Cisco Policy Suite Control Center 3.4 Interface Guide for Full Privilege Administrators

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Preface


This document describes the functions and uses of the Cisco Control Center 3.4 for those administrators who log in with full read and write privileges.

Read about these topics in the following sections:

- Audience
- Additional Support
- About Cisco Control Center
- What’s New
- Roles
- Finding the Version Number
- Cisco Control Center and Other CPS Interfaces

Audience

This guide is for employees of Cisco Systems, Inc. only, and their partners and trained customers. This document is not subscriber-facing. For example, the reader of this document might be:

- Customer service representatives (Cisco TAC)
- Deployment engineers (Cisco AS)
- System administrators and engineers, both full privilege and view only administrators (trained customers)

This document assumes an intermediate level of understanding of network architecture, configuration, and operations. This document is most helpful if readers have completed Cisco training classes and have a firm introduction to the concepts and behavior of Cisco Control Center.
Additional Support

For further documentation and support:

- Click the help button on your interface. This PDF document is available as help. You can see the build number and issue date, useful to report when troubleshooting.
- 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 your other documents.

About Cisco Control Center

Note

Cisco Control Center 3.4 requires Cisco Policy Builder release 6.0.

The Cisco Cisco Control Center is one of several interfaces to Cisco Policy Suite. Specifically, the Cisco Control Center lets you do these tasks:

- Manage subscriber data, that is, find or create and edit information about your subscribers.
- Stop or check subscriber sessions.
- Review and manage system sessions.
- Monitor the various CPS virtual machines from this interface.
- Populate customer reference data tables.
- Monitoring dashboards, real-time and historical data.

What’s New

Cisco Control Center 3.4 has these new features:

- Version number displays under the help link
- Operational Monitoring tab, custom dashboards, and charts for real-time data

Roles

There are two levels of administrative roles supported by Cisco Control Center, full privilege and view only. This guide is for full privilege users.

- **Full privilege admin users**—Full privilege administrators can view, edit, and delete information in the interface. Full privilege administrators have full access and can perform all tasks. Admin users have access to all screens in the interface.
- **View only admin users**—This level of administrator has view capabilities, but can not edit or change information. View only administrators have access to a subset of the screens in the interface.
The logins and passwords for these two administrative roles are configurable in LDAP or in etc/broadhop/authentication-password.xml.

### Installation and Logins

The Cisco Control Center software is installed when you install the Cisco Policy Suite. There is no separate installation process. The Cisco Control Center software runs on qns01 and qns02 on the Cisco Policy Suite Control Center.

To log in, you need to have the URL, a username, and a password.

The URL for your site is similar to this one:

http://<xxx:8090>

where `xxx:8090` is the IP address of Cisco Control Center specific to your network.

When you log in successfully, you’ll see the default Cisco Control Center screen, that is, the Subscribers tab > Find Subscriber page.

### Finding the Version Number

Click the help link on the top right.
Click About in the list.

Requirements

To use the Cisco Control Center interface, your system must meet these requirements:

- CPS 6.1 or higher
- Cisco Subscriber Manager 2.0 or higher
- Cisco Unified MsBM 2.0

Cisco Control Center and Other CPS Interfaces

Cisco Control Center is part of a set of other CPS interfaces that you may have separate access to.

- Subscriber Portal
- Cisco Policy Builder interface
- CPS Command Line Interface
- Deployment Management Console
- APIs
- TUI

Other Documents

Please find the entire document set for this software release at:


Find glossary of terms is available at:

- [http://tools.cisco.com](http://tools.cisco.com)

Site Map

Subscribers tab

- Subscribers node
  - Find Subscriber item
  - Create Subscriber item

Sessions node

- Find Subscriber Session item
- Find Network Session item

Monitoring tab

- Monitoring node
- List of dashboards
- Health node
  - System Health item
- Configuration tab
- Configuration node
  - Reference Data folder
    - list of reference tables
Subscriber Screens

Revised: September 26, 2014,
This section 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.

This chapter covers these topics:

- Finding, creating, and deleting a subscriber
  - Finding a Subscriber
  - Creating a Subscriber
  - Editing a Subscriber
  - Deactivating or Activating a Subscriber
  - Deleting a Subscriber
- Changing a subscriber’s log in credential
  - Changing the Credential ID of a Subscriber
- Adding and removing services for a subscriber
  - Overview Screen
- Viewing a subscriber’s session
  - Sessions Screen
- Stopping sessions
  - Sessions Screen
- Managing and changing balances and quotas for the subscriber
  - Balance Screen

After you log in, the default page of the Cisco 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.

![Image of Subscribers tab interface]

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.

**Finding 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.

**Step 3** Matches to your search criteria appear in the Results table.
When you hover your mouse over an item in the list, use the open link on the right to display more information about the subscriber, or delete the subscriber with the delete link.

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.

**Subscriber Screens Definitions**

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

- **Overview Screen**
- **Details Screens**
  - General Screen
  - Credentials Screen
  - Services Screen
  - Notifications Screen
Overview Screen

When you find a subscriber and open their record, the Overview screen appears. The menu tree on the left displays the subscriber name and four submenus. The Overview screen, with its six sub-areas, appears on the right.

- If you click the edit link at the right of the area labeled General, you can edit the fields displayed there. That is, the subscriber’s Name, the assigned domain, their status, and start and end dates of service.
If you click any of the edit links in the sub areas, for example Credentials or Notifications, you can add, edit, or remove information for that specific aspect of the subscriber.

