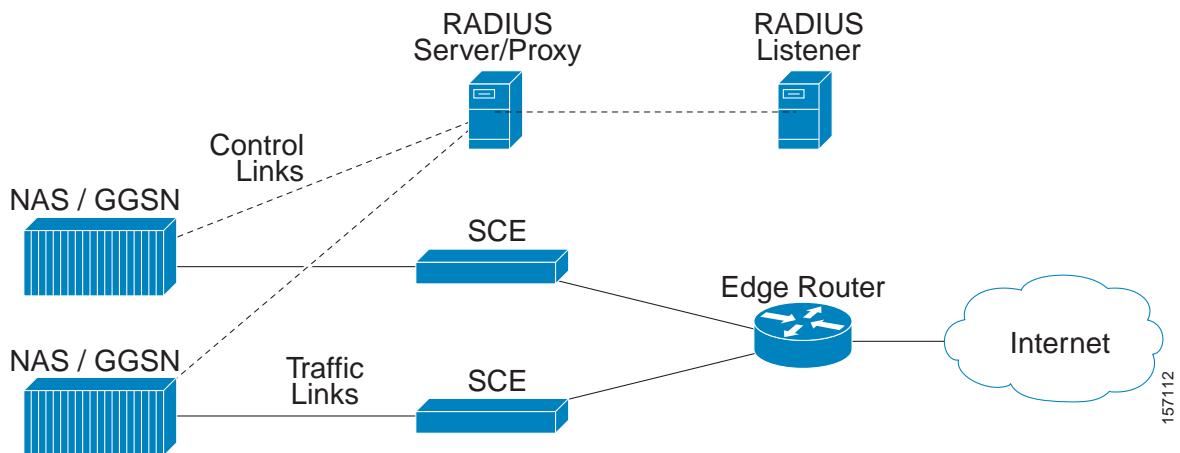
The following diagram illustrates a topology in which the NAS performs authentication with the RADIUS server, and sends RADIUS Accounting messages to the RADIUS Listener LEG and, optionally, to the RADIUS server.

Figure 1-2   ***Example of NAS Sending Radius Accounting Messages to both the Radius Listener LEG and the Radius Server***
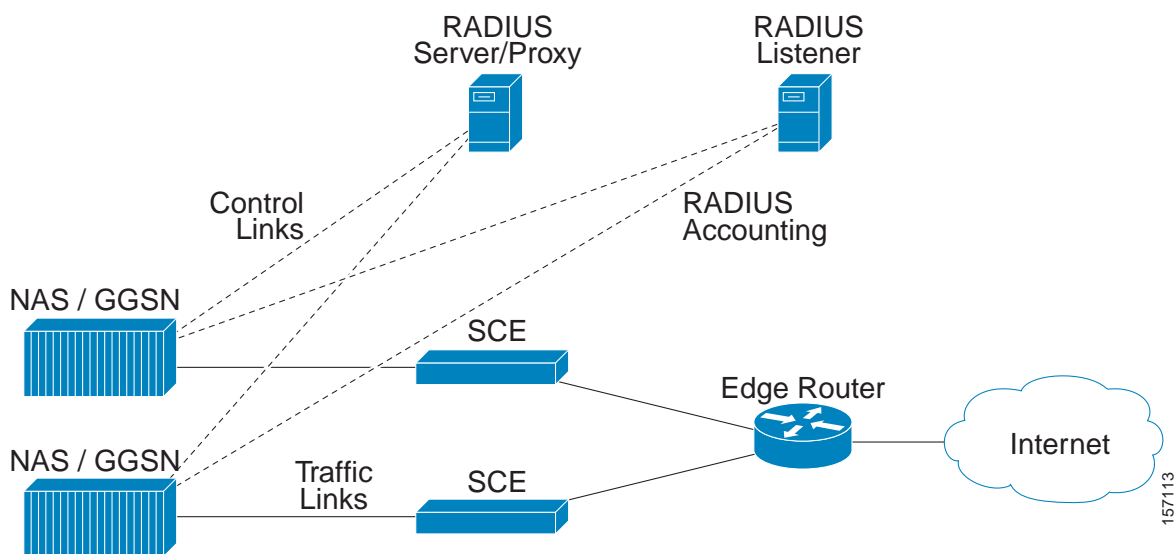
Installing the RADIUS Listener LEG

This module describes the procedures for installing the software on the Subscriber Manager. It also describes uninstalling the software.

