Cisco SCMS SM SOAP LEG Reference Guide

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*Cisco **SCMS SM SOAP LEG** Reference Guide*

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Preface

This guide describes the concept of a SOAP architecture using the Login Event Generator (LEG), and explains how to install and configure it on the SCMS Subscriber Manager (SM) platform.

Note This guide assumes a basic familiarity with telecommunications equipment and installation procedures, Cisco SCMS subscriber management, and subscriber integration concepts.

For complete information regarding Cisco's subscriber integration concept, see the *Cisco Service Control Management Suite (SCMS) Subscriber Manager (SM) User Guide.*

Document Revision History

Cisco Service Center Release	Part Number	Publication Date
Release 3.0.5	OL-12487-01	November, 2006

Description of Changes

- This is the first release of this document.

Audience

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

Organization

This guide covers the following topics:

Chapter	Title	Description
Chapter 1	*About the SOAP LEG* (on page 1-1)	Describes the SOAP LEG software module, and terms and concepts.
Chapter 2	*Installing the SOAP LEG* (on page 2-1)	Describes the installation process for installing the SOAP LEG.

Chapter	Title	Description
Chapter 3	*Configuring the SOAP LEG* (on page 3-1)	Provides the configuration instructions to configure the SOAP LEG.
Chapter 4	*SOAP LEG Command-Line Utility (CLU)* (on page 4-1)	Provides a description of the command-line utility commands when the software is installed on the Subscriber Manager.
Appendix A	*Appendix A - Cisco WSDL* (on page A-1)	The Cisco WSDL.

Related Documentation

This Reference Guide should be used in conjunction with the following Cisco documentation:

- *Cisco SCMS Subscriber Manager User Guide*
- *Cisco Service Control Application for Broadband User Guide*

Conventions

This document uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{x | y | z}	Alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string, or the string will include the quotation marks.
`screen` font	Terminal sessions and information that the system displays are in `screen` font.
`boldface screen` font	Information you must enter is in **`boldface screen`** font.
`italic screen` font	Arguments for which you supply values are in ***`italic screen`*** font.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to materials not covered in this manual.

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

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P3 and P4 level problems are defined as follows:

- P3—Your network is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for *Cisco.com* (on page vi), go to *http://tools.cisco.com/RPF/register/register.do*.

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at *http://www.cisco.com/tac/caseopen*.

Contacting TAC by Telephone

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P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

CHAPTER 1

About the SOAP LEG

The ***Cisco SCMS SM SOAP LEG*** is a software module that can query an external server via the Simple Object Access Protocol (SOAP) in order to obtain additional information for the subscribers that were logged-in to the SM via various APIs and LEGs. The main purpose of the SOAP LEG is to define the policy of the subscriber based on the input data, the package association configuration, and the query results.

The LEG can query any external server via the SOAP communication protocol if the external server implements an interface defined by the ***Cisco SCMS SM SOAP LEG***.

The ***Cisco SCMS SM SOAP LEG*** supports SOAP 1.1.

The ***Cisco SCMS SM SOAP LEG*** is an extension of the Subscriber Manager (SM) software and runs as part of the SM.

This chapter contains the following sections:

- SOAP Integration Overview 1-1
- Common Topologies 1-3
- Terms and Concepts 1-5

SOAP Integration Overview

The SM activates the SOAP LEG in order to obtain the policy value (or part of the policy value) for the subscribers that are already logged in to the SM.

With the data that the SOAP LEG receives from the SM, it creates a SOAP request, which it issues to the external server in order to retrieve the policy value. After the external server replies, the SOAP LEG determines the policy value according to the input data, the package association configuration, and the query results. It then initiates a subscriber login to the SM. For more information about the package association, see *Configuring the Package Association* (on page 3-3).