**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 — See General Screen
- Credentials or passwords — See Credentials Screen
- Services the subscriber pays for — See Services Screen
• Notification preferences — See Notifications Screen
• Subaccount users under the subscriber — See Subaccount Screen.

General Screen

**Step 1**  Click Subscribers tab > Subscribers node > Find Subscriber item in the menu tree.
Find the subscriber as described in Finding a Subscriber.

**Step 2**  Click Details > General.

| Name | This single field is for both the first and last name of the subscriber. |
| Domain | This drop-down list lets you assign the subscriber a domain. Domains themselves are created in the Cisco Policy Builder interface. |
Chapter 1  Subscriber Screens

Details Screens

<table>
<thead>
<tr>
<th>Status</th>
<th>The Status field shows these three states for a subscriber:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Active and able to use services</td>
</tr>
<tr>
<td></td>
<td>• Deleted and no longer part of your system</td>
</tr>
<tr>
<td></td>
<td>• Suspended and in the system, but not able to use services</td>
</tr>
</tbody>
</table>

By default, status for a new subscriber is always ACTIVE, but you can change this.

<table>
<thead>
<tr>
<th>Start Date</th>
<th>Use the calendar widget to specify the start and stop date and time of service to the subscriber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Date</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Role</th>
<th>When the subscriber logs in to your subscriber portal, this field determines how much read-write privilege is granted to them.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>For example, the primary subscriber might be a team leader responsible for team member accounts</td>
</tr>
<tr>
<td></td>
<td>See Subaccount Screen.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>External ID</th>
<th>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.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Rate Plan</th>
<th>Enter predefined rate plan codes, such as prepaid or postpaid. Rate plans are created in Cisco Policy Builder and are obtained from that administrator.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Charging ID</th>
<th>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'.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Custom Data Area</th>
<th>This area lets you use a look up list, or key-value pairs to keep track of other variables that concern your subscriber.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>This is the key portion of a key-value pair.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>This is the definition or value of the key-value pair.</td>
</tr>
</tbody>
</table>
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.

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

**Step 3** Click the add or edit link to display the Credential Detail screen.

<table>
<thead>
<tr>
<th>Credential ID</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>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.</td>
</tr>
<tr>
<td>Description</td>
<td>This field lets you provide more information about this particular credential.</td>
</tr>
<tr>
<td>----------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Expiration Date</td>
<td>Uses the calendar widget to set an end date to the credential and so restrict logins.</td>
</tr>
<tr>
<td>Password</td>
<td>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.</td>
</tr>
<tr>
<td>New Password</td>
<td>Change the password already defined.</td>
</tr>
<tr>
<td>Confirm Password</td>
<td>This entry must match the new password.</td>
</tr>
</tbody>
</table>
Services Screen

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

**Step 1**
Click Subscribers tab > find a subscriber > Details in the menu tree.

**Step 2**
Then click Services to the left.

Services and service plans are developed in Cisco Policy Builder and are reflected here for you to choose from. Services are a point of intersection between Cisco Control Center and Cisco Policy Builder.

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

<table>
<thead>
<tr>
<th>Service Name</th>
<th>Enter the name or code of the service.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enabled</td>
<td>If checked, this box allows the subscriber to use the service. Unchecked, the subscriber cannot access the service.</td>
</tr>
<tr>
<td>Custom Data</td>
<td>This area lets you use a look up list, or key-value pairs to keep track of other variables that concern your service.</td>
</tr>
<tr>
<td>Code</td>
<td>This is the key portion of a key-value pair.</td>
</tr>
<tr>
<td>Value</td>
<td>This is the definition or value of the key.</td>
</tr>
<tr>
<td>Schedule</td>
<td>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.</td>
</tr>
<tr>
<td>Details Screens</td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
</tr>
<tr>
<td><strong>Start Time</strong></td>
<td>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 <strong>Turn off service during these times</strong> check box, you prevent access during the times specified here.</td>
</tr>
<tr>
<td><strong>End Time</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dates</strong></td>
<td>Set dates to limit subscriber access on a wider basis.</td>
</tr>
<tr>
<td><strong>Start Date</strong></td>
<td>Use the calendar widget to set a specific start and end date to service. Conversely, check the <strong>Turn off service during these times</strong> check box and prevent access during the dates specified here.</td>
</tr>
<tr>
<td><strong>End Date</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Day of Month</strong></td>
<td>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 <strong>Turn off service during these times</strong> check box to deny access to a service on a particular day of the month.</td>
</tr>
<tr>
<td><strong>Day of Week</strong></td>
<td>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 <strong>Turn off service during these times</strong> check box for both schedules, you prevent access on weekends specifically.</td>
</tr>
<tr>
<td><strong>Month</strong></td>
<td>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 <strong>Turn off service during these times</strong> check box to deny access to a service for a particular month, perhaps during vacation period.</td>
</tr>
<tr>
<td><strong>Year</strong></td>
<td>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 <strong>Turn off service during these times</strong> check box to deny access to a service for a particular year.</td>
</tr>
<tr>
<td><strong>Repeat</strong></td>
<td>This field interprets the Schedule detail, showing if the schedule has a recurring aspect.</td>
</tr>
</tbody>
</table>
Adding a Service to a Subscriber

Step 1  
To add a service to a subscriber, click Subscriber tab > find a 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.

Step 3  
Click the Select button.

Note  
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.
Removing 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.

---

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 Cisco Policy Builder prior to using this screen.

---

**Step 1**  Click Subscriber tab > Subscribers tree > find a subscriber > Details > Notifications.
Step 2  Click the add link at the top.

Step 3  Fill in the Notification Detail screen.

