CHAPTER 12

Configuring the SCE-Sniffer DHCP Login Event Generator

Revised: March 22, 2012, OL-24194-06

Introduction

This chapter describes how to configure the SCE-Sniffer DHCP Login Event Generator (LEG).

Information About Configuring the SCE-Sniffer DHCP LEG

The SCE-Sniffer DHCP LEG is part of the SM installation package.

The SCE-Sniffer DHCP LEG is configured using two configuration files, **dhcpsnif.cfg** and **dhcp_pkg.cfg**, which reside in the *sm-inst-dir* /sm/server/root/config directory (*sm-inst-dir* refers to the SM installation directory).

The configuration files consist of sections headed by a bracketed section title; for example, **[RDR Server]**. 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 line.

The general configuration of the SCE-Sniffer DHCP LEG resides in **dhcpsnif.cfg**. The dynamic package association configuration resides in **dhcp_pkg.cfg**.

The SCE should be configured to send the Raw Data Records (RDRs) to the LEG.

Configuring the General Settings

The following is a description of the configuration variables of **dhcpsnif.cfg**.

The **[SCE-Sniffer DHCP LEG]** section contains the following parameters:

- start

  Defines whether the SM runs the SCE-Sniffer DHCP LEG at startup.

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

  To extract and handle the DHCP messages received by the RDR server, this parameter must be set to **yes**.

- log_failures

  Defines whether the SM should add messages about failures to the user log.

  Possible values for this parameter are **true** and **false**. The default value is **true**.

- log_all

  Defines whether the SM should add all messages, including successful logins and logouts, to the user log.

  Possible values for this parameter are **true** and **false**. The default value is **false**.

- use_default_domain

  Defines whether all login operations should use the default domain “subscribers”.

  Possible values for this parameter are **true** and **false**. The default value is **true**.

  If the value is set to **false**, the SM will log in the subscribers using the domain name identical to the IP address of the SCE that received the DHCP traffic for that subscriber. In this case, you will have to configure domain aliases as described in *Cisco SCMS Subscriber Manager User Guide*.

- is_cable

  Indicates whether to check if this is a cable modem transaction; i.e., compare the value of the Remote-Id sub-option (option 82 sub-option 2) with the **haddr** DHCP header field. If it is a cable modem transaction, use only the policy information.

  Possible values for this parameter are **true** and **false**. The default value is **true**.

The **[Sniffer]** section contains the following parameters:

- packet_types

  Contains the DHCP packet types to send to the LEG.

  Possible values for this parameter are any combination of the following types: **DHCPACK**, **DHCPRELEASE**. The default value is set to **DHCPACK** and **DHCPRELEASE**.

Note For this LEG to work correctly, use the p3sm.cfg configuration file to enable the RDR server in the SM.

The **[Subscriber ID]** section contains the following parameters:

- dhcp_option

  Defines which DHCP option to use for subscriber ID association. For DHCP options that have sub options, a colon separates the DHCP option and the sub option. The default value is Relay-Agent-Information using the Remote-Id information, i.e. **82:2**.

- dhcp_option_type

  Defines the format type of the DHCP option defined by the **dhcp_option** parameter above.

  Possible values for this parameter are **binary** or **string**. The default value is **binary**.

- dhcp_option_separator

  This parameter is used to concatenate the different options available to create the subscriber ID. The default value is _.

- default_id

  Defines the type of fallback that occurs when packet does not contain the configured DHCP option.

  The possible value for this parameter is **ip** for using the allocated IP to create a subscriber ID in the format IP_a.b.c.d. If this parameter is not set, no fallback occurs, and the login fails. The default is not set.

The following is an example of a configuration file:

```
[SCE-Sniffer DHCP LEG]
start=yes
log_failures=true
log_all=false
use_default_domain=true
is_cable=true
[Sniffer]
packet_types=DHCPACK
[Subscriber ID]
dhcp_option=82:2
dhcp_option_type=binary
default_id=ip
```

Configuring Policy Association

Note The configuration described in this section is optional.