Query Interface

The SOAP installation package includes a WSDL file. This WSDL file defines the SOAP LEG query to the external server:

```
QuerySubscriberOut querySubscriber(QuerySubscriberIn subIn)
```

The `QuerySubsriberIn` parameter contains the following data:

- `subscriberId`—Contains the ID of the subscriber
- `mappings`—Contains the Network IDs of the subscriber
- `keys/values`—May contain additional data that the external server may need in order to perform the query

The Web Server responds to the query and SOAP LEG analyzes the results. The output of the Web Server (QuerySubscriberOut) consists of the following elements:

- `subscriberId`—Contains the ID of the subscriber
- `mappings`—Contains the Network IDs of the subscriber
- `keys/values`—May contain additional data that the SOAP LEG may need in order to determine the package value
- `propertyKeys/propertyValues`—May contain subscriber properties; for example, packageId or monitor.

Note that `keys` and `values` are used internally by the LEG for the package association procedure and are not passed to the SM when the subscriber is logged in.

Upon receiving a reply from the Web Server, the SOAP LEG adds the query output values to the query input values. Following this, if the SOAP LEG is configured to do so, the LEG uses this data as the input for the package association procedure. See *Configuring the Package Association* (on page 3-3).

Secure Requests

The SOAP LEG is able to issue a secure request to the external server using the UsernameToken profile as defined in the WS-Security specification. Specifically, it attaches username and password to every SOAP request it sends. For further information on configuring the username and password, see *Using the SOAP LEG Command-Line Utility (CLU)* (on page 4-1).

Note The SOAP LEG supports only text passwords.

Implementing Query Interface at the Server

To integrate the external server with the SOAP LEG:

Step 1 Compile the provided WSDL file using one of the various tools available. For example, Apache Axis can be used (*http://ws.apache.org/axis/*). The WSDL file is included in *Appendix A* (on page A-1).

Step 2 Provide the implementation of the querySubscriber function according to the server business logic.

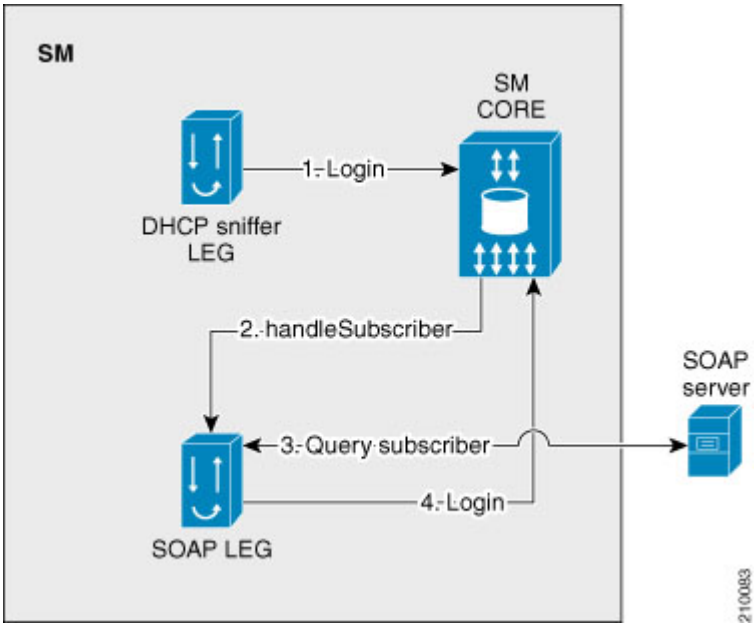
Common Topologies

You can use the SOAP LEG in any SM topology, providing it is possible to supply the LEG with the information it needs in order to perform the query to the policy server and determine the subscriber policy.

The following figures show the most common topologies.

The following figure shows the topology with the SM API:

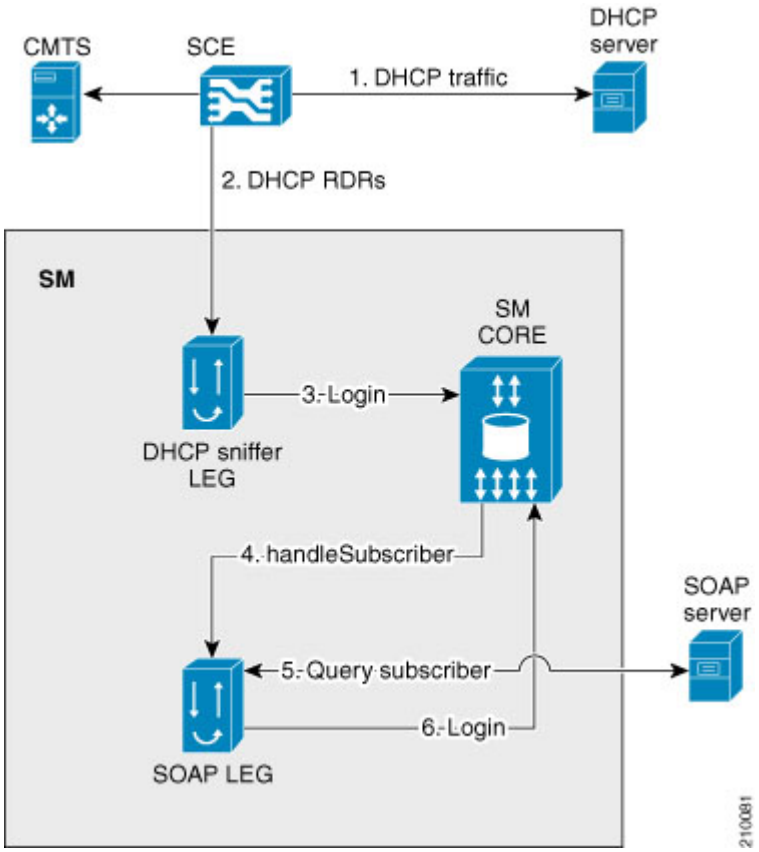
Figure 1-1: SOAP Topology with SM API



The SM API performs a login operation to the SM (1). The SM identifies that the SOAP LEG needs be activated, and therefore it does not perform a subscriber login at this stage. The SM core passes the information received from the SM API to the SOAP LEG (2). The SOAP LEG queries the SOAP server and identifies the relevant packageId based on the configuration, input parameters, and the query results (3). The SOAP LEG then performs a login operation to the SM (4).

The following figure shows the topology with the DHCP Sniffer LEG:

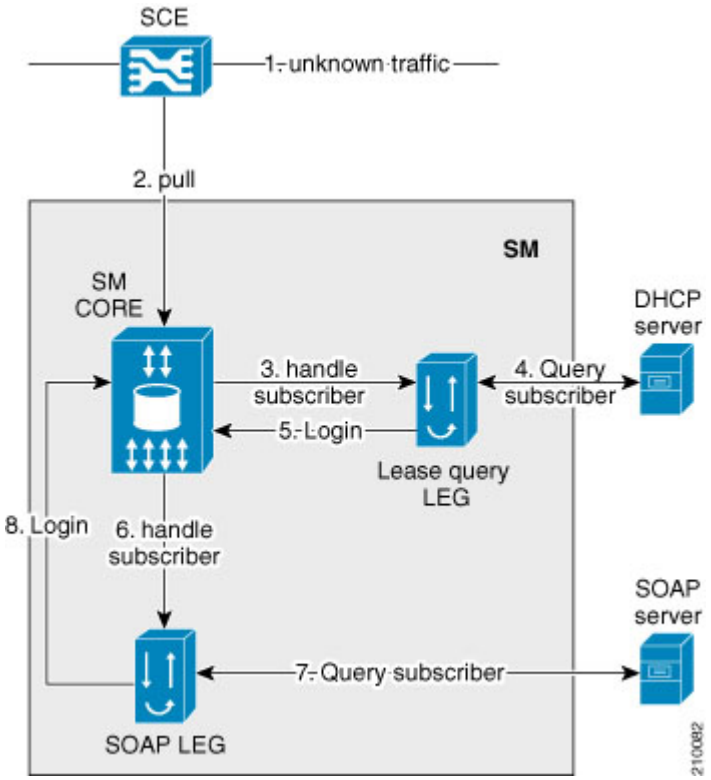
Figure 1-2: SOAP LEG Topology with DHCP Sniffer LEG



The DHCP traffic passes through the SCE (1), which sends a DHCP RDR to the DHCP Sniffer LEG (2). The DHCP Sniffer LEG extracts the relevant information and performs a login operation to the SM (3). The SM identifies that the SOAP LEG needs to be activated, and therefore it does not perform a subscriber login operation at this stage. The SM core passes the information received from the DHCP Sniffer LEG to the SOAP LEG (4). The SOAP LEG queries the SOAP server and identifies the relevant packageId based on all the information received and the query results (5). The SOAP LEG then performs a login operation to the SM (6).