The RADIUS Listener LEG is part of the SM installation package. The installation package also includes configuration files and the Command-Line Utility of the LEG.

- Installing the RADIUS Listener LEG Software
- Uninstalling the RADIUS Listener LEG

Installing the RADIUS Listener LEG Software

SUMMARY STEPS

1. Edit the RADUIS Listener LEG configuration file.

2. Load the configuration file using the **p3sm**command-line utility.

3. Configure the NAS devices that are sending RADIUS Accounting messages to the RADIUS Listener LEG.

DETAILED STEPS

Step 1   Edit the RADUIS Listener LEG configuration file.

To run the RADIUS Listener LEG at SM startup, set the **start** parameter to **yes**. See Information About Configuring the General Settings.

Step 2   Load the configuration file using the **p3sm** command-line utility.

Run the **p3sm** command-line utility from the SM CLU **sm-inst-dir/sm/server/bin** (**sm-inst-dir** refers to the SM installation directory):

```
>p3sm --load-config
```

Step 3   Configure the NAS devices that are sending RADIUS Accounting messages to the RADIUS Listener LEG.

The NAS devices may be RADIUS servers acting as RADIUS clients that proxy or forward RADIUS accounting messages to the RADIUS Listener.

These RADIUS clients must be configured according to the RADIUS Listener configuration, as performed in Step 1 above. There are many different RADIUS client devices, each of which is configured in a different manner. See Configuring the NAS Devices for instructions on configuring the RADIUS clients on NAS devices.

Uninstalling the RADIUS Listener LEG

Step 1   Edit the SM configuration file and set the RADIUS Listener **start** parameter to **no**.

For further information, see Information About Configuring the General Settings.

Note   Setting the **start** parameter to **no**does not remove the RADIUS Listener LEG from the SM installation. You can reinstall the software again by setting the **start** parameter to **yes**.

Step 2   Run the **p3sm**CLU.

```
>p3sm --load-config
```

Configuring the RADIUS Listener LEG

This module describes the configuration procedure for the RADIUS Listener LEG.

The RADIUS Listener LEG is configured using the SM configuration file **p3sm.cfg** , which resides in the **sm-inst-dir/sm/server/root/config** directory (**sm-inst-dir** refers to the SM installation directory).

The configuration file consists of sections headed by a bracketed section title; for example, [Radius.Subscriber ID]. Each section consists of several parameters having the format **parameter=value**. The number sign ("#") at the beginning of a line signifies that it is a remark.

The General RADIUS Listener LEG configuration settings reside in the [Radius Listener] section. All additional RADIUS Listener LEG sections start with the prefix **Radius.** , such as **[Radius.NAS.nas1]** , and they are defined initially as remark lines.

- Information About Configuring the General Settings
- Configuring the NAS Devices
- Mapping of RADIUS Attributes

Information About Configuring the General Settings

- [Radius Listener] Section
- Example

[Radius Listener] Section

The **[Radius Listener]** section in the SM configuration file contains the following parameters:

- `start`

  Defines whether the SM should run the RADIUS Listener at startup.

  Possible values for this parameter are **yes**and **no**. The default value is **no**.

- `accounting_port`

  Defines the RADIUS Listener accounting port number.

  The default value is 1813.

- `ip`

The IP address to which the RADIUS listener should bind. Use this parameter only in cases where the IP address used for RADIUS transactions is not the main IP address of the SM machine. (For example in an SM cluster.)

Possible values are any IP address in dotted notation. The default value is not set.

- `packet_types`

Defines the RADIUS protocol packet types to analyze.

Possible values are **accounting-start**, **accounting-interim**, **accounting-stop**separated by a comma.

The default value is **accounting-start,accounting-interim,accounting-stop**.