<table>
<thead>
<tr>
<th>Type</th>
<th>Contact your subscriber with one of these methods in the drop-down menu:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real time / XML</td>
<td></td>
</tr>
<tr>
<td>SMS</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
</tr>
<tr>
<td>Apple iPhone push</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Destination</th>
<th>Specify the address for the notification.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>For an XML message, provide URLs.</td>
</tr>
<tr>
<td></td>
<td>For an SMS message, provide the destination number, perhaps 555544444.</td>
</tr>
<tr>
<td></td>
<td>For an email notification, provide an email address.</td>
</tr>
<tr>
<td></td>
<td>For an Apple iPhone push, provide the server gateway, server port, and</td>
</tr>
<tr>
<td></td>
<td>certificate and certificate password.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Enabled</th>
<th>Click this check box to allow notifications to go through, or uncheck</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>it if you are still developing the message.</td>
</tr>
</tbody>
</table>
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.

**Details Screens**

<table>
<thead>
<tr>
<th>Custom Data Area</th>
<th>This area lets you use a look up list, or key-value pairs and so keep track of other variables that concern your subscriber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>This is the key portion of a key-value pair.</td>
</tr>
<tr>
<td>Value</td>
<td>This is the definition or value of the key.</td>
</tr>
</tbody>
</table>

**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.

**Step 1**

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

**Step 2**

Find the primary subscriber, the person responsible for the subaccount.

**Step 3**

Click Details > Subaccounts and click the add link in the corner.

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.

Tip

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

Session Details Table

Although there are several ways to find a session, the Session Detail table that appears contains information about the session, including a Remove Session link.

An example of a Session Detail is shown next.

<table>
<thead>
<tr>
<th>Session Tabs</th>
<th>At the top, a tab exists for each session the subscriber has running. The example has one tab, the subscriber has one session up.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query Devices</td>
<td>This check box lets you filter the session information below to one or more devices.</td>
</tr>
<tr>
<td>Network Query</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 and quota codes can be added and deleted separately, but deleting a balance code deletes all the quota codes under it.

Balance codes and quota codes are developed and maintained in the Cisco Policy Builder interface. Cisco 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.
Chapter 1  Subscriber Screens

Balance Screen

- **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 Cisco 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.

![Credit Quota](image)

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.

Adding 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.

![Last Refresh](image)

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

![Add Balance](image)

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 Cisco Policy Builder interface for these drop-down lists.

Note  We should verify the date and time specific functionality by setting the client timezone to server timezone.
Crediting or Debiting 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.

![Balance Screen](image)

**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.

![Credit Quota](image)

![Debit Quota](image)

**Deleting 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.

Deleting 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.

Checking the History of Balances

On the Balance screen, you can review the credit transactions against a quota type, but not the debit history.
Changing the Credential ID of a Subscriber

**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.

Changing 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.

Creating 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 Cisco Policy Builder interface and are displayed here. Domains are a point of intersection between Cisco Control Center and Cisco 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 — General Screen
- Credentials — Credentials Screen
- Services — Services Screen
- Notifications — Notifications Screen
- Subaccounts — Subaccount Screen

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.

**Editing a Subscriber**

**Step 1**  
Find the subscriber as described at Finding a Subscriber.

**Step 2**  
Hover over the name displayed in the Results table and click Open.
The Subscriber Overview screen appears.

<table>
<thead>
<tr>
<th>General</th>
<th>edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: Bilbo Baggins</td>
<td></td>
</tr>
<tr>
<td>Domain: Venue</td>
<td></td>
</tr>
<tr>
<td>Status: ACTIVE</td>
<td></td>
</tr>
<tr>
<td>Start Date:</td>
<td></td>
</tr>
<tr>
<td>End Date:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Credentials</th>
<th>edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credential Id: KR/656</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Services</th>
<th>edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Code</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notifications</th>
<th>edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td></td>
</tr>
<tr>
<td>Destination</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subaccounts</th>
<th>edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Credential Id:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sessions</th>
<th>manage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Key:</td>
<td>Type:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quota</th>
<th>manage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
</tr>
<tr>
<td>Remaining Amount:</td>
<td></td>
</tr>
<tr>
<td>Original Amount:</td>
<td></td>
</tr>
</tbody>
</table>

**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:

- Overview Screen
- Details Screens
  - General Screen
  - Credentials Screen
  - Services Screen
  - Notifications Screen
  - Subaccount Screen
- Sessions Screen
- Balance Screen

**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 Finding 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.
Deleting a Subscriber

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

**Step 1** Click Subscribers tab > Subscribers node > Find Subscriber item in the menu tree.
Find the subscriber as described on Finding 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.

The Results table redisplays your matches, but without the deleted subscriber.
Session Tracing

Revised: September 26, 2014,
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

Viewing 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.

Step 2
For Query Key, select to use either the subscriber’s credential ID or the framed IP address of the session, if you know it.
You must enter the full ID or IP address. Partial information here proves unsuccessful.
Step 3  In Key Data, enter a valid user ID or a valid framed IP that is your target.

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.

![Image of session tracing interface]

**Session Detail Area**

| Query Key | Select this drop-down to search for a session of either a User ID or Framed IP address:  
| --- | ---  
| User ID, that is, the subscriber's credential  
| Framed IP address, that is, the part of the RADIUS access request that tries to map out or hint at the subscriber's IP address.  
| Key Data | This is data you want to match on, that is, a part of a Credential.  
| When a session is found, this table shows information about the session:  
| Primary Key | The sessions that match the criteria set above appear in this table. Select one to see more details about it in the Session Details Area.  
| Type | This is the type of session. In the example above, an accountSessionId is the ID on the ISG.  

