CPS CCI Guide for Full Privilege Administrators, Release 18.4.0 (Restricted Release)

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About This Guide

This document is a part of the Cisco Policy Suite documentation set.

For information about available documentation, see the *CPS Documentation Map* for this release at Cisco.com.

Audience

This guide is best used by these readers:

- Network administrators
- Network engineers
- Network operators
- System administrators

This document assumes a general understanding of network architecture, configuration, and operations.

Additional Support

For further documentation and support:

- Contact your Cisco Systems, Inc. technical representative.
- Call the Cisco Systems, Inc. technical support number.
- Write to Cisco Systems, Inc. at support@cisco.com.

- Refer to support matrix at https://www.cisco.com/c/en/us/support/index.html and to other documents related to Cisco Policy Suite.

Conventions (all documentation)

This document uses the following conventions.

Conventions	**Indication**
bold font	Commands and keywords and user-entered text appear in **bold** font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z }	Required 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.
courier font	Terminal sessions and information the system displays appear in courier 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 material not covered in the manual.

Caution Means reader be careful. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning IMPORTANT SAFETY INSTRUCTIONS.

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Note Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see What's New in Cisco Product Documentation.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the . RSS feeds are a free service.

Important Notes

Important Any feature or GUI functionality that is not documented may not be supported in this release or may be customer specific, and must not be used without consulting your Cisco Account representative.

RESTRICTED RELEASE

Important This is a Short Term Support (STS) release with availability and use restrictions. Contact your Cisco Account or Support representatives for more information.

CHAPTER 1

Control Center Interface

- Control Center Overview, on page 1
- Control Center Users And Roles, on page 1
- Access Control Center, on page 1

Control Center Overview

The Control Center enables you to manage subscribers and perform various operations to get information about subscribers, track subscriber sessions, to construct and populate custom reference data tables and so on.

Control Center Users And Roles

CPS enables users to be aware of its current privileges while accessing Control Center as described below:

- If a user has read-write privilege then "ADMIN" is displayed adjacent to user name in the GUI.
- If a user has read-only privilege then "READONLY" is displayed adjacent to user name in the GUI.

Access Control Center

To access Control Center, use the following URL:

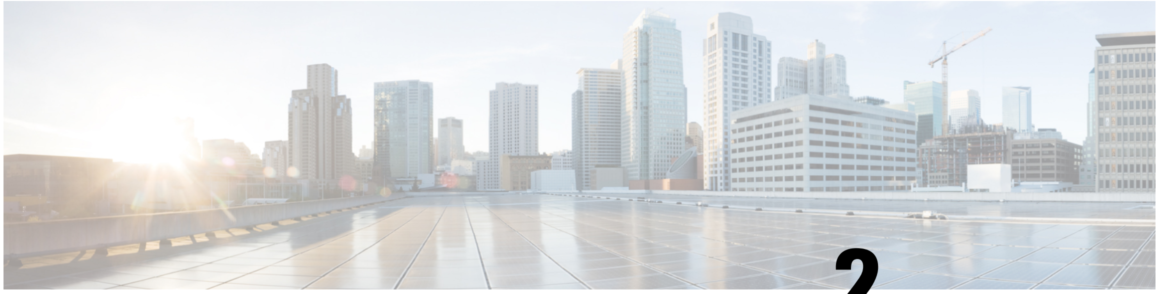
http://<*ip-address*>:8090

The hostname is displayed in the login dialog box and system banner to differentiate between open windows while performing any operation of the CPS system. It indicates which system is being modified and prevents any errors or misconfigurations.

The hostname is displayed when the parameter `-Dhostname=lab` is configured in pb/qns.conf files. If it is not configured in the qns.conf file, it is displayed as a result of the command "hostname" on the server.

The hostname is displayed in the login panel only when the following argument is set to true:

```
-DshowSitenameLogin
```



CHAPTER 2

Subscriber Screens

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- Find a Subscriber, on page 3
- Create a Subscriber, on page 4
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- Subscriber Screens Definitions, on page 8
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Subscriber Screens Overview

This chapter provides discussion and examples for an administrator with full read and write privileges. As a full privilege admin, you are able to change, delete, and deactivate subscriber information.

After you log in, the default page of the Control Center interface displays the **Subscribers tab** > **Find Subscriber** screen.

The Subscribers tab lets you look at details for a subscriber, any subaccounts under a subscriber, and any sessions a subscriber may have.

From the menu tree on the left, you have access to session information screens at the subscriber level and the network level. Read about these screens in Sessions Screen, on page 20.

Find a Subscriber

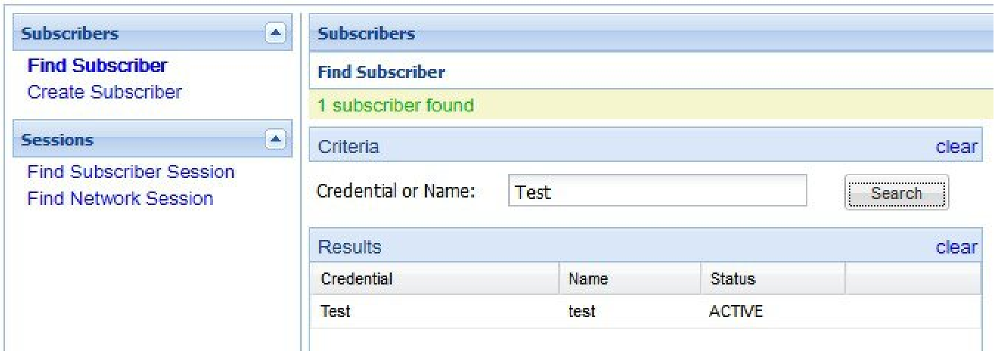
Finding a subscriber is often the first step in performing other tasks for a subscriber.

Note To list all subscribers, leave the Credential Name field blank. The maximum number of records returned is 1000.

Enter search criteria into either the Credential or Name field. You can use any portion of a subscriber's name, but when searching on a credential ID, you must use the full credential. No wild cards are permitted.

Step 1 Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.

Step 2 Enter your search criteria in the Credential or Name field and click **Search**.


Subscribers
Find Subscriber
Create Subscriber
Sessions
Find Subscriber Session
Find Network Session
Subscribers
Find Subscriber
Criteria
clear
Search
Results
clear

1 subscriber found

Credential or Name: Test

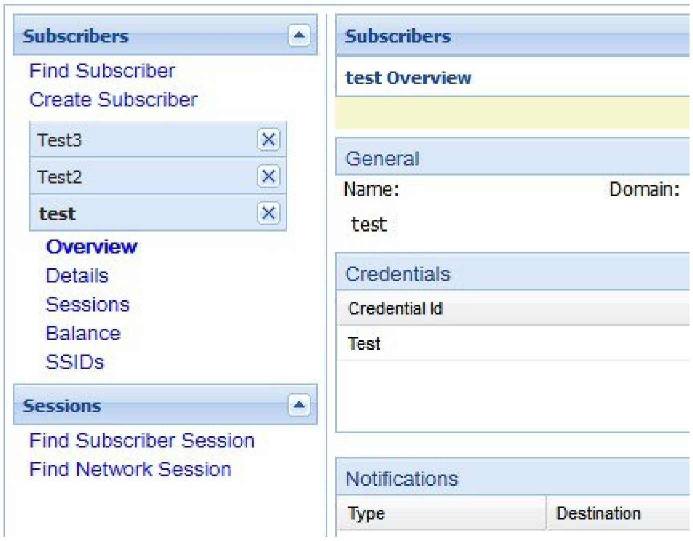
Credential	Name	Status
Test	test	ACTIVE

Step 3 Matches to your search criteria appear in the Results table.

Use the open link on the right to display more information about the subscriber

Use the delete link to delete the subscriber.

Note As you find and use subscriber screens, the menu tree keeps track of the most recent finds. Dismiss these items from the tree with the X icon.


Subscribers
Find Subscriber
Create Subscriber
Test3
Test2
test
Overview
Details
Sessions
Balance
SSIDs
Sessions
Find Subscriber Session
Find Network Session
Subscribers
test Overview
General
Credentials
Notifications

Name: test

Domain:

Credential Id
Test

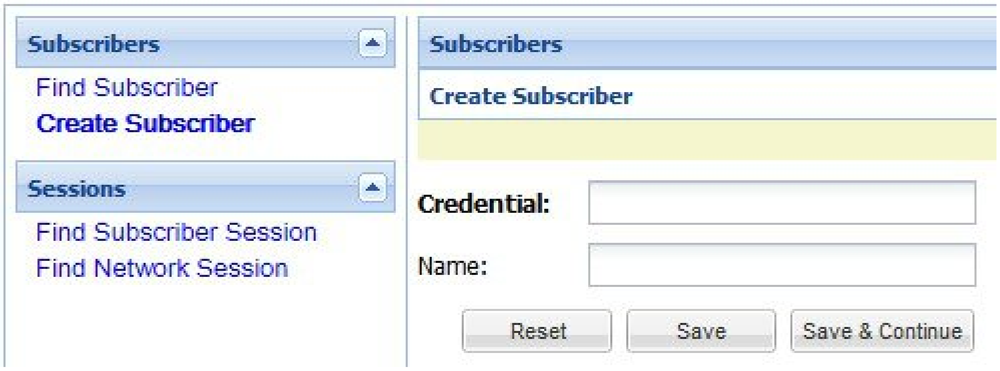
Type	Destination

Create a Subscriber

To import a large number of subscribers, use your own subscriber profile repository (SPR) software.

Use these steps to create subscribers one at a time.

Step 1 Click **Subscribers tab** > **Subscribers node** > **Create Subscriber** item in the menu tree.



Step 2 Select a Domain from the drop-down menu.

Domains are created in the Policy Builder interface and are displayed here. Domains are a point of intersection between Control Center and Policy Builder.

Step 3 Type in a credential that specifically identifies the new subscriber.

A credential is a unique identifier that subscribers and subaccount customers use to log in. Typically, a credential is defined when you create the subscriber or subaccount. However, you can manage credentials separately from the create process.

The credential can be any letter or number with a length of one or more alphanumeric characters. Best practice is to not use special characters, although apostrophe and hyphen may be part of a name.

Step 4 Enter the subscriber's name, first and last, in the same field.

Step 5 Click **Save** to create the subscriber with just a domain, name, and credential defined. You can return later and fill in more details later.

Click **Save and Continue** to provide more details of the new subscriber at this time.

The details of a subscriber are captured and displayed on the screens. To fill out the various detail screens, see those specific sections.