The following figure shows the topology with the DHCP Lease Query LEG:

Figure 1-3: SOAP LEG Topology with DHCP Lease Query LEG



Unknown traffic passes through the SCE (1), which issues a pull request to the SM (2). The SM issues an anonymous-pull-request to the DHCP Lease Query LEG (3). The DHCP Lease Query LEG then queries the DHCP server (4), after which it performs a login operation to the SM (5). The SM identifies that the SOAP LEG needs to be activated, and therefore it does not perform a subscriber login at this stage. The SM Core passes all of the information received from the DHCP Lease Query LEG to the SOAP LEG (6). The SOAP LEG queries the SOAP server and identifies the relevant packageId based on the information received and the query results (7). The SOAP LEG then performs a login operation to the SM (8).

Terms and Concepts

The following terms and concepts are necessary to understand the SOAP LEG and SM configuration and operation. Additional information can be found in the *Cisco SCMS Subscriber Manager User Guide*.

LEG (Login Event Generator)

A software component that performs subscriber login and logout operations on the SM, which is used to handle dynamic subscriber integration.

Subscriber ID

The Service Control solution requires a unique identifier for each subscriber. A subscriber ID represents a logical subscriber entity from the service provider perspective.

Subscriber Network IDs (mappings)

The subscriber network IDs (mappings) are a list of network identifiers, such as IP addresses or VLANs. The SCE uses these identifiers to associate network traffic with subscriber records.

Subscriber Package

A subscriber policy package usually defines the policy enforced by Cisco SCMS solutions on each subscriber. The main function of the SOAP LEG is to determine a package value based on the input parameters, configuration, and query results.

For additional information, see the *Cisco Service Control Application for Broadband User Guide*.

SOAP

SOAP is a lightweight protocol intended for exchanging structured information in a decentralized, distributed environment. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying protocols. The framework has been designed to be independent of any particular programming model and other implementation specific semantics.

WSDL

WSDL is an XML format for describing network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information. The operations and messages are described abstractly, and then bound to a concrete network protocol and message format to define an endpoint. Related concrete endpoints are combined into abstract endpoints (services).

WSS

WS-Security (Web Services Security) is a communications protocol providing a means for applying security to Web Services. Originally developed by IBM, Microsoft, and VeriSign, the protocol is now officially called WSS and is developed and maintained via committee in Oasis-Open.

The protocol contains specifications on how integrity and confidentiality can be enforced on Web Services messaging. WS-Security incorporates security features in the header of a SOAP message and thus works in the application layer. Thus, it ensures end-to-end security.

UsernameToken Profile

The <wsse:UsernameToken> is an element introduced in the WSS SOAP Message Security documents as a way of providing a username.

CHAPTER 2

Installing the SOAP LEG

This chapter describes the procedures for installing the ***SM SOAP LEG*** software module. It also describes the uninstall procedure.

The SOAP LEG is an external component (PQI) that should be installed on the SM. The SOAP LEG distribution is part of the SM LEG distribution.

The SOAP LEG installation package includes a set of configuration files, a WSDL file containing a query definition, and the Command-Line Utility (CLU).

This chapter contains the following sections:

- Installing the SOAP LEG Software 2-1
- Uninstalling the SOAP LEG 2-2
- Upgrading the SOAP LEG 2-3

Installing the SOAP LEG Software

Note Before installation, verify that the Service Control Application for Broadband (SCA BB) is installed on all SM and SCE devices. If the application has not been installed, install the application as described in the *Cisco Service Control Application for Broadband User Guide*.

Note After the installation of the PQI file, the SM will automatically restart.

To install the SOAP LEG:

Step 1 Install the PQI file of the SOAP LEG

Run the p3inst command line utility from the SM CLU `<sm-inst-dir>/sm/server/bin` (*sm-inst-dir* refers to the SM installation directory):

```
> p3inst --install -f soapleg.pqi
```

Step 2 Edit the configuration files of the SOAP LEG

The SOAP LEG includes two configuration files under the configuration folder of the SM (*<sm-inst-dir>/sm/server/root/config*):

a) *soap_leg.cfg*—Configures the general attributes of the LEG

b) *soap_pkg.cfg*—Configures the rules for package assignment

Note It is recommended to familiarize yourself with these files immediately after the first installation and edit them according to your specific needs. See *Configuring the SOAP LEG* (on page 3-1) for more information.