---

Cisco Policy Suite Control Center 3.4 Interface Guide for Full Privilege Administrators

2-3
Finding 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.

<table>
<thead>
<tr>
<th>Subscriber Credential</th>
<th>This is the unique ID for the subscriber, their credential that they log in with.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session Detail Area</strong></td>
<td>This area shows complete session information about the session you have highlighted in the Primary Key table.</td>
</tr>
</tbody>
</table>

**Finding Network Sessions**

**Subscriber Credential**

This is the unique ID for the subscriber, their credential that they log in with.

**Session Detail Area**

This area shows complete session information about the session you have highlighted in the Primary Key table.

**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.
Customer Reference Data Tables

Revised: September 26, 2014,

In CPS, 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 Cisco 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.

Customer 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 customer 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 Cisco Policy Builder interface does not provide screens for such customized information because it would be so limiting.

Rather, in CPS, customer reference data tables provide a way for service providers to create their own data tables and to populate them.

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

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

- Cisco Policy Builder 6.0 or greater
  Data table structures are managed in Cisco Policy Builder.
- Cisco Control Center 3.4 or greater, either the full admin or read only privileges
  Data table content is managed in Cisco Control Center.

The information in customer 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.

Customer 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 customer reference data tables, call your Cisco technical representative.
Concepts for Customer Reference Data Tables

- The Cisco Policy Builder interface creates and edits the customer reference data table structure, defines its columns, and defines the data type, ranges and size of the fields.
- Cisco Control Center reflects the customer reference data tables constructed in Cisco Policy Builder.
- You provide data content to the customer reference data tables in Cisco Control Center.
- Spreadsheets can be imported into a customer reference data table structure. Log in to the Cisco Control Center interface to do so.

When constructing the customer reference data table in the Cisco 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 Customer Reference Table with Cisco Policy Builder.

Cisco Policy Builder: Constructing Customer Reference Data Tables

These steps need only be completed once and may already be completed.

- Use Customer Reference Table with Cisco Control Center.

Cisco Control Center: Populating a Customer Reference Data Table

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

Cisco Policy Builder: Constructing Customer Reference Data Tables

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

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

Setting Up the System Plug-in Configuration

Before you can create a customer reference data table, configure your system to use the Customer Reference Data Table 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.

Step 1
Log in to Cisco Policy Builder and click Reference Data tab > Systems node > the system of your choice > Plugin Configurations.
Step 2  Click Customer Reference Data Configuration in the main pane.

The tree on the left is populated with the configuration.
Step 3  Fill in the Customer Reference Data Configuration screen that appears.

<table>
<thead>
<tr>
<th>Primary Database IP</th>
<th>This is the IP of the sessionMgr database.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Database IP</td>
<td>Optional, this field is the IP address of a secondary, backup, or failover sessionMgr database.</td>
</tr>
<tr>
<td>Port</td>
<td>This is the port number of the sessionMgr. It should be the same for both the primary and secondary databases.</td>
</tr>
</tbody>
</table>

Step 4  Go on to create data table structures as described at Creating or Editing a Customer Reference Data Table.

Creating or Editing a Customer Reference Data Table

Note  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 Customer Reference Data Config in the tree.

Step 1  In Cisco Policy Builder, click Reference Data tab > Customer Reference Data Tables node.

Step 2  To create a new data table, click Summary > Customer Reference Data Tables link in the main pane.
Step 3  To edit a table, click a table name in the tree.

<table>
<thead>
<tr>
<th>Name</th>
<th>Display Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries</td>
<td></td>
</tr>
</tbody>
</table>

**Columns**

<table>
<thead>
<tr>
<th>Name</th>
<th>Display Name</th>
<th>Type</th>
<th>Key</th>
<th>Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continent</td>
<td>Continent</td>
<td>Text</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>Population</td>
<td>Number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AverageTemperature</td>
<td>AverageTemperature</td>
<td>Decimal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leader</td>
<td>Leader</td>
<td>Text</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VacationSpot?</td>
<td>Vacation Spot?</td>
<td>True/False</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DateEstablished</td>
<td>Date Established</td>
<td>Date</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 Cisco Control Center.

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 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.

<table>
<thead>
<tr>
<th>Type</th>
<th>This is the data type of the column, that is:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Date, month day and year</td>
</tr>
<tr>
<td></td>
<td>• Date and time. A valid date is from 1900 to 2099.</td>
</tr>
<tr>
<td></td>
<td>• Decimal, for decimal or currency</td>
</tr>
<tr>
<td></td>
<td>• Number, or integer</td>
</tr>
<tr>
<td></td>
<td>• Text</td>
</tr>
<tr>
<td></td>
<td>• True / False as Boolean</td>
</tr>
</tbody>
</table>

| Key                   | If checked, it specifies that each row in the table must be unique.                                            |
|                       | If unchecked, when entering data in Cisco 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 Cisco 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.                                     |
On the right side of the screen, these fields are available.