- General
- Credentials
- Services
- Notifications
- Subaccounts

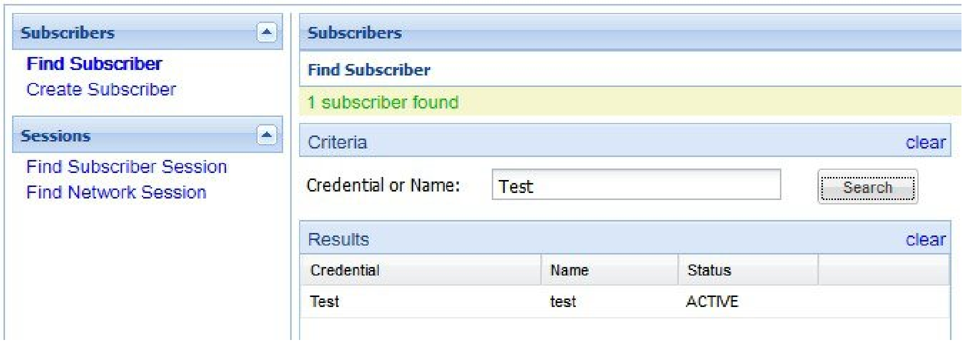
The other two areas, Sessions and Balance, show you more information about the user, but there is nothing editable.

If you want to check your work, use the Find Subscriber task in the menu tree and make sure you can find the subscriber you just created.

Edit a Subscriber

Step 1 Find the subscriber as described at Find a Subscriber, on page 3.

Step 2 Hover over the name displayed in the Results table and click **Open**.

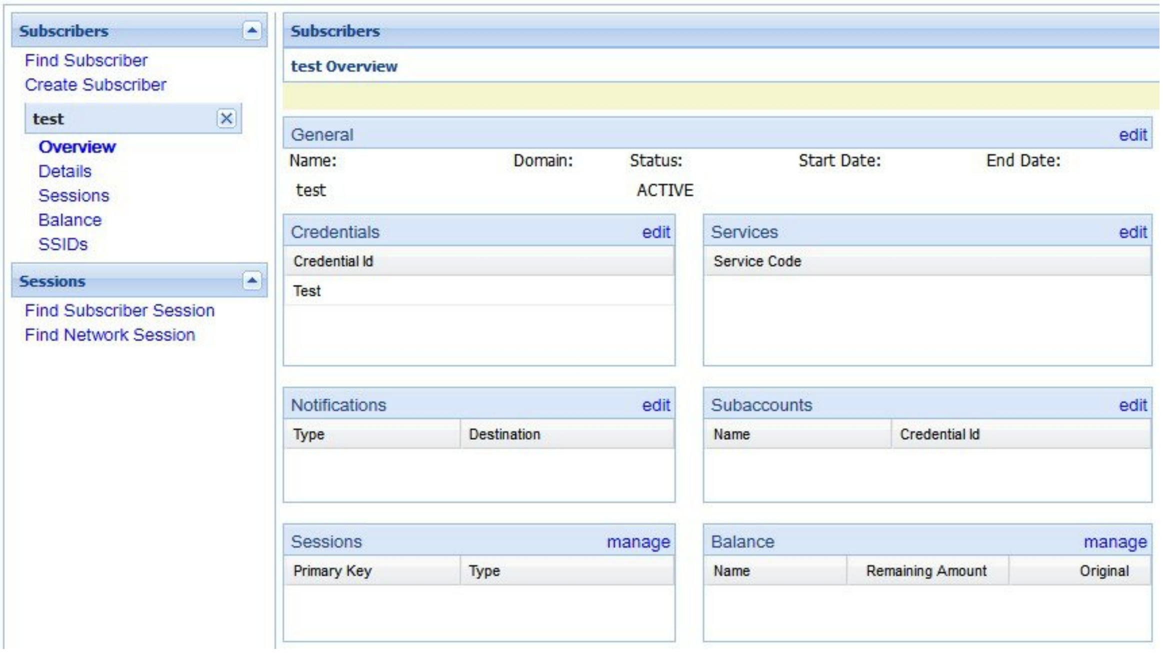

Subscribers
Find Subscriber
Create Subscriber
Sessions
Find Subscriber Session
Find Network Session
Subscribers
Find Subscriber
Criteria
clear
Search
Results
clear

1 subscriber found

Credential or Name: Test

Credential	Name	Status	
Test	test	ACTIVE	

The Subscriber Overview screen appears.


Subscribers
Find Subscriber
Create Subscriber
test
Overview
Details
Sessions
Balance
SSIDs
Sessions
Find Subscriber Session
Find Network Session
Subscribers
test Overview
General
edit
Credentials
edit
Services
edit
Notifications
edit
Subaccounts
edit
Sessions
manage
Balance
manage

Name:	Domain:	Status:	Start Date:	End Date:
test		ACTIVE		

Credential Id
Test

Service Code

Type	Destination

Name	Credential Id

Primary Key	Type

Name	Remaining Amount	Original

Step 3 From this screen, click any of the edit or manage links to change subscriber information about that topic.

You can also use the menu items in the menu tree on the left to display individual screens.

For help on using any of the screens shown here, see the sections written specifically about them:

1. Overview Screen
2. Details Screens
3. General Screen

4. Credentials Screen
5. Services Screen
6. Notifications Screen
7. Subaccount Screen
8. Sessions Screen
9. Balance Screen

Change the Credential ID of a Subscriber

Step 1 Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the tree.

Step 2 Enter search criteria for the subscriber in the **Find Subscriber** screen.

Step 3 Hover over the subscriber in the Results list and click the open link.

Step 4 In the Credentials area, click the edit link.

Step 5 Either add a new credential or edit one already present.

- To add an additional credential to the list, click the add link.
- To edit a credential already in the list, hover over the credential and click **edit**.

In the **Credential Detail** screen that appears, set the expiration date for the credential, or add or change an optional password to the credential.

See also the Credentials Screen. That screen contains the fields for a secondary password for the subscriber.

Deactivating or Activating a Subscriber

Deactivate a subscriber if you don't want to completely delete them from your subscriber base. This way you can reactivate them later.

Step 1 Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.

Find the subscriber as described on Find a Subscriber.

Step 2 On the Overview screen, click the edit link in the General area.

Step 3 In the Status drop-down menu, change the subscriber's status to Suspended or Active.

Delete a Subscriber

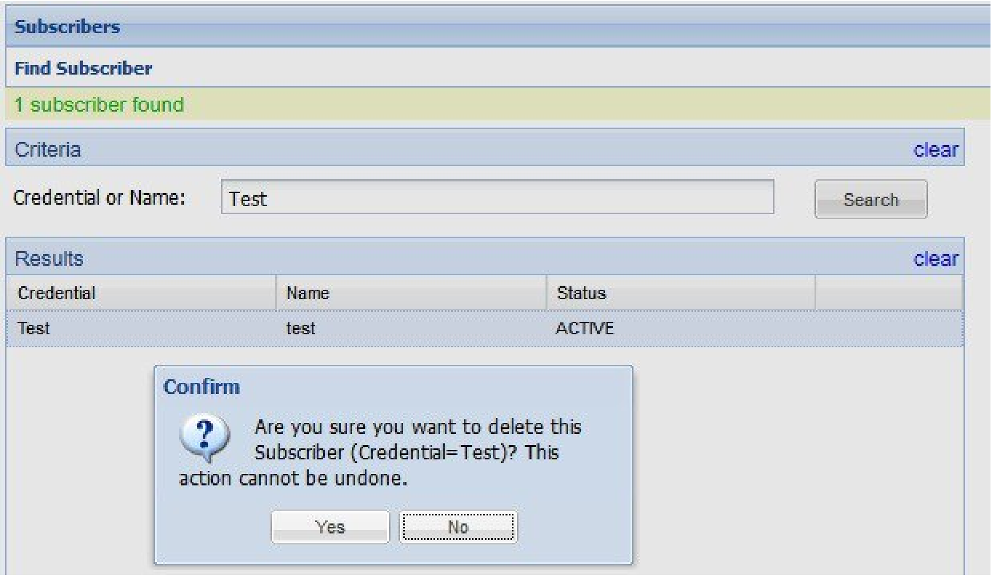
If deleting a subscriber is too drastic, you can deactivate them with the procedure on Deactivating or Activating a Subscriber, on page 7.

Step 1 Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.

Find the subscriber as described on Find a Subscriber.

Step 2 Hover over the subscriber in the Results table and click **Delete**.

Step 3 Be sure you are deleting the correct subscriber. Check the credential in the Confirm screen and make sure.



1 subscriber found

Credential or Name: Test

Credential	Name	Status	
Test	test	ACTIVE	

Are you sure you want to delete this Subscriber (Credential=Test)? This action cannot be undone.

The Results table displays your matches, but without the deleted subscriber.

Subscriber Screens Definitions

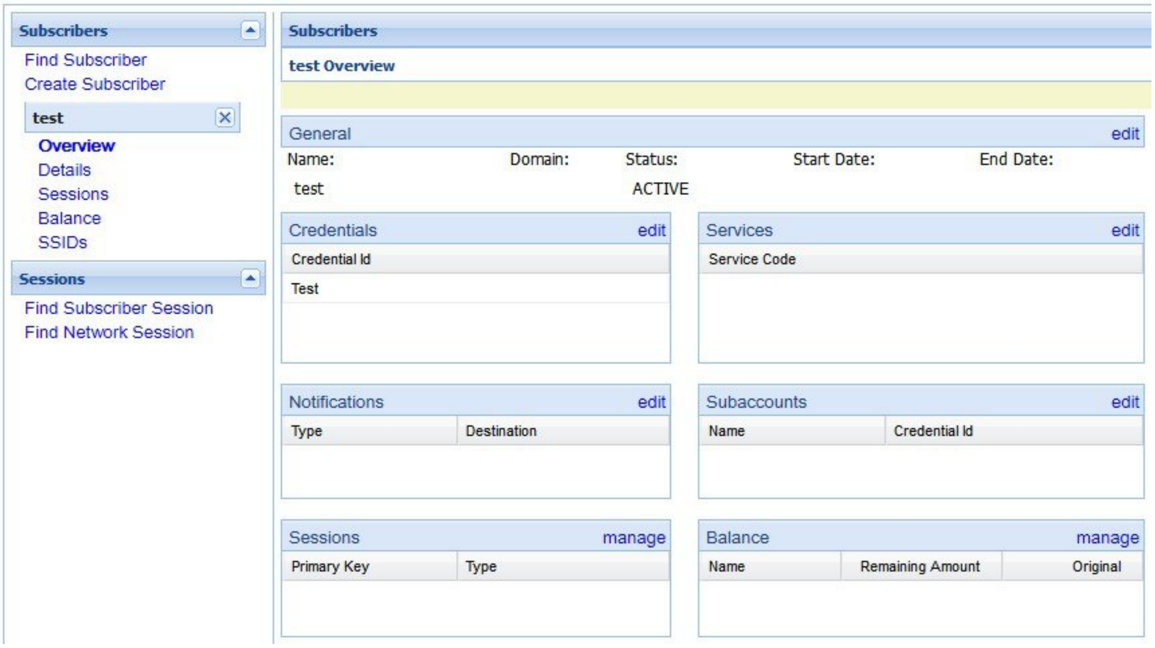
This section describes the screens used to support subscribers. After you find a subscriber you can access these screens.