Example

The following example is a portion of a configuration file illustrating the **[Radius.Listener]** section:

```
[Radius Listener]
# The following parameter defines whether the SM should
# run the RADIUS Listener at startup.
# Receives the values: yes, no. (default no)
start=no
# accounting port number (default 1813)
accounting_port=1813
# RADIUS packet types
packet_types=accounting-start,account-interim,accounting-stop
```

Configuring the NAS Devices

The RADIUS Listener LEG must be configured with the RADIUS clients/NAS devices that transmit RADIUS messages to the LEG, to accept RADIUS messages.

Each **[Radius.NAS.XXX]** section specifies a single Network Access System (NAS), where XXX represents the NAS name.

SUMMARY STEPS

1. Copy the example Radius.NAS.XXX section that exists in the configuration file

2. Configure a section name of the format **[Radius.NAS.my_name_for_the_NAS]**.

3. Configure the **domain** , **IP_address** , **NAS_identifier** , and **secret** parameters:

DETAILED STEPS

Step 1   Copy the example Radius.NAS.XXX section that exists in the configuration file

The remarks from the parameters and section header should be removed.

Step 2   Configure a section name of the format **[Radius.NAS.my_name_for_the_NAS]**.

Step 3   Configure the **domain** , **IP_address** , **NAS_identifier** , and **secret** parameters:

- `domain`

Set the domain parameter with a valid subscriber domain name.

- `IP_address`

Set the IP_address parameter with the NAS IP address with which the RADIUS messages arrive. IP address should be in dotted notation (xxx.xxx.xxx.xxx).

- `NAS_identifier`

  Set the NAS_identifier parameter with a NAS-ID attribute with which the RADIUS messages are sent.

- `secret`

  Set the secret parameter with the secret key defined in the NAS for this connection.

Configuring the NAS Devices: Example

This example is a portion of a configuration file illustrating how to configure the NAS:

```
[Radius.NAS.Access134]
# Cisco's subscriber domain name
domain = subscribers
# IP address in dotted notation
IP_address = 202.156.24.100
# name of the NAS that exists in the NAS-ID attribute
NAS_identifier =ACCESS134
# secret string
secret = secret123
```

Mapping of RADIUS Attributes

- Mapping of RADIUS Attribute to Subscriber Package
- Mapping of RADIUS Attribute to Subscriber IP Address
- Mapping of RADIUS Attribute to Subscriber ID
- Configuring the RADIUS Client

Mapping of RADIUS Attribute to Subscriber Package

Note The configuration described in this section is optional.

Subscriber package configuration in the RADIUS Listener can be handled in any of the following ways:

- Extract the data from a RADIUS attribute
- Set a default value for all subscribers that log on via the RADIUS Listener
- Do not set any package to the subscriber

Extracting Data from a RADIUS Attribute

The attribute configuration is performed in the same manner as described in Mapping of RADIUS Attributes.

Additionally, configure the following parameters:

- use_default

  Defines whether to use a default value if the attribute was not found.

  Possible values for this parameter are **true** and **false**.

  The default value is **true**.

- default

  Defines the default value to use if the attribute was not found.

  There is no default value.

Note   This parameter must be set if the **use_default** parameter is set to **true**.

- mapping_table

  Defines a conversion table between the result of the attribute manipulation (e.g. after stripping), and the property value. The conversion is mandatory if the radius_attribute_type is string. The format of the mapping_table is **<attribute-value>=<property-value>** There is no default value.

Extracting Data from a RADIUS Attribute Example

The following example is a portion of a configuration file illustrating how to configure the subscriber package assignment option. In this example, a VSA is assigned to the subscriber package. It is stripped from its prefix and converted to integer type using a mapping table.

```
[Radius.Property.Package]
# the following is the configuration for using Vendor Specific Attributes (VSA)
radius_attribute = 26
radius_sub_attribute = 1
radius_attribute_vendor_ID = 5655
# the type of the attribute (type "integer" or "string")
radius_attribute type = integer
# strip the prefix
strip_type=remove_prefix
strip_character=@
# this flag indicates whether to use default value
# if the attribute was not found (when not mandatory)
use_default = true
# default property value
default = 0
# definition of mapping table
mapping_table.gold=1
mapping_table.silver=2
mapping_table.bronze=3
```

Setting a Value for All Subscribers

Do not configure the radius attribute parameters. However, set the **use_default** parameter to **true** and set the value of the **default** parameter as needed.