<table>
<thead>
<tr>
<th>Regular Expression</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Expression Description</td>
<td>This is the description of what you are trying to achieve above. In Cisco Control Center, this appears as user help or as a tip to help those administrators enter data in the correct format.</td>
</tr>
<tr>
<td>None</td>
<td>Select this radio button if you do not have any need for Binding to CPS.</td>
</tr>
<tr>
<td>Bind to Subscriber AVP Code</td>
<td>Cisco Control Center and Cisco Policy Server may correlate on the basis of AVP codes. If so, specify these codes here.</td>
</tr>
<tr>
<td>Bind to Session/Policy State Field</td>
<td>Bind fields are the specific points of intersection to the policy engine, and are optional. Cisco 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 Cisco Control Center with Cisco Policy Server at specific data points.</td>
</tr>
<tr>
<td>Bind to a result column from another table</td>
<td>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.</td>
</tr>
<tr>
<td>Bind to Diameter request AVP code</td>
<td>This field lets you enter a specific AVP to bind to. Doing so improves processing times.</td>
</tr>
</tbody>
</table>
Deleting Reference Data Tables

Contact your Cisco technical representative for these delete tasks:

- Delete a customer 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 Cisco Control Center. The New table name has no data in it; this is because Cisco 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 Cisco Control Center: Populating a Customer Reference Data Table.

Cisco Control Center: Populating a Customer Reference Data Table

The customer reference data table structures are created and edited in the Cisco Policy Builder interface. See Cisco Policy Builder: Constructing Customer Reference Data Tables for those procedures.

Importing Data from a Spreadsheet

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

When the tables are created in Cisco 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 Cisco 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.

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.

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 Cisco Policy Builder. This drop-down list does not show the column names in your spreadsheet.

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.

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

**Entering Data Manually**

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

**Step 1**
Log in to Cisco 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 Cisco Policy Builder.

**Note**
If you do not see the table name that you want, go to the Cisco 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.

<table>
<thead>
<tr>
<th>String</th>
<th>A Long</th>
<th>A Double</th>
<th>A Bool</th>
<th>A Table</th>
<th>A Valid</th>
<th>A Date</th>
<th>A Reg Ex</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>111999</td>
<td>111142.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1121</td>
<td>3331.0...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>213123...</td>
<td>13.011</td>
<td></td>
<td>6string...</td>
<td>Value 3</td>
<td>03/23/2...</td>
<td>212</td>
</tr>
<tr>
<td>3ddd</td>
<td>1312334</td>
<td>3</td>
<td>s1</td>
<td>Value 2</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>000000</td>
<td>44446</td>
<td>111142.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>090000</td>
<td>3</td>
<td>21</td>
<td>s1</td>
<td>Value 2</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tip

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 calendar 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.

Adding a Row

**Step 1**
Open a table.

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

**Step 3**
Note that the new row 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.
Tip
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 Cisco Policy Builder.

Tip
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.

Editing 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.

Fixing 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.

Deleting a Single Row

Step 1
Hover over the row you want to delete.
Typical Tasks for Everyday

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

**Refresh the Screen**

**Navigating the Table Screens**

**Navigating in a Row**

**Refreshing 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.

![Refresh successful message](image)

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.

## Navigating 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

![Table icons](image)

• 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.

Navigating 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 an indicator of how many rows you are viewing at the moment, and how many rows there are total in the table.
System Health Monitoring

Revised: September 26, 2014,

A system health dashboard monitors key performance indicators (KPIs) and the basic functioning of the system and devices. System Health shows the health of the servers and their components.

To display operational monitoring dashboards see Operational Monitoring.

Overview of System Health

Assess overall CPS system functions quickly with the System Health screens.

In the square boxes or cards that represent a system or VMs, red indicates a problem, which you can get details about.

Green means the VM is functioning properly.
Step 1  
Click the Monitoring tab > Health > System Health to display the System Health screen.

Top Screen

The VMs or systems that this screen assesses are:

- PCRFclient 01 and 02
- CPS server 01 02 03 and 04
- Session MGR01 and 02
- Load balancer 01 and 02
- Portal 01 and 02
- Portal Load Balancer 01 and 02
Overview of System Health

Using the System Health Screen

- The red and green boxes on the System Health screen reflect the functioning of the VMs in your CPS application.

In the example above, the three VMs displayed in red are experiencing trouble. They show System Failure at the top of their card. The three functioning systems show System OK.

- This screen refreshes every 30 seconds by default. This can be changed by the following VM parameter:

  -Dcc.monitoring.autorefresh.seconds=30

  The minimum value allowed is 3 seconds and the maximum is 60000 (one hour).

- This auto refresh behavior continues for three days if you do not intervene.

- Open this screen or click refresh to restart the three day interval.

- If you interrupt the three-day auto refresh interval, the three day schedule starts over.

- If you do NOT interrupt the three day auto refresh interval:
  - The screen displays a message to restart the auto refresh manually.
  - The System Health screen remains unchanged and possibly erroneous without some intervention after the three day auto refresh interval.

- If the system problem is catastrophic, auto refresh does not occur.

- Force a refresh manually.
  Click the refresh link at the top right corner.
System Health Details

Click a red or green system icon to see details about that system.

The example above shows the details of both PCRF clients in the CPS application. Note that:

- There are two PCRF clients, PCRF01 and PCRF02.
- PCRFclient01 is OK, three processes are running without a problem. It has green color associated with that line.
- PCRF02 has a problem, indicated by red coloring.
- In fact, no processes are running on PCRFclient02.
The overall health of PCRFclient is down, and shown in red, even though one client is running properly.

### System Refresh

- To find the last system refresh display, click the Monitoring tab > System Health node and look at the date and time in the upper right corner.
- To refresh the display manually, click the refresh link in the same area.
- After doing so, look for the Refresh successful message in the top left corner.
Operational Monitoring

Revised: September 26, 2014,

After your Cisco Policy Suite is installed and ready to take traffic, you can monitor Diameter messages under the Monitoring tab.

The charts you view in the Cisco Control Center interface are configured in Cisco Policy Builder. Use both interfaces.