Subscriber policy configuration in the SCE-Sniffer DHCP LEG can be handled in any of the following ways:

- Dynamic assignment of policy information using information extracted from the DHCP packet, see Dynamic Assignment of Policy Information, page 12-4.
- Static assignment of a constant package Id for all subscribers that log on via the SCE-Sniffer DHCP LEG, see Static Assignment of Policy Information, page 12-10.

Dynamic Assignment of Policy Information

Dynamic assignment of policy information is supported if the policy information is submitted in the DHCP packets. The LEG concatenates the desired options and creates a policy-name. It is possible to map using the configuration between the policy-names and the application policy parameters such as package IDs and virtual links. The SCE-Sniffer DHCP LEG can support multiple policies.

To extract the policy information data from the DHCP packet, use the **dhcp_pkg.cfg** configuration file to define the option types that contain the policy information and define the conversion map of the policy-names to the package IDs (or any other policy) of the Service Control Application for Broadband (SCA BB).

The LEG is able to add additional data to the login operation based on the LEG configuration. This data is added as a key-value pair. Other modules in the login chain can use this data, such as the SOAP LEG (see the SOAP LEG section). This data can be created by concatenating the data of several DHCP options and can be given a user-defined label.

The **[DHCP.Policy.XXX]** sections contain the following parameters:

- options_order_for_policy_name

  Defines the DHCP options that contain the policy association information and defines the order of concatenation of the data. The DHCP header field called giaddr (Relay-Agent IP) is also supported; it requires the use of the type integer in the **option_type** parameter.

  This parameter has no default value.

  The format is: **option[:subtype],option[:subtype],giaddr**

- options_type

  Defines the format type of the DHCP options and fields defined by the **options_order_for_policy_name** parameter.

  Possible values for this parameter are **binary** (a binary string that is converted to an ASCII hexadecimal string), **string** (an ASCII string), or **integer** (a 4-byte integer converted to an IP address string in dotted notation). Order the list in the same way as **options_order_for_policy_name**.

  This parameter has no default value.

- name_seperator_value

  Defines the separator character to use between two options when concatenating them to each other to create the policy name. Any character is accepted. The default value is '_'.

- use_default

  Determines whether to use a default policy when no policy information can be extracted from the DHCP data, such as the configurable options are missing or no options were configured.

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- default_policy

  Defines the default policy ID to use if no policy information is extracted from the DHCP data. This parameter is relevant only if the **use_default** parameter is set to **true**.

  Possible values for this parameter are any integer number. This parameter has no default value.

- allow_login_with_no_policy

  Defines whether to perform a login without policy information when no policy information can be extracted from the DHCP data and the **use_default** parameter is set to **false**.

  This parameter is relevant only if the **use_default** parameter is set to **false**.

  Possible values for this parameter are **true** or **false**. The default value is **true**.

- ignore_policy_list

  Defines a list of indexes separated by commas where each index represents a policy or package value. On login operation, if the current subscriber policy is one of the values defined in this attribute, a login operation occurs without changing the subscriber policy value.

- policy_property_name

  Defines the name of the application property that contains the policy information. This parameter has no default value.

Note The **policy_property_name** parameter is case sensitive and must be written exactly as defined by the SCA BB Console. For example, **packageId**, **monitor**, **upVlinkId**, or **downVlinkId.**

- log_all

  Defines whether to write detailed user-log messages for all policy association events.

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- log_default_assignment

  Defines whether to write a user-log message for every assignment of the default value (as defined by the **default_policy** parameter).

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- mapping_table.<policy_name>

  Multiple entries containing the information to convert from the policy information as it appears in the DHCP packet to the policy property value to be used by the SCA BB application.

  These entries do not have default values.

Note The policy_name is case sensitive and must be written exactly as it exists in the DHCP packets.

The **[DHCP.Policy.VirtualLinkDownstream]** section of the configuration file contains the following parameters:

- options_order_for_policy_name

  Defines the DHCP options that contain the policy association information and defines the order of concatenation of the data. The DHCP header field called giaddr (Relay-Agent IP) is also supported; it requires the use of the type integer in the **option_type** parameter.