Overview Screen

When you find a subscriber and open their record, the Overview screen opens.

The menu tree on the left displays the subscriber name and four submenus (Overview, Details, Sessions, Balance).

The Overview screen, with its six subsections, appears on the right.


Subscribers
Find Subscriber
Create Subscriber
test
Overview
Details
Sessions
Balance
SSIDs
Sessions
Find Subscriber Session
Find Network Session
Subscribers
test Overview
General
edit
Credentials
edit
Services
edit
Service Code
Notifications
edit
Type
Destination
Subaccounts
edit
Name
Credential Id
Sessions
manage
Primary Key
Type
Balance
manage
Name
Remaining Amount
Original

Name: test
Domain:
Status: ACTIVE
Start Date:
End Date:

Credential Id: Test

Click the edit or manage links at the right of the sections to add, edit, or remove information for that specific aspect of the subscriber. Refer to Edit a Subscriber, on page 6 for more information.

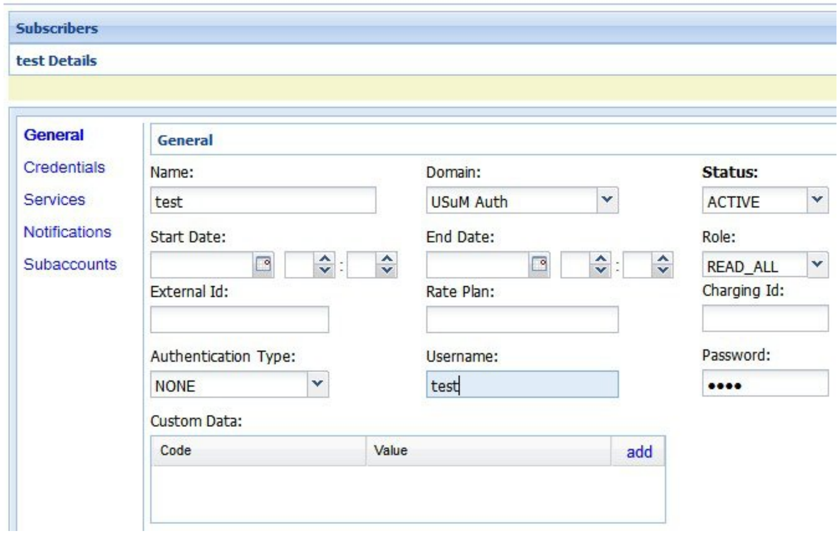
Details Screens

The Details item in the menu lets you view and edit five other screens that contain even more specific information about a subscriber or a subaccount:

- General information
- Credentials or passwords
- Services the subscriber pays for
- Notification preferences
- Subaccount users under the subscriber

General Screen

1. Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.
2. Find the subscriber as described in Find a Subscriber, on page 3.
3. Click **Details** > **General**.


Subscribers
test Details
General
Credentials
Services
Notifications
Subaccounts
General
Start Date:
End Date:
External Id:
Rate Plan:
Charging Id:
Custom Data:
Code
Value
add

Name: test

Domain: USuM Auth

Status: ACTIVE

Role: READ_ALL

Authentication Type: NONE

Username: test

Password: ••••

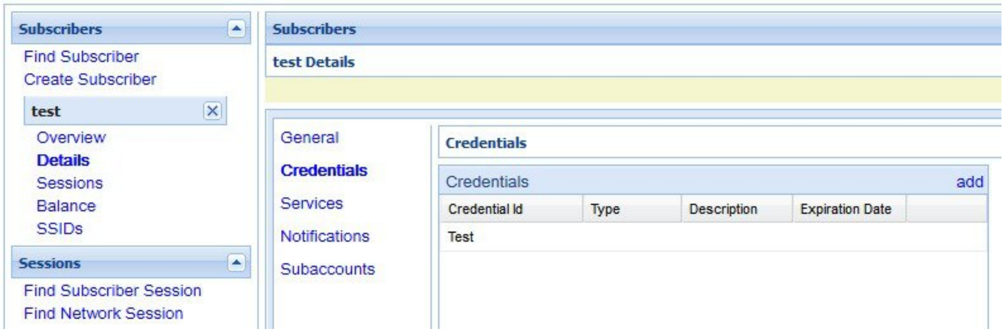
Field	Description
Name	This single field is for both the first and last name of the subscriber.
Domain	This drop-down list displays the domain to which the subscriber is assigned. Domains themselves are created in the Policy Builder interface.
Status	The Status field shows these three states for a subscriber: • Active and able to use services • Deleted and no longer part of your system • Suspended and in the system, but not able to use services By default, status for a new subscriber is always ACTIVE, but you can change this.
Start Date End Date	Use the calendar widget to specify the start and stop date and time of service to the subscriber.

Field	Description
Role	When the subscriber logs in to your subscriber portal, this field determines how much read-write privilege is granted to them. The primary subscriber is always granted the Write All role, permitting editing of all subaccounts under it. You can change this role if you wish. For example, the primary subscriber might be a team leader responsible for team member accounts. See Subaccount Screen. If a user is not a primary subscriber, they are created as a subaccount user under a primary subscriber. Assign roles for subaccount users in the Details > Subaccounts screen. Be sure to assign the access privileges of a subaccount user. When first created, they have Write all privileges. • Write all—can read and write all information for themselves and any subaccounts • Read all—can view all portal information • Write self—can read and write only their own information • Read self—can view only their own information
External ID	Occasionally, a subscriber may need to connect with or relate to an external third-party system. This field identifies the subscriber to that external service.
Rate Plan	Enter predefined rate plan codes, such as prepaid or postpaid. Rate plans are created in Policy Builder and are obtained from that administrator.
Charging ID	A subscriber might have a unique charging ID. Using this, usage by members of a subaccount, or ’children’ of the subscriber can be billed to their ’parent’.
Authentication Type	Not used.
Username	This field is used to provision the EAP username in the subscriber profile. This field is provided to support the EAP-TTLS/MSCHAPv2 call flow introduced in the CPS 7.5 release.
Password	This field is used to provision the EAP password in the subscriber profile. This field is used together with the Username field.

Field	Description
Custom Data Area	This area lets you use a look up list, or key-value pairs to keep track of other variables that concern your subscriber.
Code	This is the key portion of a key-value pair.
Value	This is the definition or value of the key-value pair.

Credentials Screen

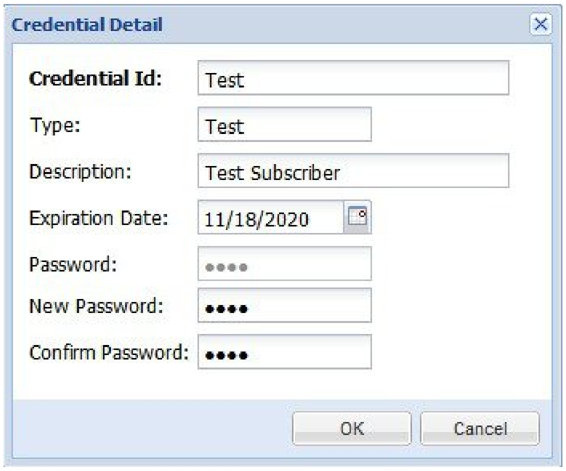
The Credentials screen lets you specify more than one credential or password for a subscriber. More than one credential may be necessary for the subscriber to log in from different devices or locations.


Subscribers
Find Subscriber
Create Subscriber
test
Overview
Details
Sessions
Balance
SSIDs
Sessions
Find Subscriber Session
Find Network Session
Subscribers
test Details
General
Credentials
Services
Notifications
Subaccounts
Credentials
Credentials
add

Credential Id	Type	Description	Expiration Date
Test			

The rows in this screen are populated by the Credential Detail screen shown below.

Click the add or edit link to display the Credential Detail screen.


Credential Detail

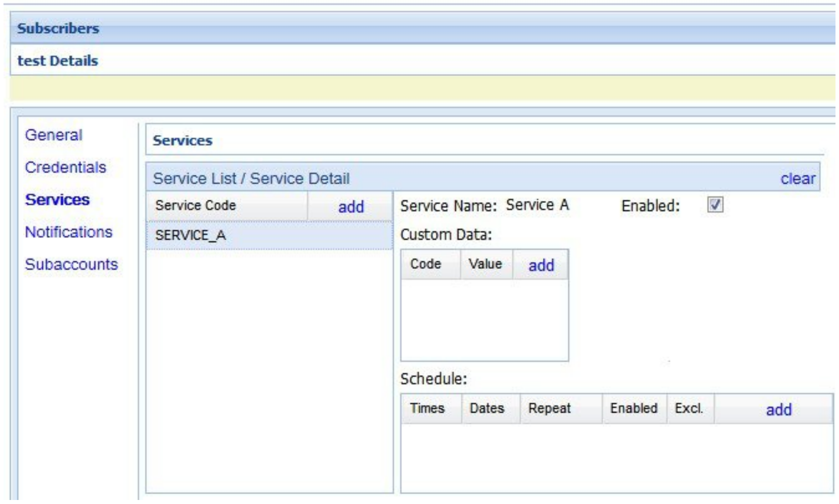
Credential Id:	Test
Type:	Test
Description:	Test Subscriber
Expiration Date:	11/18/2020
Password:	••••
New Password:	••••
Confirm Password:	••••

OK
Cancel

Field	Description
Credential ID	A credential is a unique identifier that subscribers and subaccount customers use to log in. Typically, a credential is defined when you create the subscriber or subaccount. However, you can manage credentials separately from the create process. The credential can be any letter or number with a length of one or more alphanumeric characters. Best practice is to not use special characters, although apostrophe and hyphen may be part of a name.
Type	Use this field for sorting and reporting. In this field, you can indicate if the credential is for a subscriber or a subaccount, or for permanent or guest use.
Description	This field lets you provide more information about this particular credential.
Expiration Date	Uses the calendar widget to set an end date to the credential and so restrict logins.
Password	In addition to a credential ID, a subscriber can log in with a password. A password is optional because MAC addresses, for example, do not have a password.
New Password	Change the password already defined.
Confirm Password	This entry must match the new password.