To see dashboards that reflect function at the system level, see System Health Monitoring.

Overview of Operational Monitoring

Operational monitoring with Cisco Policy Suite lets you access real-time key performance data as a graph or chart. For example, performance data might be acquired from Diameter messages such as CCR-I or CCR-T. These message counters are displayed as a chart, helpful for troubleshooting.

Real-time monitoring charts allow the service provider to create their own charts to customize monitoring of their network.

First, use Cisco Policy Builder to configure data counters and dashboards.

Then, use Cisco Control Center to display those data.

   Counters and dashboards are configured in Cisco Policy Builder.

   The Cisco Policy Builder interface can provide:

      – Pre-configured KPI packages for Mobile, Wi-Fi, and BNG networks
      – Lists of counters and dashboards to choose from

   The display of dashboards and charts occurs in Cisco Control Center.

When performing operational monitoring, you can display one dashboard at a time in the main window. Choose from the list on the left the dashboard you want to display. But with the Detach functionality, you can display multiple dashboards at a time in separate browser windows.

Concepts for Operational Monitoring

Real-time monitoring allows you to access real-time key performance data as charts. Then, you can troubleshoot network issues as they occur, with help from the charts.
After your Cisco Policy Suite is installed and ready to take traffic, you can monitor the Diameter messages with the Monitoring tab. Diameter interfaces supported are Sy, Sh, Gx and so on.

Note
If troubleshooting, recall that as part of installation, several utilities inform data capturing and rendering in Cisco Policy Suite.
- `bulkstat_collections`—collects messages counters every five minutes
- `bulkstat_cleanup`—removes old records once a day
- `buldstat.cfg`—holds configuration variables for the utility
- `bulkstat_schema.sch`—holds schema name with collection name, which as the data for the schema.
The output is stored on a local server, typically `pcrfclient01`, in csv format. The location of this file is defined by `qns.conf`, with the variable `FILE_LOCATION` at `../tmp/bulkstats_files`.

The message counts in Cisco Control Center reflect the system load conditions based on message types and numbers.
The feature also allows for export of the real time data to external devices in CSV files and archived for Day2 historical KPI analytics tools.
The charts you view in the Cisco Control Center interface are configured in Cisco Policy Builder. Use both interfaces.
- Cisco Control Center and Cisco Policy Builder interfaces work together to provide custom key performance indicators and custom dashboards.
- Cisco Control Center collects the various Diameter messages and counters, and displays them in real-time dashboards in its interface.
- Use Policy Builder to configure counters and dashboards.
- Use Cisco Control Center to display dashboards. The dashboards viewed in Cisco Control Center reflect the setting configured in Cisco Policy Builder.
- Counter lists can have several counters in them. You can have one or many counter lists to display on a dashboard.
- Monitoring type counters define which counters contribute to a dashboard.
  If you do not see the proper information in your dashboard in Cisco Control Center, perhaps it has not been configured properly as a counter in Cisco Policy Builder.
- Configure counters and dashboards in Cisco Policy Builder. See Configure the Cisco Policy Builder Counters and Dashboards.

These steps are done first, and then need only be used infrequently, when you want to change counters or change the set up of your dashboards.
- Display the dashboards graphically with Cisco Control Center. See Cisco Control Center: Viewing a Dashboard and its Charts.

## Configure the Cisco Policy Builder Counters and Dashboards

**Step 1** Log in to Cisco Policy Builder and click Reference Data > Monitoring Configurations.
**Step 2** If you need to create new counters or dashboards, click the links in the main window under Create Child.
Step 3  If you need to change a current counter or dashboard, click a node in the tree on the left.

Configuring Counters

- Counters determine what Diameter messages is collected on a dashboard. Some familiar Diameter messages might be these
- RAR, RAA
- CCR, CCA, CCR-I, CCA-I, CCR-T, CCA-T, CCR-U, CCA-U,
- STR, STA, SLR, SLA, SSNR, SSNA,
- UDR, UDA,
- PUR, PUA,
- SNR, SNA,
- PNR, PNA.
Configure the Cisco Policy Builder Counters and Dashboards

Chapter 5      Operational Monitoring

Step 1  In Cisco Policy Builder, click Reference Data > Monitoring Configurations > Monitoring Counter Groups and select a counter list.

Step 2  Add a row to the Monitor Counters table. Click in the row/column and type.
You can type in any text in the Display Name column.
Select the counters themselves from the list in the Counter Name column.
Select several counters by using the control key.
The counters define what Diameter messages to collect. Our example uses these three counters on the chart named Gx Messages In:
- cisco.com_Gx_CCA-I
- cisco.com_msg_GxCCA-I
- cisco.com_msg_Gx_CCA-U
and this one counter in the chart named Gx RAR Messages Out:
- cisco.com_msg_Gx_RAR
All the counters for both charts are defined here.

Note  Recall that realms are configurable and defined with a plug-in for Cisco Policy Builder at Reference Data > Systems > system name > Plugin Configuration > Diameter configuration > Inbound Peers
and Reference Data > Systems > system name > Plugin Configuration > Diameter configuration > Outbound Peers
Deleting Counters

You cannot delete a counter if it is in use by a dashboard.

Step 1
Log in to Cisco Policy Builder.

Step 2
Click Reference Data > Monitoring Configurations > Monitoring counters > select a counter.

Step 3
Click the red x at the top of the tree to delete the counter.

Naming Conventions for Counters

The naming conversion of the counters is the concatenation of Realm, ApplicationID, Diameter CommandCode, and Action, separated by an underscore.