  This parameter has no default value.

  The format is: **option[:subtype],option[:subtype],giaddr**

- options_type

  Defines the format type of the DHCP options and fields defined by the **options_order_for_policy_name** parameter.

  Possible values for this parameter are **binary** (a binary string that is converted to an ASCII hexadecimal string), **string** (an ASCII string), or **integer** (a 4-byte integer converted to an IP address string in dotted notation). Order the list in the same way as **options_order_for_policy_name**.

  This parameter has no default value.

- name_seperator_value

  Defines the separator character to use between two options when concatenating them to each other to create the policy name. Any character is accepted. The default value is '_'.

- default_policy

  Defines the default policy ID to use if no policy information is extracted from the DHCP data. This parameter is relevant only if the **use_default** parameter is set to **true**.

  Possible values for this parameter are any integer number. This parameter has no default value.

- allow_login_with_no_policy

  Defines whether to perform a login without policy information when no policy information can be extracted from the DHCP data and the **use_default** parameter is set to **false**.

  This parameter is relevant only if the **use_default** parameter is set to **false**.

  Possible values for this parameter are **true** or **false**. The default value is **true**.

- docsis_3_cm_detection

  Defines how to detect whether a subscriber is related to the DOCSIS 3.0 WB interface. The default value will be empty. The possible values are Modem_Type.DOCSIS3.0 or can be empty.

- policy_property_name

  Defines the name of the application property that contains the policy information. This parameter has no default value.

Note The **policy_property_name** parameter is case sensitive and must be written exactly as defined by the SCA BB Console, for example, **packageId**, **monitor**, **upVlinkId**, or **downVlinkId.**

- log_all

  Defines whether to write detailed user-log messages for all policy association events.

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- log_default_assignment

Defines whether to write a user-log message for every assignment of the default value (as defined by the **default_policy** parameter).

Possible values for this parameter are **true** or **false**. The default value is **false**.

- mapping_table.<policy_name>

  Multiple entries containing the information to convert from the policy information as it appears in the DHCP packet to the policy property value to be used by the SCA BB application.

  These entries do not have default values.

The **[DHCP.Policy.VirtualLinkUpstream]** section of the configuration file contains the following parameters:

- options_order_for_policy_name

  Defines the DHCP options that contain the policy association information and defines the order of concatenation of the data. The DHCP header field called giaddr (Relay-Agent IP) is also supported; it requires the use of the type integer in the **option_type** parameter.

  This parameter has no default value.

  The format is: **option[:subtype],option[:subtype],giaddr**

- options_type

  Defines the format type of the DHCP options and fields defined by the **options_order_for_policy_name** parameter.

  Possible values for this parameter are **binary** (a binary string that is converted to an ASCII hexadecimal string), **string** (an ASCII string), or **integer** (a 4-byte integer converted to an IP address string in dotted notation). Order the list in the same way as **options_order_for_policy_name**.

  This parameter has no default value.

- name_seperator_value

  Defines the separator character to use between two options when concatenating them to each other to create the policy name. Any character is accepted. The default value is '_'.

- default_policy

  Defines the default policy ID to use if no policy information is extracted from the DHCP data. This parameter is relevant only if the **use_default** parameter is set to **true**.

  Possible values for this parameter are any integer number. This parameter has no default value.

- allow_login_with_no_policy

  Defines whether to perform a login without policy information when no policy information can be extracted from the DHCP data and the **use_default** parameter is set to **false**.

  This parameter is relevant only if the **use_default** parameter is set to **false**.

  Possible values for this parameter are **true** or **false**. The default value is **true**.

- docsis_3_cm_detection

  Defines how to detect whether a subscriber is related to the DOCSIS 3.0 WB interface. The default value will be empty. The possible values are Modem_Type.DOCSIS3.0 or can be empty.

- policy_property_name

  Defines the name of the application property that contains the policy information. This parameter has no default value.

Note The **policy_property_name** parameter is case sensitive and must be written exactly as defined by the SCA BB Console. For example, **packageId**, **monitor**, **upVlinkId**, or **downVlinkId.**

- log_all

  Defines whether to write detailed user-log messages for all policy association events.