Not Setting Any Package to the Subscriber

Edit the **[Radius.Property.Package]** section with all remark lines. The number sign ("#") at the beginning of a line signifies a remark line.

Mapping of RADIUS Attribute to Subscriber IP Address

The subscriber IP address is normally based on the Framed-IP-Address attribute; however, it can also be based on a different RADIUS attribute. The default is to use the Framed-IP-Address attribute.

The following algorithm is applied to handle IP addresses in this LEG:

1. If the user configured an attribute from which to extract the IP, the LEG will look for that attribute in the packet. If the attribute exists, the LEG will use the attribute as the subscriber IP address.

2. If the attribute does not exist or is not configured, the LEG will look for the Framed-Route attributes; several Framed-Route attributes may exist. If any Framed-Route attributes exist, the LEG will use these attributes as the subscriber IP addresses.

3. If there are no Framed-Route attributes, the LEG will look for a Framed-IP-Address attribute and a Framed-IP-Netmask attribute. If a Framed-IP-Address attribute exists, the LEG will use this attribute as the subscriber IP address. If both the Framed-IP-Address and the Framed-IP-Netmask attributes exist, the operation is performed with the IP range represented by the IP address and the IP netmask.

4. Otherwise, the LEG will perform a login without the IP address.

Note The configured attribute can be a regular RADIUS attribute or a VSA. It is possible to encode the attribute as an integer in which case it will be a single IP address. It can also be encoded as a string and will therefore be an IP-Address/IP-Range value: the value must be formatted as A.B.C.D/E or A.B.C.D.

Note The supported format of the Framed-Route attribute is as described in RFC-2865. It must start with a string that starts with the route itself in the format A.B.C.D/E followed by a space. Other values follow the space, but the LEG ignores these other values.

To define which attribute to use for the subscriber IP address, configure the **[Radius.Subscriber IP Address]** section. To define the attribute to use, configure the following parameters:

- radius_attribute

  Configure the **radius_attribute** parameter with the RADIUS attribute number. Enter the value 26 for Vendor Specific Attributes (VSA).

- radius_attribute_vendor_id

  This parameter is only relevant if **radius_attribute** is configured to 26 (Vendor-Specific attribute).

  The parameter defines the vendor ID number for the subscriber ID classification.

  This parameter has no default value.

- radius_sub_attribute

  This parameter is only relevant if **radius_attribute** is configured to 26 (Vendor-Specific attribute).

  The parameter defines the sub attribute within the vendor specific attribute that is used for subscriber ID classification.

  This parameter has no default value.

- radius_attribute_type

  Configure radius_attribute_type parameter according to the RADIUS attribute format.

Possible values for this parameter are **integer** and **string**. If the type is **string**, you must supply a mapping table.

The default value is **integer**.

Mapping of RADIUS Attribute to Subscriber ID

Note   The configuration described in this section is optional.

The subscriber ID is usually put in the User-Name RADIUS attribute. However, in certain installations, it is possible to use a different RADIUS attribute. For example, in wireless environments, it is possible to use the 3GPP-IMSI or the 3GPP2-IMSI attributes. The default is to use the User-Name attribute.

To define which attribute to use for the subscriber ID, configure the **[Radius.Subscriber ID]** section. To define the attribute to be used, configure the following parameters:

- radius_attribute

    Configure the radius_attribute parameter with the RADIUS attribute number. Enter the value of **26** for Vendor Specific Attributes (VSA).

- radius_attribute_type

    Configure radius_attribute_type parameter according to the RADIUS attribute format.

    Possible values for this parameter are **integer** and **string**. The default value is **integer**.

The following is an example configuration file illustrating how to configure the subscriber ID assignment option. In this example, the User-Name attribute is assigned to the subscriber ID:

```
[Radius.Subscriber ID]
# RADIUS protocol attribute number
radius_attribute=1
# the type of the attribute (type "integer" or "string")
radius_attribute_type = string
```

Configuring the Vendor Specific Attribute (VSA)

Step 1   Set the **radius_attribute** parameter to **26**.

Step 2   Set the **radius_attribute_vendor_id** parameter with the VSA vendor ID.

Step 3   Set the **radius_sub_attribute** parameter with the specific sub-attribute value.