Step 3 Load the configuration file to the SM

Run the **p3sm** command line utility from the SM CLU:

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

This command-line utility loads the new configuration to the SM and activates it.

Note After the install process has successfully completed, the SM will automatically restart.

Uninstalling the SOAP LEG

To uninstall the SOAP LEG:

Run the **p3inst** command line utility from the SM CLU:

```
> p3inst --uninstall -f soapleg.pqi
```

Note After the uninstall process has successfully completed, the SM will automatically restart.

Upgrading the SOAP LEG

The SOAP LEG and SM versions must be identical; therefore, the SOAP LEG must be upgraded as part of the SM upgrade process. The upgrade for the SOAP LEG should be performed together with the upgrade process of the SM.

To upgrade the SOAP LEG:

Step 1 Backup the configuration files of the SOAP LEG. The original configuration files are deleted by the uninstall process in the next step.

Step 2 Uninstall the SOAP LEG by running the following CLU:

```
> p3inst --uninstall -f <soapleg.pqi>
```

Note After the uninstall process has successfully completed, the SM automatically restarts.

Step 3 Perform an upgrade of the SM as described in the *Cisco SCMS Subscriber Manager User Guide*.

Step 4 Install the new version of the SOAP LEG by running the following CLU:

```
> p3inst --install -f <soapleg.pqi>
```

Step 5 Restore the configuration files of the SOAP LEG using the backup configuration files from Step 1.

Step 6 Load the new configuration of the SM by running the following CLU:

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

Configuring the SOAP LEG

The SOAP LEG is configured using two configuration files, *soap_leg.cfg* and *soap_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 file is loaded only upon ***SM SOAP LEG*** startup.

The configuration files consist of sections headed by a bracketed section title; for example, `[SOAP-LEG]` for the SOAP LEG configuration section. Each section consists of one or more parameters having the format `parameter=value`. The number sign ("#") at the beginning of a line signifies that it is a comment.

The general configuration of the SOAP LEG resides in *soap_leg.cfg*. The dynamic package association configuration resides in *soap_pkg.cfg*.

This chapter contains the following sections:

- Configuring the SOAP LEG Settings 3-1
- Configuring the Package Association 3-3

Configuring the SOAP LEG Settings

The `[SOAP-LEG]` section in the configuration file defines the behavior of the SOAP LEG and contains the following parameters:

- *start*

  Defines whether to start the LEG at SM startup.

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

  The default value is **`false`**.

- *server_url*

  The URL of the policy server the LEG will query.

  There is no default value.

  This parameter must be configured for proper LEG functioning

- *log_failed_queries*

  Defines whether the LEG will log messages that are issued for failed queries.

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

  The default value is **true**.

- *log_all_queries*

  Defines whether the LEG will log messages for every query sent and any reply received.

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

  The default value is **false**.

Note This parameter should only be set to **true** when troubleshooting.

- *log_login_failures*

  Defines whether the LEG will log messages when a reply is received that did not result in the subscriber logging into the SM.

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

  The default value is **true**.

The [Package] section in the configuration file contains the following parameter:

- *pkg_cfg_file*

  Defines the configuration file to be used by the converter. The path must be relative to the *config* directory.

  The default value is *soap_pkg.cfg*

Configuration File Example

The following example illustrates the SOAP LEG configuration file:

```
[SOAP-LEG]
server_url=http://1.1.1.1:8080/services/QueryServiceSoap.asmx
log_failed_queries=true
log_all_queries=false
log_login_failures=true
[Package]
pkg_cfg_file=soap_pkg.cfg
```

Configuring the Package Association

Note The configuration described in this section is optional.

This configuration file is intended for the customization of the output produced by the SOAP LEG.

The LEG concatenates the data extracted from the configured labels and creates a package name.