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- log_default_assignment

  Defines whether to write a user-log message for every assignment of the default value (as defined by the **default_policy** parameter).

  Possible values for this parameter are **true** or **false**. The default value is **false**.

- mapping_table.<policy_name>

  Multiple entries containing the information to convert from the policy information as it appears in the DHCP packet to the policy property value to be used by the SCA BB application.

  These entries do not have default values.

The **[Additional Data]** section of the configuration file contains the following parameters:

- label_options

  Defines which DHCP option to extract to add to the login operation.

  Possible values are the option number or, in the case of DHCP options with sub-options, the option and sub-option separated by a colon. For example, 43:123 or 61.

  There is no default value for this parameter.

- label_keys

  Defines the keys that should mark the DHCP options defined by the **label_options** parameter.

  There is no default value for this parameter.

- label_options_type

  Defines the format type of the DHCP option defined by the **label_options** parameter.

  Possible values for this parameter are **binary** (a binary string that is converted to an ASCII hexadecimal string) or **string** (an ASCII string).

  The default value is **binary**.

Dynamic Assignment of Policy Information Example

Suppose that the policy information appears inside option 43 (Vendor-Specific Option) of the DHCP packet and that both subtypes, 102 and 101, are in use. Configure the **options_order_for_policy_name** parameter as follows:

```
options_order_for_policy_name=43:102,43:101
```

Suppose that option 43 with subtype 102 contains the type of package (gold, silver, or bronze), and that option 43 with subtype 101 contains domain information (the package type has a different meaning in different domains). If the separator value is configured to the default value, configure the mapping_table entries as follows:

```
mapping_table.gold_domain1=11
mapping_table.gold_domain2=12
mapping_table.silver_domain1=13
mapping_table.silver_domain2=14
```

This configuration means that if the DHCP packet contains the value 'gold' inside option 43 with subtype 102, and the value 'domain1' inside option 43 with subtype 101, the package ID that are associated to the subscriber in the SM will have the value 11.

The following configuration describes how to add the data of the Relay-Agent Circuit-Id option as additional data to the login operation:

```
[Additional Data]
label_options=82:1
label_keys=PORT_ID
label_option_type=string
```

The following is an example of the entire configuration file:

```
[DHCP.Policy.Package]
options_order_for_policy_name=43:102,43:101
name_separator_value=_
use_default=true
default_policy=1
policy_property_name=packageId
allow_login_with_no_policy=false
log_all=false
log_default_assignment=false
mapping_table.gold_domain1=11
mapping_table.gold_domain2=12
mapping_table.silver_domain1=13
mapping_table.silver_domain2=14
[Additional Data]
label_options=82:1
label_keys=PORT_ID
label_option_type=string
```

Static Assignment of Policy Information

If the installation does not require dynamic assignment of package information, the configuration file **dhcp_pkg.cfg** should define the default package ID to be assigned to all the subscribers, as shown in the following example:

```
[DHCP.Policy.Package]
policy_property_name=packageId
allow_login_with_no_policy=false
use_default=true
default_policy=1
[DHCP.Policy.VirtualLinkDownstream]
policy_property_name=downVlinkId
allow_login_with_no_policy=false
use_default=true
default_policy=0
[DHCP.Policy.VirtualLinkUpstream]
policy_property_name=upVlinkId
allow_login_with_no_policy=false
use_default=true
default_policy=0
```

All other configuration parameters should not be set.

Applying the Configuration on the SM

After editing the relevant configuration files, use the following p3sm command-line utility to load the configuration file:

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

Configure the SCE to Send RDRs to the LEG

Run the RDR-formatter CLI on the SCE platform to add the LEG as a category 3 RDR destination. You must use the same port number as defined by the RDR server in the SM. The default port number is 33001.

Note To support SM cluster topology, set the cluster VIP as the SM-IP in the following CLI.

```
SCE2000>configure
SCE2000(config)>RDR-formatter destination SM-IP port port category number 3 priority 100
SCE2000(config)>exit
```