Services Screen

The Services link lets you administer what services or service plans a subscriber may access.


Subscribers
test Details
General
Credentials
Services
Notifications
Subaccounts
Services
Service List / Service Detail
clear
Service Code
add
Custom Data:
Code
Value
add
Schedule:
Times
Dates
Repeat
Enabled
Excl.
add

SERVICE_A

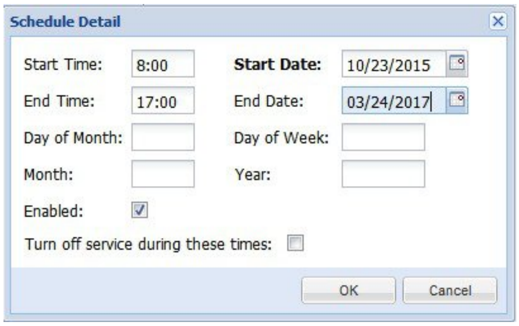
Service Name: Service A

Enabled: ☑

The Services screen shows this information about the service provided to the subscriber. Recall that a subscriber can have one or more services.

Services and service plans are developed in Policy Builder and are reflected here for you to choose from.

Services are a point of intersection between Control Center and Policy Builder.

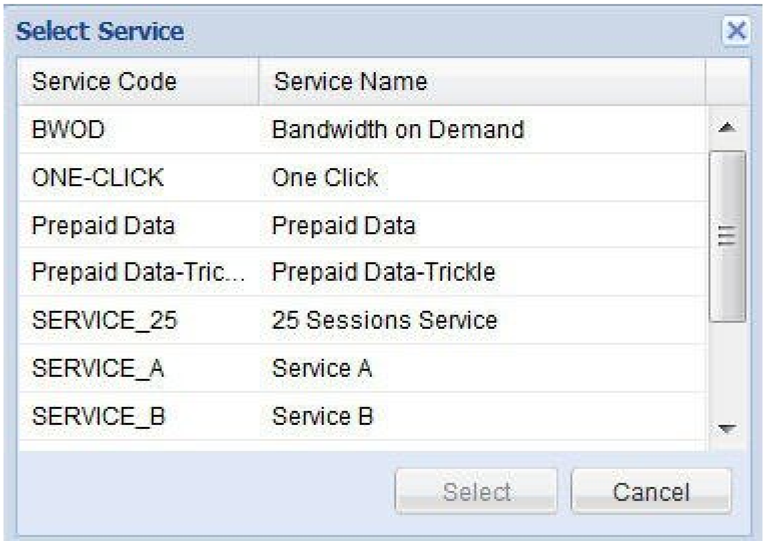
Field	**Description**
Service Name	Enter the name or code of the service.
Enabled	If checked, this box allows the subscriber to use the service. Unchecked, the subscriber cannot access the service.
Custom Data	This area lets you use a look up list, or key-value pairs to keep track of other variables that concern your service.
Code	This is the key portion of a key-value pair.
Value	This is the definition or value of the key.
Schedule	This area lets you define specific times and recurrence for when the service is available to the subscriber. Click the add link to fill in the Schedule Detail window.  Schedule Detail Start Time: 8:00 Start Date: 10/23/2015 End Time: 17:00 End Date: 03/24/2017 Day of Month: Day of Week: Month: Year: Enabled: ☑ Turn off service during these times: ☐
Start Time End Time	These two fields let you limit the hours of the day your subscriber may access your system. The example shows access times from 8:00 in the morning to 5:00 in the afternoon. Conversely, if you check the Turn off service during these times check box, you prevent access during the times specified here.
Dates	Set dates to limit subscriber access on a wider basis.
Start Date End Date	Use the calendar widget to set a specific start and end date to service. Conversely, check the Turn off service during these times check box and prevent access during the dates specified here.

Field	Description
Day of month	Select a day of the month to permit the subscriber to access this service. If you want, you can allow access on the 5th, 10th, and 30th of the month by creating three schedules. Conversely, check the Turn off service during these time check box to deny access to a service on a particular day of the month.
Day of Week	Select the day of the week to permit the subscriber to access this service. You can allow access on only Tuesday, Wednesday, and Thursday by creating three schedules specifying those days of the week. For another example, you might create two schedules, one for Saturday and one for Sunday. If you check the Turn off service during these times check box for both schedules, you prevent access on weekends specifically.
Month	Select a month that you would like to allow service, perhaps for an introductory offer. Services is granted for that calendar month only. To affect more than one month, create multiple schedules, that is, one for June, one for July, one for August and so on. Conversely, check the Turn off service during these times check box to deny access to a service for a particular month, perhaps during vacation period.
Year	Grant service for an entire calendar year. To affect more than one year, create multiple schedules, that is, one for 2014, 2015, and so on. Conversely, check the Turn off service during these times check box to deny access to a service for a particular year.
Repeat	This field interprets the Schedule detail, showing if the schedule has a recurring aspect.
Enabled	Select this check box to put the schedule into effect. If you are developing a schedule and don’t want to invoke it yet, deselect this box. This selection is reflected on the Service Detail screen as a Yes or No in the Enabled column.
Turn off service during these times	Select this check box to make the scheduled time unavailable for login, that is, to create and excluded time. For example, you may want to block a subscriber from logging in during school time hours. This selection is reflected on the Service Detail screen as a Yes or No in the Excl column.

Add a Service to a Subscriber

Step 1 To add a service to a subscriber, click **Subscribers tab** > **Find Subscriber** > **Open** > **Details (in the tree)** > **Services (next to the form)** > **add (next to the Service Code column heading)**.

Step 2 Choose a service from the **Select Service** window.



Service Code	Service Name
BWOD	Bandwidth on Demand
ONE-CLICK	One Click
Prepaid Data	Prepaid Data
Prepaid Data-Tric...	Prepaid Data-Trickle
SERVICE_25	25 Sessions Service
SERVICE_A	Service A
SERVICE_B	Service B

Step 3 Click the **Select** button.

Services already provisioned to a subscriber are grayed out and you cannot select them again.

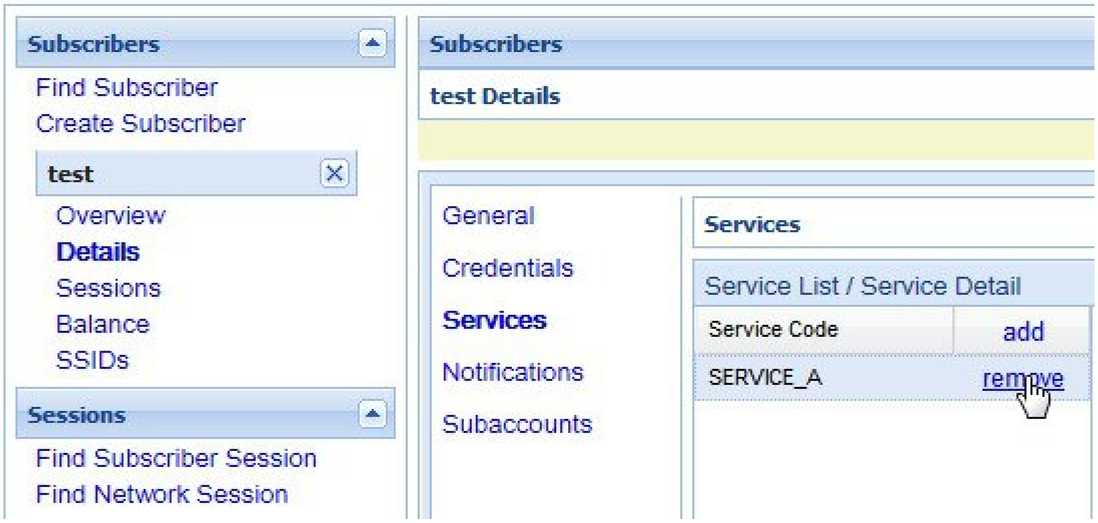
Step 4 Check that the new service is listed under the Service List area on the Subscriber screen.

Remove a Service from a Subscriber

Step 1 Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.

Step 2 In the Services area of the Overview screen, click the edit link.

Step 3 In the Service Code list on the left, click the remove link.


Subscribers
Find Subscriber
Create Subscriber
test
Overview
Details
Sessions
Balance
SSIDs
Sessions
Find Subscriber Session
Find Network Session
Subscribers
test Details
General
Credentials
Services
Notifications
Subaccounts
Services
Service List / Service Detail
Service Code
add
SERVICE_A
remove

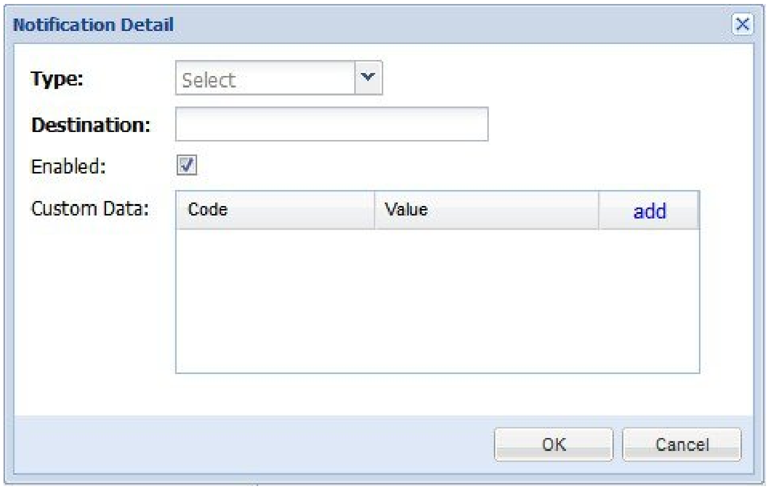
Notifications Screen

The Notifications screen lets you specify how to contact your subscriber for system messages or for special promotions, for example. You can notify subscribers by these methods.

- XML
- Email
- SMS
- Apple iPhone push

Note Notifications must be set up in Policy Builder prior to using this screen.

1. Click **Subscriber tab** > **Subscribers tree** > **find a subscriber** > **Details** > **Notifications**.
2. Click the add link at the top.
3. Fill in the Notification Detail screen.



Field	Description
Type	Contact your subscriber with one of these methods in the drop-down menu: • Real time / XML • SMS • Email • Apple iPhone push
Destination	Specify the address for the notification. For an XML message, provide URLs. For an SMS message, provide the destination number, perhaps 555544444. For an email notification, provide an email address. For an Apple iPhone push, provide the server gateway, server port, and certificate and certificate password.
Enabled	Click this check box to allow notifications to go through, or uncheck it if you are still developing the message.
Custom Data Area	This area lets you use a look up list, or key-value pairs and so keep track of other variables that concern your subscriber.
Code	This is the key portion of a key-value pair.
Value	This is the definition or value of the key.