Configuring a Vendor Specific Attribute: Example

The following is an example configuration file illustrating how to configure the subscriber ID assignment option. In this example, the 3GPP_IMSI vendor-specific attribute is assigned to the subscriber ID:

```
[Radius.Subscriber ID]
# in case of a vendor specific attribute (VSA)
# when the 'radius_attribute' is set to 26
# configuration for 3GPP_IMSI
radius_attribute = 26
radius_attribute_vendor_id=10415
```

```
radius_sub_attribute=1
# the type of the attribute (type "integer" or "string")
radius_attribute_type = string
```

Configuring Stripping of the Attribute Value

It is possible to configure the RADIUS listener to strip a RADIUS attribute based on a selected character. This provides a convenient method for obtaining the subscriber ID from a prefix or a suffix of an attribute value.

For example, you can obtain the subscriber ID from the USERNAME attribute value of subscriber@domain-name by stripping the characters after the "at" sign (@) to produce the subscriber.

- Configuring Stripping of the Attribute Value: Example

Step 1   Set the **strip_type** parameter to either **remove_suffix** or **remove_prefix**.

Step 2   Set the **strip_character** parameter to the character up to which, or from which, you want to strip characters.

Configuring Stripping of the Attribute Value: Example

The following is an example configuration file illustrating how to configure the stripping of an attribute value:

```
[Radius.Subscriber ID]
# RADIUS protocol attribute number
radius_attribute=1
# the type of the attribute (type "integer" or "string")
radius_attribute_type = string
strip_char=@
strip_type=remove_suffix
```

Configuring the RADIUS Client

The RADIUS clients are needed to send RADIUS messages to the RADIUS Listener and must be configured to do so.

Step 1   Configure the SM machine as the destination of accounting messages.

You must configure the following parameters:

- The SM IP address

- The UDP ports to which the RADIUS Listener listens

- The shared secret configured for this client in the SM configuration file

Step 2   Verify that the Accounting-Start message is sent with the correct attributes

- The attribute configured in the subscriber ID attribute mapping in the SM configuration file. See Mapping of RADIUS Attribute to Subscriber ID.

- The attribute configured in the subscriber IP address attribute mapping in the SM configuration file, the Framed-Route or the Framed-IP-Address. See Mapping of RADIUS Attribute to Subscriber IP Address.

- (Optional) The attribute configured in the Subscriber package attribute mapping in the SM configuration file. See Mapping of RADIUS Attribute to Subscriber Package.

Step 3   Verify that the Accounting-Stop message is sent with the correct attributes

- The attribute configured in the subscriber ID attribute mapping in the SM configuration file. See Mapping of RADIUS Attribute to Subscriber ID.

- The attribute configured in the subscriber IP address attribute mapping in the SM configuration file, the Framed-Route or the Framed-IP-Address. See Mapping of RADIUS Attribute to Subscriber IP Address.

Note   It is recommended that you configure the RADIUS client to not send Authentication and Accounting-Intermediate messages to the SM to reduce the load of packet handling.

Using the RADIUS Listener LEG CLU

This module describes the command-line utility commands when the software is installed on the Subscriber Manager.

- Information About the p3radius Utility

Information About the p3radius Utility

The **p3radius**utility displays the RADIUS Listener configurations, status, and statistics. The RADIUS Listener configuration includes all configured NAS devices and general RADIUS Listener parameters.

The p3radius command format is **p3radius <operation>**.

The following table lists the **p3radius**operations.

Table 4-1   p3radius Operations

Operation	Description
`--show`	Displays all of the NAS and RADIUS configurations and other general information (status of ports, etc.)
`--show-statistics`	Displays counters of RADIUS messages handled and number of logon operations performed

- Viewing the RADIUS Listener LEG Status
- Viewing the RADIUS Listener LEG Statistics