To extract the package information data from the SOAP package, the *soap_pkg.cfg* configuration file must define the conversion map of *package-names* to the package IDs of the SCA BB application.

The [SOAP.Policy.Package] section of the configuration file contains the following parameters:

- *policy_name_format*

  This parameter is a comma-separated list that specifies the labels that contain the data from which the policy name is comprised. The LEG converter searches for the labels within the received arguments and concatenates them according to the specified order. A value of **LABEL_A, LABEL_B** indicates that the SOAP LEG needs to concatenate values that reside under the LABEL_A and LABEL_B labels.

  There is no default value for this parameter.

- *name_seperator_value*

  Defines the separator value to use when concatenating options.

  The default value is '_'.

- *default_value*

  Defines the default value to use when it is not possible to associate the created policy name with any of the configured policy names.

  There is no default value for this parameter.

- *allow_login_with_no_policy*

  Defines whether a login can be performed when no policy is found for assignment.

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

  The default value is **false**.

- *policy_property_name*

  Defines the package property key to use for policy assignment.

  The default value is **packageId**.

- *mapping_table.<key>=<value>*

  A set of values (key,value) used to map the package information determined by the SOAP LEG and the package ID index that the SCA BB application uses.

Note Every policy name is preceded by the *mapping_table.* key.
For example:
```
mapping_table.PolicyLabel1=11
mapping_table.PolicyLabel2=12
```

The [SOAP.Policy Logging] section of the configuration file contains the following parameters:

- *log_missing_policy_name*

  Defines whether log messages will be issued when no policy was found.

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

  The default value is **false**.

- *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**.

Note Set the *log_all* parameter to **true only** when troubleshooting.

- *log_default_policy_assignment*

  Defines whether to write a user-log message for every assignment of the default value (as defined in *default_value*)

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

  The default value is **false**.

Package Association Example

Assuming that the package information appears inside labels TYPE and DOMAIN, configure the order of the labels for the policy name format as follows:

```
policy_name_format=TYPE,DOMAIN
```

Assuming that label TYPE (returned as a query reply) contains the type of package (gold, silver, or bronze) and label DOMAIN (passed as an input parameter) 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 package names as follows:

```
[SOAP.Policy.Package]
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 SOAP LEG received a query reply with the value 'gold' under the label “TYPE”, and the value 'domain1' was passed to the SOAP LEG by the SM core under the label “DOMAIN”, the package ID that will be associated to the subscriber in the SM will have the value 11.

The following is an example of the entire configuration file:

```
[SOAP.Policy Logging]
log_missing_policy_name=false
log_all=false
log_default_policy_assignment=false

[SOAP.Policy.Package]
policy_name_format=TYPE,DOMAIN
name_seperator_value=_
policy_property_name=packageId

# default package configuration
default_value=1
allow_login_with_no_policy=false

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

CHAPTER 4

Using the SOAP LEG Command-Line Utility (CLU)

This chapter contains the following sections:

- p3soap utility 4-1

p3soap utility

The SOAP LEG contains its own Command-Line Utility (CLU) commands, called *p3soap*, for retrieving information and statistics about the LEG.

The p3soap utility displays the LEG configuration and statistics. The command format is **p3soap** *<operation> [OPTIONS]*.

The following table lists the p3soap operations.

Table 4-1 p3soap Operations

Operation	Description
--show	Displays all of SOAP LEG configuration and status
--show-statistics	Displays statistics for the SOAP LEG including: failed queries, queries sent, queries received
--show-version	Displays the SOAP LEG version number
--set-username	Sets the username and password to enable secure queries via the SOAP communication protocol
--reset-username	Resets the username to cancel the secure queries

Table 4-2 p3soap User Options

User Option	Abbreviation	Description
--username=USER-NAME	-u	Specifies the name of the user. Used with the **--set-username** and **--reset-username** operations.
--password=USER-PASSWORD	-P	Specifies the password of the user. Used with the **--set-username** and **--reset-username** operations.

Table 4-3 p3soap Miscellaneous Options

Option	Abbreviation	Description
--remote=IP[:port]	-r	(Optional) Used with the **--set-username** and **--reset-username** operations to configure secure queries on the remote SM in High Availability setups. The Port option should be used if the PRPC Server port on the remove SM machine differs from the default value (14374).