Subaccount Screen

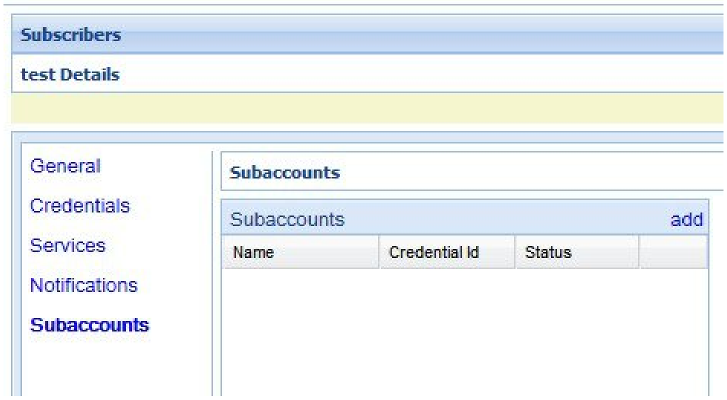
You may be asked to create a subaccount under a primary subscriber so that the primary subscriber has authority over others, perhaps team members or family members. This construct forces a subaccount’s login to count against the bill of the main subscriber.

For example, if the primary subscriber has a Charging ID of 123456, assign the subaccount users the same charging ID.

Note Currently, there is no method to move a primary subscriber to become a subaccount of a different subscriber. You must delete and then recreate such a subscriber.

---

1. Click **Subscribers tab** > **Subscribers node** > **Find Subscriber** item in the menu tree.
2. Find the primary subscriber, the person responsible for the subaccount.
3. Click **Details** > **Subaccounts** and click the add link in the corner.


Subscribers
test Details
General
Credentials
Services
Notifications
Subaccounts
Subaccounts
Subaccounts
add
Name
Credential Id
Status

The detail screen appears as when creating a primary subscriber. See these sections if you need help in filling out those screens.

- General Screen
- Credentials Screen
- Services Screen
- Notifications Screen

Note You cannot make another subaccount under the current subaccount. You can only provision subaccounts under a primary subscriber.

Sessions Screen

The Sessions item in the menu tree under a subscriber lets you see the sessions the subscriber has running. That is, find the subscriber first, and then check their sessions. A subscriber may have several sessions up, perhaps from different devices.

You can display a Sessions screen two ways:

- Find the subscriber and then view all their sessions:

  Subscribers tab > **Subscriber node** > **Subscriber item** > **Overview screen** > **Sessions area** > **manage**

  See Viewing a Subscriber Session.

- Find all sessions on the network and then look for a subscriber:

  Subscribers tab > **Subscriber node** > **Subscriber Sessions item** > **Current Sessions table** > **open**

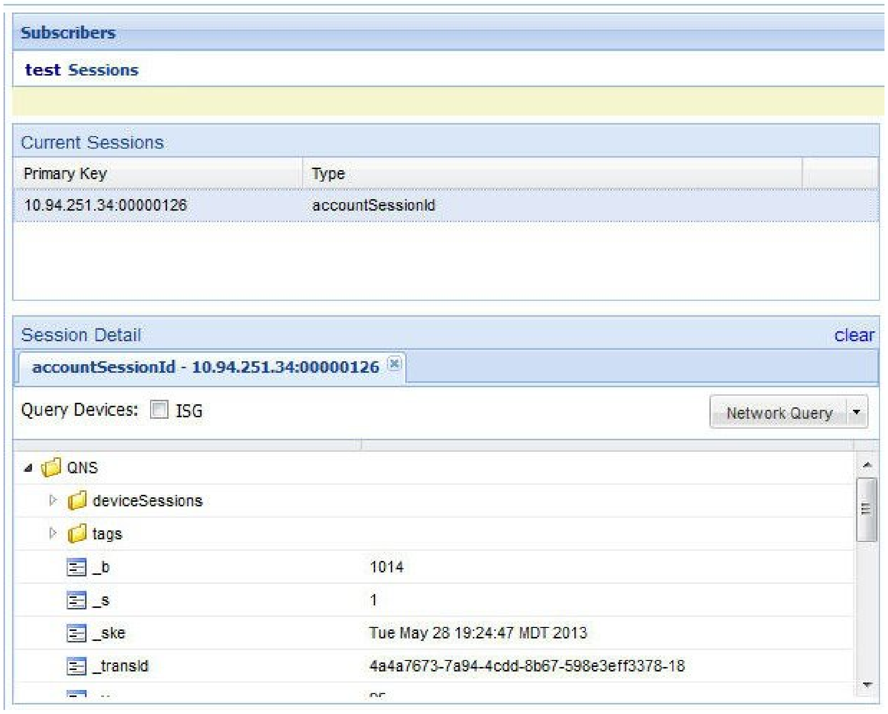
  See Finding Network Sessions.

Note If you would like a utility to start artificial sessions, contact your Cisco technical representative.

Session Details Table

The Session Detail table contains information about the session, including a Remove Session link.

An example of a Session Detail is shown below.



Primary Key	Type
10.94.251.34:00000126	accountSessionId

accountSessionId - 10.94.251.34:00000126

Query Devices: ☐ ISG

_b	1014
_s	1
_ske	Tue May 28 19:24:47 MDT 2013
_transId	4a4a7673-7a94-4cdd-8b67-598e3eff3378-18

Field	Description
Session Tabs	At the top, a tab exists for each session the subscriber has running. The example has one tab, the subscriber has one session up.
Query Devices	This check box lets you filter the session information below to one or more devices.
Network Query	This drop-down list lets you show details for only the devices you can provide IP addresses and secrets for, and so limits the data returned by the detail table.

The Policy Server folder has several subfolders to organize the session data.

Remove a Session

There are several ways to find a session and then remove it.

- Subscribers tab > Subscriber node > Find a subscriber > subscriber Sessions item > Remove Session link
- Subscribers tab > Subscriber node > Find a subscriber > Overview screen Sessions area > manage link > Remove Session link
- Subscribers tab > Sessions node > Find Subscriber session > open link > Remove Session link

Removing a session affects Cisco Policy Suite only, but other PEPs may be notified. Removing a session drops a subscriber and force them to log in again. If a subscriber reports that they cannot log in, check to see if there is a stuck session and remove it. If the system is experiencing performance troubles, dropping stuck sessions may help.

Balance Screen

The Balance item in the tree under a subscriber name provides a way to set balance amounts and quota amounts for the subscriber.

A subscriber can have several balance codes in place, and under each one, the subscriber can have several quota codes.

Balance codes and quota codes are developed and maintained in the Policy Builder interface. Control Center reflects that configuration.

Balances

Balances are of these types:

- Recurring—recurring balances automatically replenish on a configured cycle, for example daily, weekly, monthly, or per billing cycle. Any remaining balance is not carried over when the balance is reset.
    - Roll Over—a type of recurring balance. Roll over balances, which are additive, are similar to recurring balances, but any remaining balance is kept when the balance replenishes.

- One-time—one-time balances do not automatically replenish. One-time balances may be configured with an expiration date.
    - Top Up—a type of One-time balance. Top ups add to a subscriber's balance and may be applied to any of the above balance types. Top ups are differentiated from the balance to which they are applied, enabling the service provider to define the order in which top ups, and the underlying balance, is consumed. Top ups may be assigned an expiration date.

Balances can be configured to be automatically allocated for a subscriber during a balance reserve activity if a balance does not already exist. The fair use balances for new subscribers is an example. Auto-provisioned balances are created based on rules configured by the service provider, which may refer to parameters such as subscriber class, rate plan, and so on, when provisioning the balance.

Quotas

Quota may be either of two types, one-time or recurring.

One-time quotas are amounts of time use or data use that occur only one time and are not renewed. For example:

- If an ISP provider gives free introductory minutes
- If data bandwidth is provided on a tiered system, with the first 100 KB free, and then payment begins
- For a prepaid card use case

Recurring quota are those services the account subscriber signs up for and gets refreshed at some recurring period.

Managing Quotas and Balances

Balance codes and quota codes are developed and maintained in the Policy Builder interface for these drop-down lists.

In the data hierarchy, Balances contain Quota. If you delete information at the balance level, all the quotas underneath it are removed.

Step 1 In the menu, click Subscribers tab > Subscribers node > Find Subscriber.

Step 2 Open a subscriber record.

Step 3 Select the Balance item in the menu tree under the subscriber.

Step 4 Click the plus sign by the balance code name, to open the full view to the balances.

Step 5 Click a Credit link to apply more quotas or balance amounts for the subscriber.

Step 6 Use the date picker and time picker fields to change the start and expiration of a credit. Originally a credit amount is provided for you, but you can increase or decrease the amount you want to credit the balance using the date and time picker fields.

Step 7 When the credit data are correct, click apply credit.

Step 8 Wait for a screen refresh, and then review the new Balance chart. Be sure that your changes are in effect.

Add a Balance Type

A subscriber may have one or any number of balances available all at the same time. For example:

- A one-time introductory balance for a promotion
- A regular recurring balance that gets refreshed on a certain date
- A time-limited or data-limited balance that is tracked

Step 1 To add another type of quota for the subscriber's use, click the add link located just below the Last refresh message.

Step 2 Fill in the fields in the Add Balance window using the drop-down lists and calendar widgets.

Step 3 Select a balance and quota code and enter the amount you want to give the subscriber.

Note Recall that balance codes and quota codes are developed and maintained in the Policy Builder interface for these drop-down lists.

Credit or Debit an Existing Balance

Sometimes a subscriber's balance may need to be adjusted up or down.

Step 1 To adjust a balance, open the balance information with the plus sign.

Step 2 Then click either credit or debit links on the right. The credit link lets you specify an amount of credit and also a start and expiration date for when it may be used.

If you select to debit a balance, you are only prompted for the amount.

Step 3 Fill in the field for debit or credit amount. The remaining quota is calculated.

Delete a Balance

If you need to completely remove a specific balance type and all of its quota types from a subscriber, click the red circle/white dash icon.

This may be done during testing scenarios, but with real subscribers, another solution might be to simply debit balance until the balance approaches zero.

Delete a Quota

A quota is a part of an overall balance. You can delete any quota that contributes to a balance, and so affect the entire subscriber balance.

Note Take care about which you delete with the red circle/white dash. If you delete the Balance item on the screen, all of the quotas within it are deleted as well.

Click the red circle/white dash associated with a quota type, for example Quota1, to delete a single quota type within a balance type.