The following table lists the values of each field. The Realm, ApplicationID and CommandCode are extracted from the message itself. The action implies the operation of CPS on the message:

- **Bypass**—CPS received the message, but there is no need to process.
- **Sync**—the message is a part of synchronous operation, such as UDR/UDA to HSS.
- **Pe-submit-error**—the message can not be submitted to policy engine due to errors.
- **Send-x**—the message can not be sent to the IO manager in QNS due to errors.
- **Rate-limit**—the message is dropped due to the rate limit applied to the CPS, regardless of the message types.
- **Drop**—the message is dropped due the overload control in CPS, according to the rules defined in the Cisco Policy Builder Reference Data > system > Diameter Configuration > Message Handling Rule.

<table>
<thead>
<tr>
<th>Realms (Example)</th>
<th>Application ID</th>
<th>CommandCode</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sy</td>
<td>STR/STA/SLR/SLA/SSNR/SSNA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sh</td>
<td>UDR/UDA/PUR/PUA/SNR/SNA/PNR/PNA</td>
<td></td>
</tr>
</tbody>
</table>

Configuring Dashboards

Dashboards are built from counter lists and then display in Cisco Control Center as charts.

**Note**
If you change or delete a dashboard configuration in Cisco Policy Builder, a message is sent to anyone using that chart in Cisco Control Center.
### Step 1
In Cisco Policy Builder, click Reference Data > Monitoring Configurations > Monitoring Dashboards > and select a dashboard.

![Monitoring Dashboard](image)

<table>
<thead>
<tr>
<th>Short Name</th>
<th>This is a short name for the dashboard that displays in Cisco Control Center in the menu on the left.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>This field is a longer name for the dashboard that displays on the dashboard at the top.</td>
</tr>
<tr>
<td>Chart Table</td>
<td>This field defines what counters are in the chart and whether it is a line chart or an area chart. You can select either Line or Area as a display option after you log in to Cisco Control Center.</td>
</tr>
<tr>
<td>Title</td>
<td>This title represents one chart in a dashboard.</td>
</tr>
<tr>
<td>Chart Type</td>
<td>This field displays the chart as a line or area chart.</td>
</tr>
<tr>
<td>Monitoring Counters</td>
<td>This lets you select the counters used in a specific chart. These are represented in colors in the chart itself.</td>
</tr>
</tbody>
</table>

### Step 2
Add a row to the table.

In the Title column, you can type in any text. Just click in the row/column.
Configure the Cisco Policy Builder Counters and Dashboards

In the Chart Type column, use the drop-down list and select how to display the chart when viewing it in Cisco Control Center.

![Chart Type]

- Line
- Area

In the Counter Name column, click in the row, then click the icon on the right to select a counter or counter list to the dashboard.

![Monitoring Counters]

GX (Initial)

Step 3  Select a defined counter object from the list and click OK.

![Please select a 'MonitorCounter' object...]

SY/SY Counters
- UDR
- Sy

GX Counters
- GX (Initial)
- GX (Terminate)
- GX (Update)
- GX (RAR)

Step 4  Check your work by logging in to Cisco Control Center and viewing the dashboard.

Deleting Dashboards

Delete a dashboard in the Cisco Policy Builder interface. The delete is reflected on the Cisco Control Center screen.
You can delete dashboards from the Cisco Policy Builder interface at any time. If a Cisco Control Center user is viewing the dashboard when it is deleted, they receive a message, and this (deleted) dashboard being viewed in Cisco Control Center is removed. The list in the right side of the screen shows this change.

You cannot delete a counter at any time if it is in use by a dashboard.

---

**Step 1**  
From Cisco Policy Builder, click Reference Data > Monitoring Configurations > Monitoring counters > select a dashboard.

**Step 2**  
Click the red x at the top of the tree to delete the dashboard.

**Step 3**  
Proceed to Cisco Control Center: Viewing a Dashboard and its Charts.

**Step 4**  
The next time the chart refreshes in Cisco Control Center, the dashboard is absent.

---

**Cisco Control Center: Viewing a Dashboard and its Charts**

Recall that dashboards are created and edited in the Cisco Policy Builder. See Configure the Cisco Policy Builder Counters and Dashboards on page 2.

The Cisco Control Center interface renders the dashboard as chart.

---

**Note**  
If there is a change or deletion of a dashboard in Cisco Policy Builder, a message is sent to anyone using that chart in Cisco Control Center. You can notice the change at the next refresh. Note this message and click OK to go on.

---

**Displaying Dashboards as a Chart**

Dashboard details displayed in Cisco Control Center include these:

- A list of configured Dashboards appears on the left under the Monitoring header.
- A selected dashboard’s title appears in the content area’s header.

Click the range link to display a date range window under the header. You can set the date range as you wish.

All data applies the date range to all charts in the dashboard. Apply sets the date range to the chart in focus.

- Charts appear one on top of the other, below the time frame selection.

---

**Step 1**  
From the Cisco Control Center interface, click Monitoring tab > Monitoring node in the tree.
Step 2  Under the Monitoring node, find the dashboard you want to display and select it.

Step 3  The dashboard, as defined in Cisco Policy Builder, appears in the main window. This example shows the GX dashboard as defined in Cisco Policy Builder.

The top portion shows the Gx Messages In data.

The bottom portion shows the Gx RAR Messages Out.

The upper left shows the date and time this chart represents.

The upper right shows when the last refresh of data occurred, and how often the data is set to refresh.

- Click the range link to change the date and time range of the chart.
- Choose a refresh period to change the refresh interval.
Click the refresh link to force a refresh.