Viewing the SOAP LEG Status

The following is an example of using the `p3soap` command-line utility with the `show` operation:

```
> p3soap --show
   SOAP LEG:
   =========
   Active:   true
   Url:      http://1.1.1.1:8080/services/ProvisioningServiceSoap.asmx
   Username: N/A
   Logging:
       Log all queries:    true
       Log failed queries: true
   Command terminated successfully
   >
```

Viewing the SOAP LEG Statistics

The following is an example of using the `p3soap` command line utility with the `show-statistics` operation:

```
> p3soap --show-statistics
   SOAP LEG statistics
   ===================
   Successful logins:          3
   Failed queries:             1
   Failed package association: 0
   Queries in process:         0
   Max-Concurrent queries:     0
   Command terminated successfully
   >
```

Viewing the SOAP LEG Version

The following is an example of using the `p3soap` command line utility with the `show-version` operation:

```
> p3soap --show-version
   SOAP LEG 3.0.5 Build 30
   Command terminated successfully
   >
```

Setting the username and password for Secure Requests

The following is an example of using the `p3soap` command line utility with the `set-username` operation:

```
> p3soap --set-username --username=cisco --password=cisco
   Command terminated successfully
   >
```

Resetting the username and password for Secure Requests

The following is an example of using the `p3soap` command line utility with the `reset-username` operation:

```
> p3soap --reset-username
   Command terminated successfully
   >
```

APPENDIX A

Cisco WSDL

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
        xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
        xmlns:s="http://www.w3.org/2001/XMLSchema"
        xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/"
        xmlns:tns="http://cisco.com/CiscoQuery"
        xmlns:tm="http://microsoft.com/wsdl/mime/textMatching/"
        xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
        targetNamespace="http://cisco.com/CiscoQuery"
        xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">

  <wsdl:types>
    <s:schema elementFormDefault="qualified"
    targetNamespace="http://cisco.com/CiscoQuery">

      <s:complexType name="ArrayOfString">
        <s:sequence>
          <s:element minOccurs="0" maxOccurs="unbounded" name="string"
nillable="true" type="s:string" />
        </s:sequence>
      </s:complexType>

      <s:element name="QuerySubscriberIn">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="subscriberId"
type="s:string"/>
            <s:element minOccurs="0" maxOccurs="1" name="mappings"
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="keys"
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="values"
type="tns:ArrayOfString"/>
          </s:sequence>
        </s:complexType>
      </s:element>

      <s:element name="QuerySubscriberOut">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="subscriberId"
type="s:string"/>
            <s:element minOccurs="0" maxOccurs="1" name="mappings"
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="propertiesKeys"
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="propertiesValues"
```

```
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="keys"
type="tns:ArrayOfString"/>
            <s:element minOccurs="0" maxOccurs="1" name="values"
type="tns:ArrayOfString"/>
          </s:sequence>
        </s:complexType>
      </s:element>

    </s:schema>
  </wsdl:types>

  <wsdl:message name="QuerySubscriberSoapIn">
    <wsdl:part name="parameters" element="tns:QuerySubscriberIn" />
  </wsdl:message>
  <wsdl:message name="QuerySubscriberSoapOut">
    <wsdl:part name="parameters" element="tns:QuerySubscriberOut" />
  </wsdl:message>

  <wsdl:portType name="QueryServiceSoap">
    <wsdl:operation name="QuerySubscriber">
      <wsdl:input message="tns:QuerySubscriberSoapIn" />
      <wsdl:output message="tns:QuerySubscriberSoapOut" />
    </wsdl:operation>
  </wsdl:portType>

  <wsdl:binding name="QueryServiceSoap" type="tns:QueryServiceSoap">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http"
style="document" />

    <wsdl:operation name="QuerySubscriber">
      <soap:operation
soapAction="http://cisco.com/CiscoQuery/QuerySubscriber" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>

  <wsdl:service name="QueryService">
    <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Queries
subscribers data</documentation>
    <wsdl:port name="QueryServiceSoap" binding="tns:QueryServiceSoap">
      <soap:address
location="http://localhost:8080/axis/services/QueryServiceSoap" />
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

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