Check the History of Balances

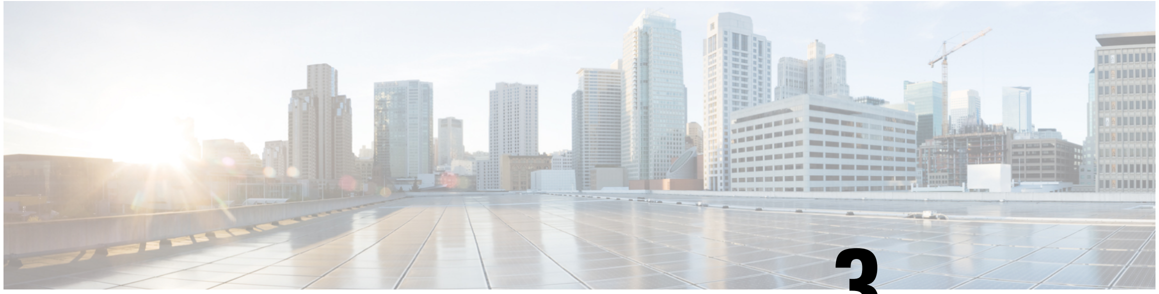
On the Balance screen, you can review the credit transactions against a quota type, but not the debit history.

Step 1 Click the history link associated with the quota.

The History screen shows you the Start and Expiration dates, original amount, transacted amount and any reserved quota.

Step 2 Click on a column heading to sort that column.

Step 3 Click on the down arrow in a column to change the sort or add or remove columns from the display.



CHAPTER 3

Session Tracing

- Session Tracing, on page 25
- View a Subscriber Session, on page 25
- Find Network Sessions, on page 26

Session Tracing

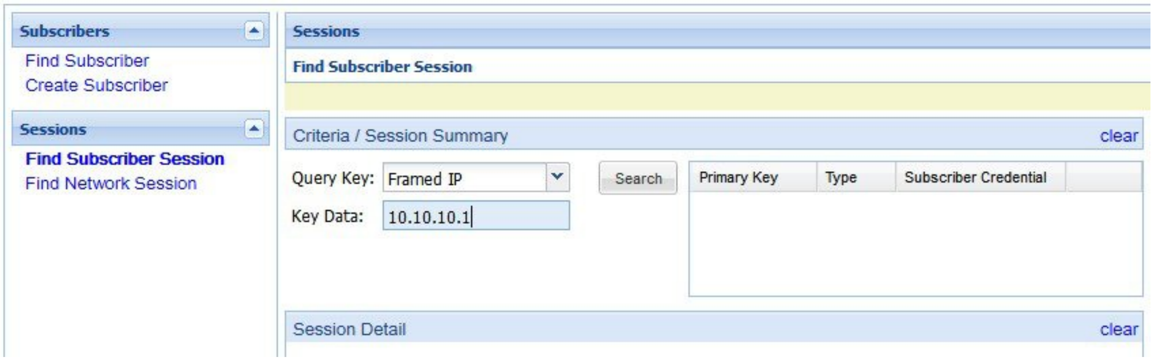
You can check the sessions a subscriber has up in two ways:

- Find a subscriber session, see Viewing a Subscriber Session
- Find a network session then look for subscribers Finding Network Sessions

View a Subscriber Session

This procedure looks at available sessions and lets you find sessions for the subscriber you specify. Contrast this to finding a subscriber and then checking their sessions as described at Sessions Screen.

Step 1 Click the **Subscribers tab** > **Sessions node** > **Find Subscriber Session**.



Subscribers
Find Subscriber
Create Subscriber
Sessions
Find Subscriber Session
Find Network Session
Sessions
Find Subscriber Session
Criteria / Session Summary
clear
Search
Primary Key
Type
Subscriber Credential
Session Detail
clear

Query Key: Framed IP

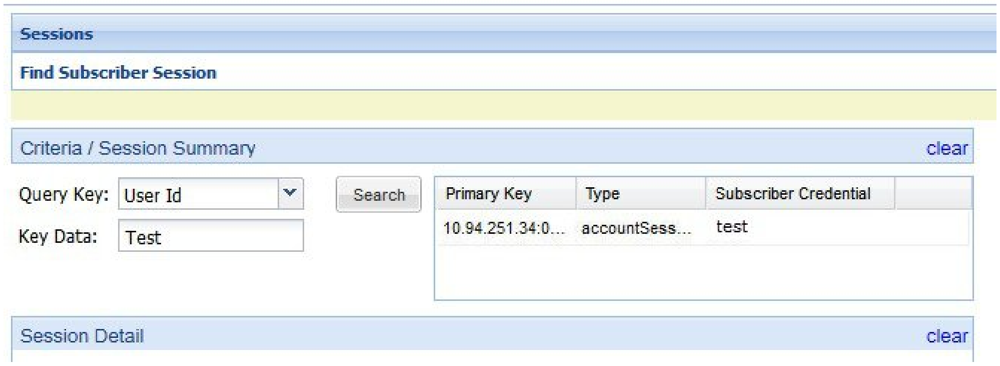
Key Data: 10.10.10.1

Step 2 Click the **Query Key** drop-down list. The following subscriber search options is displayed:

1. User Id

2. Framed IP
3. IMSI
4. MSISDN
5. Framed IPv6 Prefix

Step 3 In **Key Data**, enter a valid information based on the **Query Key** selected in the drop down list.



Query Key: User Id
Key Data: Test

Primary Key	Type	Subscriber Credential
10.94.251.34:0...	accountSess...	test

Step 4 Click **Search** to display the general information about the found session on the right.

Step 5 In the list to the right, hover over a session and double click, or click the open link to display the details about the session.

Find Network Sessions

Use the Find Network Session link to look at selected session running on the network.

Step 1 Click **Subscribers tab** > **Sessions node** > **Find Network Session item in the menu tree**.

Step 2 Fill in the Find Network Session screen.

Field	Description
Query Key	The type of data on the session you want to search for, either framed IP or User ID.
Key Data	The value of the query key, for example, part of a framed IP address.
Query Device	The type of device you want to query. Currently, only ISG is supported.
Results Area	List of all the matches for your query key and key data.

CHAPTER 4

Custom Reference Data Tables

- Custom Reference Data Tables Overview, on page 27
- Concepts for Custom Reference Data Tables, on page 28
- Steps and Procedures, on page 28
- Policy Builder: Constructing Custom Reference Data Tables, on page 28
- Control Center: Populating a Custom Reference Data Table, on page 32
- Typical Tasks for Everyday, on page 39

Custom Reference Data Tables Overview

In Cisco Policy Suite, reference data is considered information that is needed to operate the policy engine, but not used for evaluating policies. For example, under the Reference Data tab in Policy Builder, are the forms used to define systems, clusters, and instances, and to set times and dates used for tariff switching. The policy engine needs to refer to these data only to process policies correctly, but they do not define the policy itself.

Custom reference data is considered reference data that is specific to a service provider, perhaps the names and characteristics of their networks or cell sites.

Such custom reference data is stored in the data structure of a table, with the columns and field attributes defined by the service provider for their specific use. The Policy Builder interface does not provide screens for such customized information because it would be so limiting.

Rather, in Cisco Policy Suite, custom reference data tables provide a way for service providers to create their own data tables and to populate them.

The resulting custom reference data tables can then be used within Policy Builder as criteria to use when escalating policy decisions.

Two interfaces are used to construct and populate custom reference data tables:

- Policy Builder 8.0.0 or greater

  Data table structures are managed in Policy Builder.

- Control Center 3.6 or greater, either the full admin or read only privileges

  Data table content is managed in Control Center.

The information in custom reference data tables handles special considerations such as these:

- Specialty area codes.
- A list of device parameters.
- Location data mapping, to map network sites and cell sites into the subscriber's home network, roaming network, or preferred roaming network.
- IMEI data tagging for smart phone, Apple, or Android device, and then use of that in policies.

Custom reference data tables allow the service provider to create their own data structures and populate them with your own proprietary data.

The data in the tables is then used during policy evaluation.

You can construct your reference data tables yourself, or Cisco may build them for you after installation. If you need any help with custom reference data tables, call your Cisco technical representative.

Concepts for Custom Reference Data Tables

- The Policy Builder interface creates and edits the custom reference data table structure, defines its columns, and defines the data type, ranges and size of the fields.
- Control Center reflects the custom reference data tables constructed in Policy Builder.
- You provide data content to the custom reference data tables in Control Center.
- Spreadsheets can be imported into a custom reference data table structure. Log in to the Control Center interface to do so.
- A key icon is displayed before the column name of the selected CRD tables. This provides the following information:
    - Indicates whether the column in the selected CRD table is a key column or non-key column.
    - Indicates the type of Runtime Binding and its value in a tooltip when you hover over it.

When constructing the custom reference data table in the Policy Builder, look at the spreadsheet you want to import later and use the same column names, data types and other attributes.

Steps and Procedures

- Use Custom Reference Table with Policy Builder.

  These steps need only be completed once and may already be completed.
- Use Custom Reference Table with Control Center.

  These steps need to be completed for every custom reference data table you want to create or edit.

Policy Builder: Constructing Custom Reference Data Tables

There are two tasks needed to create custom reference data tables:

- Setting Up the System Plug-in Configuration
- Creating or Editing a Custom Reference Data Table

Set Up the System Plug-in Configuration

You only have to do this one time for each system, cluster, or instance. Then you can create as many tables as needed. The steps below configure an example system.

Before you begin

Before you can create a custom reference data table, configure your system to use the Custom Reference Data Table plug-in configuration.

Step 1 Log in to Policy Builder and click **Reference Data tab** > **Systems node** > **the system of your choice** > **Plugin Configurations**.

Step 2 Click **Custom Reference Data Configuration** in the main pane.

The tree on the left is populated with the configuration.

Step 3 Fill in the Custom Reference Data Configuration screen that appears.

Field	**Description**
Primary Database IP	This is the IP of the sessionMgr database.
Secondary Database IP	Optional, this field is the IP address of a secondary, backup, or failover sessionMgr database.
Port	This is the port number of the sessionMgr. It should be the same for both the primary and secondary databases.

Step 4 Go on to create data table structures as described at Create or Edit a Custom Reference Data Table, on page 29.