Viewing the RADIUS Listener LEG Status

The following is an example using the **p3radius**command-line utility with the **show**operation:

```
>p3radius --showRadius Listener information
===========================
running: true
listen-only: true
accounting port: 1813
packet types: accounting-start, accounting-interim, accounting-stop
NASs:
====
name:         Access134
```

```
nasId:         ACCESS134
ip:            202.156.24.100
secret:        secret123
domain:        subscribers
auth-servers: none
acct-servers: none
login on:      accounting-start
Subscriber ID
=============
radius attribute: 1
radius attribute type: string
Properties
==========
radius attribute: 26
radius_vendor_id: 5655
radius_sub_attribute: 1
radius attribute type: string
property name: packageId
Command terminated successfully
>
```

Viewing the RADIUS Listener LEG Statistics

The following is an example of the **p3radius**command-line utility with the **show-statistics**operation:

```
>p3radius --show-statisticsStatistics:
===========
Packets Received:        0
Packets Transmitted:     0
Accounting Request:      0
Accounting Start:        0
Accounting Interim:      0
Accounting Stop:         0
Accounting Response:     0
Dropped:                 0
Successful logins:       0
Failed logins:           0
Successful logouts:      0
Failed logouts:          0
Command terminated successfully
>
```

APPENDIX **A**

# Domain Association Algorithm

This module describes the algorithm used for deciding the subscriber domain to which a subscriber should be logged on.

Domain Association Algorithm

The Radius Listener decides to which domain the subscriber should be logged on, according to the NAS that sent the Accounting-Start message.

However, if the only NAS the Radius Listener is configured with is the proxy device (as illustrated in the following diagram), which is the device from where the RADIUS Listener receives messages, the RADIUS listener cannot distinguish between NAS1 and NAS2 subscribers and cannot map them to different subscriber domains.

Figure A-1   Example of when the only NAS that the Radius Listener is   configured with is the Proxy Device
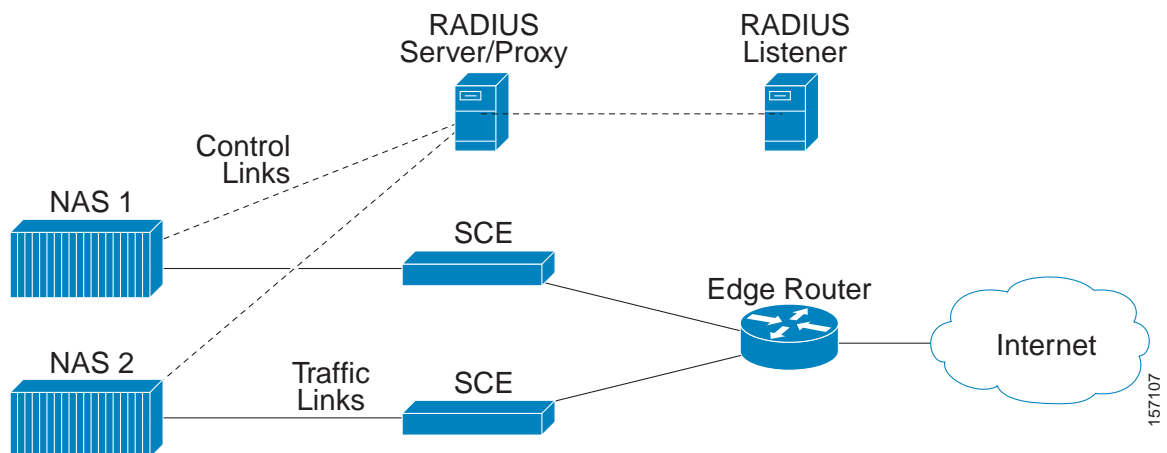
To solve the problem of distinguishing between two NAS devices, the following algorithm is used:

- If a NAS-Identifier attribute exists in the Accounting-Start message and a NAS device is configured with that identifier, this NAS subscriber domain configuration is used.

- If the NAS-Identifier attribute does not exist, the same test will be performed on the NAS-IP-Address attribute. If the NAS-IP-Address attribute exists in the Accounting-Start message the NAS device was configured, this NAS domain configuration is used.

- Otherwise, the domain configured for the NAS identified by the Accounting-Start packet source IP address is used.

Using the Radius attributes provides the ability to distinguish between the two NAS devices.

Note   If none of the three NAS identification characteristics (packet source IP, NAS-Identifier, or NAS-IP-Address) matches the Radius message, the message is dropped because of Radius packet processing reasons. The domain selection stage will not be performed.