In the example charts for the Gx dashboard, notice that:

- In the area chart on top, three counters display in a legend at the bottom. Recall that these were configured in Cisco Policy Builder, in step 3 above. Because it is an area chart, they display as boxes.

- In the line chart at the bottom, the single counter you configured in step 3 appears in the legend. Because this is a line chart, the legend indicators display as lines.

- To highlight a counter in the chart, hover over the counter name at the bottom of a chart.
CPS Messages

You can see any messages which CPS sends or receives. This is helpful when diagnosing and troubleshooting.

The CPS engine log contains the details of the CPS responses, for example,

- CCA or an Access Accept
- External calls out of the system (ex: call to external AAA, Rx message)
- Synchronous responses (response from AAA message, Rx response)
- Send and receive messages
  - Diameter - send response, request.
  - RADIUS - send access accept/reject, COA

The engine logs are generated on the CPS servers. Use SSH to view them.

For an all-in-one server, look in:

10.94.251.85: /var/log/broadhop/qns-engine-1.log

In a full environment, look in:

/var/log/broadhop/consolidated-engine.log

---

Note

If you need more technical help, your Cisco technical representative can use an interface to facilitate troubleshooting engine logs.
Typical Tasks for Everyday

These navigation tasks and activities are specific to the operational monitoring dashboards in Cisco Control Center.

Refreshing the Screen with Auto Refresh

The Auto Refresh feature turns Auto Refresh on and off to let you compare data in graphs without the interference of a refresh.

In the header, to the right of the dashboard name is a down arrow icon. Click to display the Dashboard Options menu appears. This menu contains:

- The titles of the charts in the dashboard and a check box option. The check box toggles whether a chart is displayed or hidden.
- The Auto Refresh option turns auto refresh off and on.

Set auto refresh off and prevent updating a chart. This way you can freeze the chart and prevent the time span you are interested in from moving out of view as subsequent refreshes occur. That is, it prevents the data from aging out.

Set Auto Refresh on and the chart is refreshed as specified in the boxes for auto refresh intervals.

By default Auto Refresh is On. The interval of the auto refresh is every 60 seconds. You can change this interval through a Cisco Control Center server VM parameter in the qns.conf file.

**Note**

Recall that you can configure the auto refresh interval at the implementation level. Configure the auto refresh variable cc.monitoring.autorefresh.seconds in the qns.conf file. The minimum auto refresh rate is 3 seconds. Then, restart the system.

Refreshing the Screen Manually

The refresh link is in the upper right corner.

- Click the refresh link to force a refresh.
Typical Tasks for Everyday

- A successful refresh message appears on the right.

- The usual refresh time is every 60 seconds, and is refreshed from the server.
- In the middle of updating data, refresh is deferred.
- Upon close and reopen a table, the refreshed table is displayed.

Setting the Time Frame

Set the time frame specifically or use the refresh time buttons to refresh the data in your charts.
- Select time frame the chart displays. The time frame uses date and time as the start and end points of the data in the chart.
- This date range appears when the chart refreshes, and so moves along in time. That is, the data ages out and moves off the screen.

- You can set the date range, including times for the display of a chart.

To select a specific time period within your data capture period, click the range link at the top. This can help you narrow down the chart if you notice a problem and want to investigate it.

- Click on the line or area in the chart.
- Click on the legend at the bottom. You can show, highlight, or hide a particular area of data.
**Setting the Refresh Time**

Set the time frame specifically or use the refresh time buttons to refresh the data in your charts.

- The charts are refreshed every 60 seconds by default. But remember, for the Time Period buttons, the default is 30 minutes, meaning there is a retrieve of the last 30 minutes of data every 60 seconds.
- Select how often you want to refresh the time frame you selected on the left.
- When you select a refresh time, the time frame on the left is adjusted to match that.

---

**Note**

Cisco Control Center monitoring reflects real-time data with a short prelude. That is, the data on these monitoring screens ages out after one or two days. To see longer periods of historical data capture, comma-separated value files are available. These .csv files can provide performance data for recommendations about performance.

---

**Arranging the Screen Layout**

You can customize the layout of your charts to suit your needs. The windows are movable and re-sizeable. Your layout is saved even if you close the browser or close your session and come back later.

If you delete cookies, your layout cannot be recalled.

If you purposely want to clear your saved layouts, delete the cookie QNSCCMonitoring for the host.

- Charts are first displayed as a stack.
- Multiple charts can be open at one time. Only one dashboard can display at one time.
- Icons in the upper right corner of a chart minimize, maximize, or close the chart.
- To restore a chart for viewing, open the Dashboard Options menu and select a check box.
- Resize the chart with click and hold at the margin edges.
- Click in the chart’s heading and drag it to a new position.
Displaying Dashboard Menu

Display the Dashboard Options menu with a click on the down-arrow icon to the right in the header. At least one chart must be on the screen.

The Dashboard Options menu lets you:

- Select or deselect charts. Deselecting a chart removes it from view.
- Toggle on and off Auto Refresh. With Auto Refresh off, you can preserve the display of an area of interest on a graph.
- Detach a dashboard and send it to its own window.
  
  Return the dashboard to the monitoring screens by closing the detached window.
  
  Detaching a dashboard is browser independent.

The Auto Refresh rate is 60 seconds by default. Override this setting in the qns.conf file, specifying a value for the Control Center server VM parameter > cc.monitoring.autorefresh.seconds.

Final Tasks

- Practice all of these techniques before you face a performance issue or troubleshooting situation.
- Generate some graphs and dashboards and make sure they meet your needs.