Create or Edit a Custom Reference Data Table

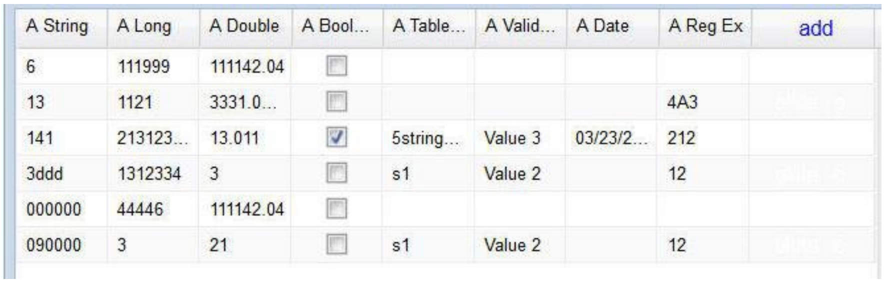
Before you begin

Before you begin, be sure that you have configured the plug-in as described in Setting Up the System Plug-in Configuration. Click **Reference Data** > **Systems** > **Plugin Configuration** and make sure you see the Custom Reference Data Config in the tree.

Step 1 In Policy Builder, click **Reference Data** > **Custom Reference Data Tables node**.

Step 2 To create a new data table, click **Summary** > **Custom Reference Data Tables link** in the main pane.

Step 3 To edit a table, click a table name in the tree.



A String	A Long	A Double	A Bool...	A Table...	A Valid...	A Date	A Reg Ex	add
6	111999	111142.04	☐					
13	1121	3331.0...	☐				4A3	
141	213123...	13.011	☑	5string...	Value 3	03/23/2...	212	
3ddd	1312334	3	☐	s1	Value 2		12	
000000	44446	111142.04	☐					
090000	3	21	☐	s1	Value 2		12	

Note Simply editing the name of a table results in a loss of the table. If you want to change a table name, make a copy first, and then change the name of the copy. No data is in the newly copied table but you have the new name.

Step 4 Fill in the Data Table screen that appears.

Step 5 The example shows the columns defined for a table called Countries.

Field	Description
Name	Here, Name is the internal name for the column. Best practice is to name the column so that it is recognizable as a key.
Display Name	This is the table name as you want it to display in Control Center.
Type	This is the data type of the column, that is: • Date, month day and year • Date and time. A valid date is from 1900 to 2099. • Decimal, for decimal or currency • Number, or integer • Text • True / False as Boolean
Key	If checked, it specifies that each row in the table must be unique. If unchecked, when entering data in Control Center the admin receives an error message. Note that several columns can contribute to the whole key. Best practice is to name the column so that it is recognizable as a key.
Is Required	If checked, this box forces the Control Center admin to enter some value when populating data in the table.
Columns Area	You must change the first row to enable fields in the rest of the screen.

Step 6 Click on a row in the Columns definition table at the top, and access the fields on the bottom, working your way through all of the column names listed.

In the example, at the top, the row selected is the column called Continent, a key and required data. In the Valid Values area, only the names of continents in the list is permitted as valid entries. In the example, some continent names have been omitted.

On the right side of the screen, these fields are available.

Field	Description
Regular Expression	Define a regular expression to define a specific data format. For example, if you define a regular expression here, you ensure that a phone number is entered in a phone number format, or a date is entered as a date format.
Regular Expression Description	This is the description of what you are trying to achieve above. In Control Center, this appears as user help or as a tip to help those administrators enter data in the correct format.
None	Select this radio button if you do not have any need for Binding to CPS.
Bind to Subscriber AVP Code	Control Center and Cisco Policy Server may correlate on the basis of AVP codes. If so, specify these codes here.
Bind to Session/Policy State Field	Bind fields are the specific points of intersection to the policy engine, and are optional. Control Center may not have any specific or defined 'hooks' into the Cisco Policy Server. Click the Select button to display a list of objects that can be used to relate Control Center with Cisco Policy Server at specific data points.
Bind to a result column from another table	Optional. This field lets you specify a column in this table or any other table in the tree and lets that table furnish the data for the current table. This practice helps maintain consistency across tables. This example selects the table named test_table, column aString, to use the value in that table's column and row to use as a result in the current table.
Bind to Diameter request AVP code	This field lets you enter a specific AVP to bind to. Doing so improves processing times.

Delete Reference Data Tables

Contact your Cisco technical representative for these delete tasks:

- Delete a custom reference data table
- Delete columns in a table
- To change the name of a table without using the copy link

Changing a table name has the same result as creating a new table. The first named table does not appear to the admin in Control Center. The New table name has no data in it. this is because Policy Builder does not write to the database and change the table name.

Last Tasks

Now populate or edit the contents of these table columns. provide them with rows and rows of data.

See Control Center: Populating a Custom Reference Data Table, on page 32.

Control Center: Populating a Custom Reference Data Table

The custom reference data table structures are created and edited in the Policy Builder interface. See Policy Builder: Constructing Custom Reference Data Tables, on page 28 for those procedures.

Import Data from a Spreadsheet

If you have a spreadsheet that already has data rows, you can import the spreadsheet into a custom reference data tables. Of course, the data table itself must be created in Policy Builder. However, importing the data occurs in Control Center.

Note When the tables are created in Policy Builder, have your spreadsheet open to make sure you match the data type, for example string, date, or number.

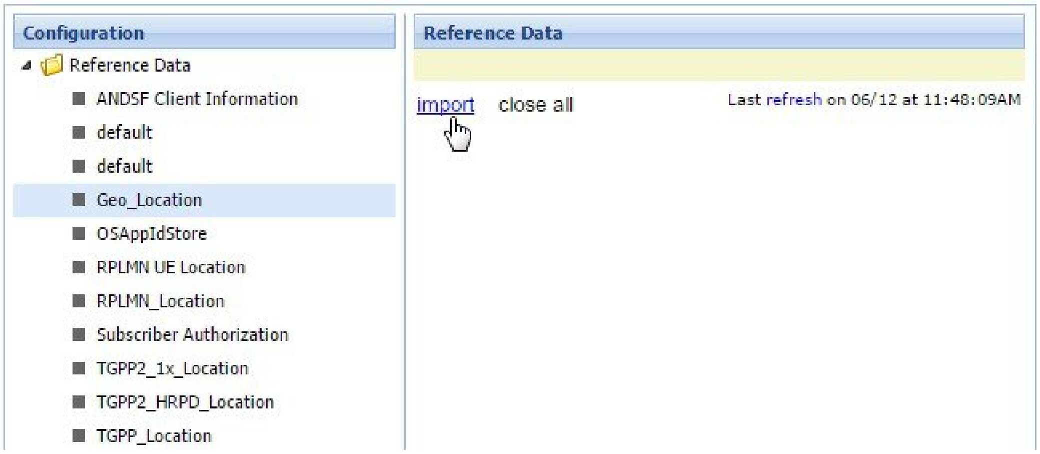
Step 1 Log in to Control Center.

Step 2 **Configuration tab** > **Reference Data folder** > **table list**.

Step 3 Select the table that receives data from the spreadsheet.

Step 4 Click the **import** link.

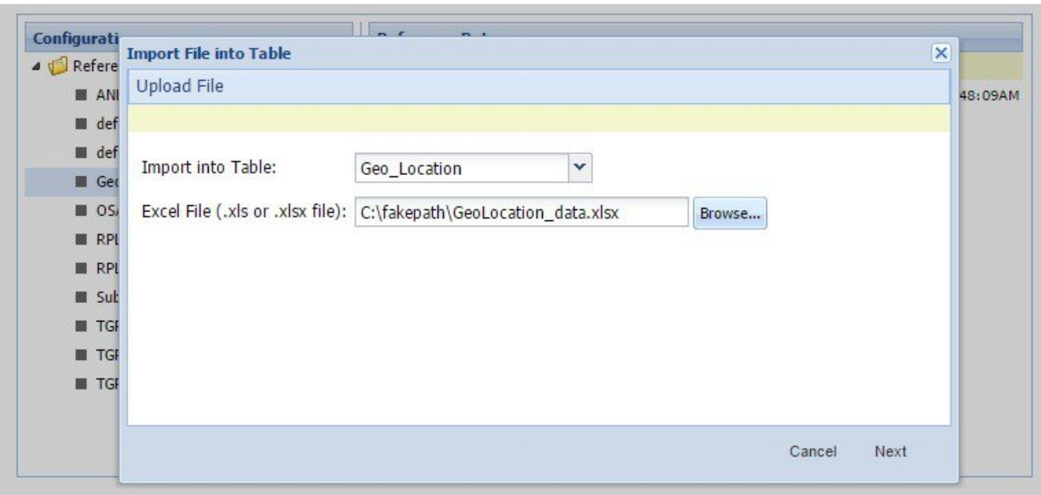
Figure 1: Import Data


Configuration
Reference Data
ANDSF Client Information
default
default
Geo_Location
OSAppIdStore
RPLMN UE Location
RPLMN_Location
Subscriber Authorization
TGPP2_1x_Location
TGPP2_HRPD_Location
TGPP_Location
Reference Data
import
close all
Last refresh on 06/12 at 11:48:09AM

Note The CRD tables whose Svn Crd Data flag is disabled do not get listed in the dropdown as import of Svn CRD table data is not supported.

Step 5 The table you selected under the Reference Data tree appears in the Import into Table field. You do not have to type it in. Make sure this is the table that is to receive data from the spreadsheet.

Step 6 Either name or browse for the .xls or .xlsx file you want to import, the one that populates the table.


Import File into Table
Upload File
Browse...
Cancel
Next

Import into Table: Geo_Location

Excel File (.xls or .xlsx file): C:\fakepath\GeoLocation_data.xlsx

Step 7 Click the Next button in the lower corner.

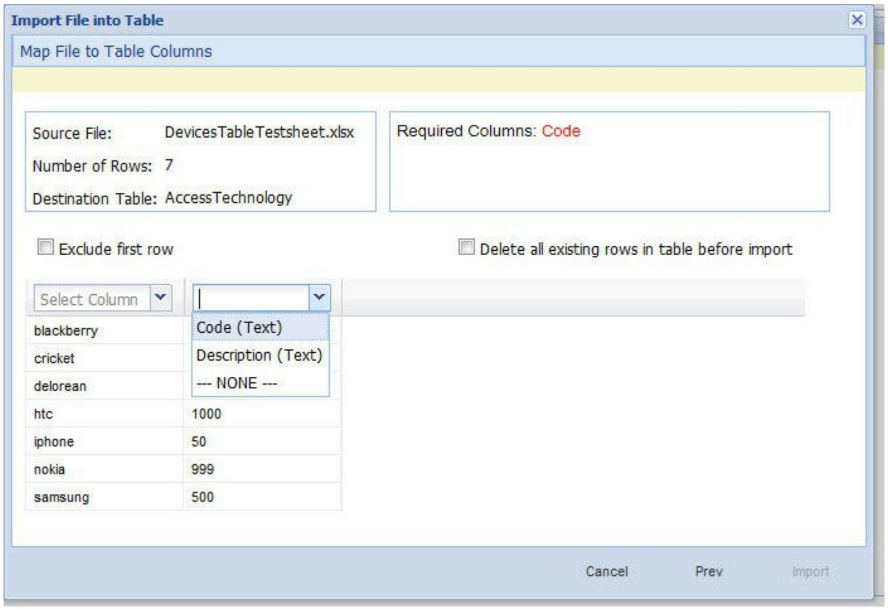
The Map file to Table Columns screen lets you select the columns in the spreadsheet that you want to use in the Access Technology table.

Step 8 Check Exclude first row if your .xls spreadsheet has headers.

Step 9 Check Delete all rows if you want to completely empty the Access Technology table and bring in all new rows.

Step 10 In the Select Column drop-down lists, specify what column of the Access Technology table you want to place your spreadsheet columns in.

Note The Select Column list shows the column names in Access Technology table as they were created in Policy Builder. This drop-down list does not show the column names in your spreadsheet.


Import File into Table
Map File to Table Columns
Code (Text)
Description (Text)
--- NONE ---
Cancel
Prev
Import

Source File: DevicesTableTestsheet.xlsx
Number of Rows: 7
Destination Table: AccessTechnology

Required Columns: Code

☐ Exclude first row
☐ Delete all existing rows in table before import

Select Column	
blackberry	
cricket	
delorean	
htc	1000
iphone	50
nokia	999
samsung	500

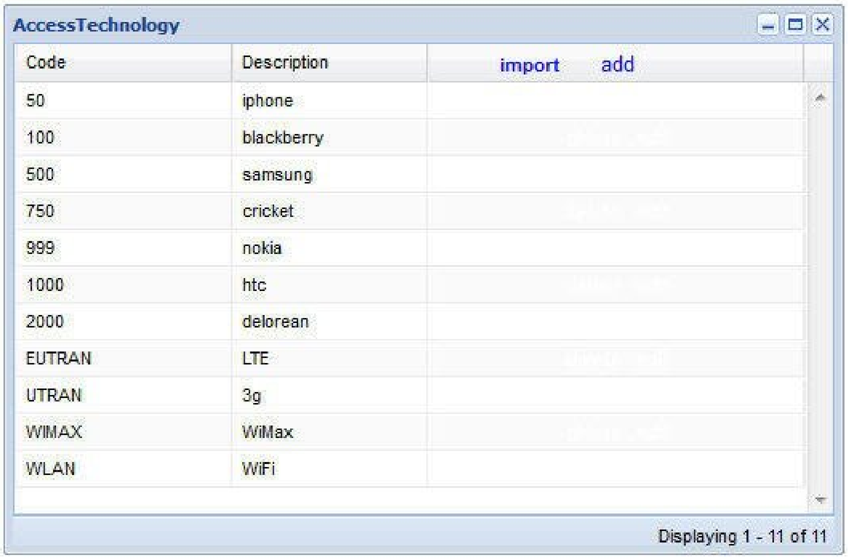
In our example, we want to place the device names in the Code column and the numeric values in the Description column.

Step 11 In the lower right, click the Import link to proceed, or the Prev link to go back.

Step 12 Notice the Import Successful screen.

Step 13 Select Open AccessTechnology in the lower left to check your import, then click Done.

The newly populated table appears for you to check.


AccessTechnology
import
add
Displaying 1 - 11 of 11

Code	Description
50	iphone
100	blackberry
500	samsung
750	cricket
999	nokia
1000	htc
2000	delorean
EUTRAN	LTE
UTRAN	3g
WIMAX	WiMax
WLAN	WiFi

The AccessTechnology table has the new rows added, in the proper columns.

Enter Data Manually

For data tables that are small, or are not derived from a spreadsheet, use the Control Center interface to enter data manually into the rows of custom reference data tables.

Step 1 Log in to Control Center.

Step 2 Click **Configuration tab** > **Configuration node** and open the Reference Data folder.

The items under the Reference Data folder are the table names created in Policy Builder.

Note If you do not see the table name that you want, go to the Policy Builder and create it.

Step 3 In the tree, click a table name to open it.

The table window shows the table structures and columns.

Our example uses AccessTechnology, which has several rows of data already in it.

Note Add to and edit rows in a table with these tips:

- Click on a row and it becomes editable.
- You can enter content in fields, select check boxes, use the drop downs.
- You can build a table of values to use in another table.
- Date fields use the calender widget.
- Save or cancel the row. Save persists the rows to the database.
- Cancel lets the table data revert with no change.
- Carefully delete a row, there is no confirmation.
- Click the add link to add new blank rows.

If the **Svn Crd Data** option is enabled in Policy Builder, Control Center hides all the DML links (delete, insert, edit) of the rows and disables editing option at row level.

Add a Row

Step 1 Open a table.

Step 2 Click the add link in the upper right corner.

Step 3 Note that the new rows is added to the bottom of the table for you to fill in. You cannot insert a row at a specific place.

Step 4 Notice row count in lower right corner.

Note In this interface, the columns do not indicate which are Key columns or Key fields. Best practice is to name the columns with this attribute when creating them in Policy Builder.

Note Any required fields display with red margins to let you know that you must enter data.

Step 5 Use any of the save methods mentioned above to save the row. However, you cannot save a row that has errors.

Edit a Row

There are several ways to save row data and so prevent data loss.

- Click the save link in the column on the far right.
- Press Enter after you have finished in a field.
- Tab over from one field to another until the row is saved.
- Finish in your field and click on another row.

Note There is no way to promote or demote rows.

- There is no way to sort on columns.
- There is no filter or search feature at this time.

Fix Errors in a Row

Errors are denoted as the field margined in red. Help text displays to the far left or far right. Only the cancel link is available until you make a correction.

Delete a Single Row

Step 1 Hover over the row you want to delete.

Step 2 Click the delete link to the right.

The data row is deleted immediately. No refresh needs to occur.

Create a Snapshot

You can create a snapshot of CRD tables on the system. The created snapshot will contain CRD table data, policy configuration and checksum information for all CRD tables.

Perform the following steps to create a snapshot

Step 1 Log in to Control Center.

Step 2 Navigate to **Configuration** tab.

Step 3 Click **Reference Data**.

Step 4 Click **create snapshot**.

A **Create a Snapshot** dialog box is displayed.

Step 5 Enter snapshot details.

Step 6 Click **Create**.

The snapshot is created displaying the following details:

- Snapshot Name
- Policy version
- Creation Date and time
- User Comments
- Snapshot Path
- Checksum Details

To view the checksum information, click **Checksum Details**.

If the snapshot creation fails an error message is displayed.

If there are Svn CRD tables in the database while creating a snapshot, they are skipped and the following warning message is displayed:

Datasource for tables [svnTable-1 is subversion]. Skipping these tables to be a part of created snapshot as create snapshot is not allowed for subversion tables.

Revert a Snapshot

You can revert the CRD data to a specific snapshot.

Preform the following steps to revert a snapshot:

Step 1 Log in to Control Center.

Step 2 Navigate to **Configuration** tab.

Step 3 Click **Reference Data**.

Step 4 Click **revert snapshot**.

A **Revert a Snapshot** dialog box is displayed.

Step 5 Select a specific snapshot from the **Snapshot Name** drop down list.

Note If a specific snapshot name is not selected, the latest snapshot will be populated.

If the snapshot directory is empty, **No snapshot found in the system** message will be displayed.

Step 6 Click **Revert**.

A **Confirmation Required** dialog box is displayed.

Step 7 Click **Yes**.

The specific snapshot is reverted displaying the following details:

- Snapshot Name
- Policy version
- Creation Date and time
- User Comments
- Snapshot Path
- Checksum Details

If the snapshot revert fails an error message is displayed.

If there are SVN CRD tables in the database while reverting a snapshot, they are skipped and the following warning message is displayed:

Datasource for tables [table_with_date_time] is subversion. Data for these tables will be reverted using svn datasource not from datasource (mongodb)

Export All

You can export contents of all CRD tables to Microsoft Excel. The data is exported in CSV format in a zip file.

Perform the following steps to export CRD table data:

Step 1 Log in to Control Center.

Step 2 Navigate to the **Configuration** tab.

Step 3 Click **Reference Data**.

Step 4 Click **Export All**.

The contents of the CRD table is generated in a csv format in a zip file.

Step 5 Click **Save File**.

Step 6 Click **OK**.

The zip file contains multiple CSV file containing CRD table schema and content corresponding to every CRD table and an '.exportCrdInfo' metadata file containing the following data:

- exportDate - Date of the CRD Data when it is exported.
- exportDateMillis - Time in milli seconds when the CRD Data is exported.

- exportVersion - Exported verison of the CRD Data whose value is 1 currently.

Import All

You can import contents of all CRD tables in bulk from Control Center. The data is imported in CSV format in a zip file.

When Import All operation is performed the tables whose CSV files are present in the archive zip file will be updated with the corresponding content without affecting other CRD tables existing in Control Center.

Perform the following steps to import CRD tables data in bulk:

Step 1 Log in to Control Center.

Step 2 Navigate to **Configuration** tab.

Step 3 Click **Reference Data**.

Step 4 Click **Import All**.

An **Import All Tables** dialog box is displayed.

Step 5 Click **Browse** and select the file to be imported.

Step 6 Click **Import**.

The following warning message is displayed for Svn Crd tables which are skipped under the Import All option:

Datasource for tables [table_1, table_2, ...] is subversion. Skipping these tables to be a part of import operation. Import operation is not allowed for subversion tables.

Typical Tasks for Everyday

These navigation tasks and activities are specific to the custom reference data tables in Control Center.

Refresh the Screen

- The refresh link in the upper right corner.
- Click the refresh link to force a refresh.
- A successful refresh message appears on the right.
- The usual refresh time is every 5 minutes, and is refreshed from the server.
- In the middle of updating, refresh is deferred.
- Upon close and reopen a table, the refreshed table is displayed.
- The refresh interval for these tables cannot be changed.

Navigate the Table Screens

- Multiple tables can be open at one time.
- Icons in the tree to show the open and active focus.
  - Circle with hyphen—open table
  - Circle with arrows—active table focus
  - Square—table not open
  - Blue square—table open and in the tray at bottom
- Icons in the upper right corner of a table minimize, maximize, or close the table. When minimized, the table heading displays at the bottom of the screen in the tray.
- To restore a table to view,
  - Click the restore button of the table in the tray,
  - Or
  - Double click the table tab in the tray.
- Resize a table for viewing by dragging the edges.
- Narrow or widen a column by dragging the margin of the column head.

Navigate in a Row

- If you have many columns, they cannot all display in the browser. You must scroll to the far right to get to the delete, edit, save, cancel links.
- Notice that in the bottom right corner, there is a indicator of how may rows you are viewing at the moment, and how many rows there are total in the table.