



Policy Builder Overview

- [Converged policy and charging , on page 1](#)
- [Reference data, on page 1](#)
- [Services, on page 2](#)
- [Policies, on page 3](#)
- [Accessing the Policy Builder, on page 5](#)
- [Policy Builder Field Value Validation, on page 6](#)
- [Tarrif of the day, on page 6](#)
- [Gx based quota management, on page 11](#)

Converged policy and charging

CPC allows service providers to create policies that are customized to their particular business requirements through the use of the CPC Policy Builder, a web-based tool with a graphical user interface (GUI) that allows for rapid development of innovative new services.

The Policy Builder GUI supports both configuration of the overall CPC cluster of virtual machines (VMs) as well as the configuration of services and advanced policy rules. These sections introduces the main aspects of the PB GUI as laid out in three tabs on the upper right of the interface: Reference Data, Services and Policies.

Reference data

A reference data item is a system configuration element that

- provides access for configuring various aspects of the system to prepare it for operation
- supplies settings and parameters referenced by policy rules across multiple services, and
- enables reuse of configuration options such as account balances and notifications by different services as needed.

Reference data configuration options

The Reference Data tab contains static system, network, and template definitions. It is not directly related to policy, services, or use cases, but defines the reference points for the following types of information:

- Systems, cluster, and instance data
- Jdbc query string definitions
- Balance and quota definitions
- Diameter configuration, and CPC (Rest API - 5G) configuration
- Query strings
- Custom reference data tables (custom look up tables such as apn names)
- Notification addresses and text templates
- Policy reporting criteria
- Subscriber data repositories

Services

The creation of a new service begins with creating a Use Case Template (UCT) for the service. UCTs consist of Service Configurations that are specific to the service being created. For example, a Service Configuration might set up a Gx Rule or Basic QoS. The UCT is also used to configure Use Case Initiators (UCI), which are instructions describing when a specific Service Configuration should be in effect. An example of a UCI is only send this Gx Rule when the account balance is depleted. Multiple UCIs can be configured for each Service Configuration. This enables complex logic that determines when the configuration is active or inactive.

Once a UCT and associated UCIs are defined, it becomes the basis for Service Options, which are specific instances of the UCT that are populated with data specific to the service. Multiple Service Options can be created from a single UCT; for example, a UCT that provides for passing QoS parameters can be reused with different QoS values for different customers. Multiple Service Options can be layered to create the end Service.

Figure 1: Services tab

Service

*Code: SERVICE_A *Name: Service A ☒ Enabled ☐ Suppress In Portal

☐ Balance Service ☐ Add To Sub Accounts

Service Options

Name	*Use Case Template
1 Session Limit	Max Concurrent Sessions

Add Remove View Service Option Parameters

Actions

Create Child:
[Automatic Balance Provisioning](#)

Copy:
[Current Service](#)

The Domains panel within the Services tab handles the initial interaction of the client device with the policy engine, and covers tasks including client authentication, default provisioning of unknown clients and qualifying a client for particular system defaults and services.

Policies

Within the various Extension Points are Policies that define Conditions (events and data from the policy flow and external systems) that can then trigger Actions (manipulation of data and communication back to external systems).

Note that the configuration of services for most deployments will be handled through use of the Reference Data and Services tabs; advanced policies as defined on the Policies tab and discussed above are only required for complex deployments. It is recommended that only experienced users access the Policies tab as errors in custom policies can have negative impact on the operation of the system. Detailed discussion of custom policies is outside of the scope of this document.

By default, the Policies and Blueprint tabs are disabled.

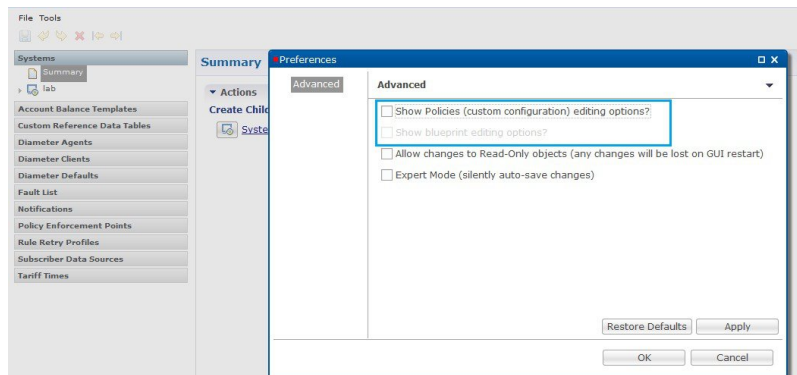
**Important**

The Policy Builder offers the Blueprint section under **Policies** tab to enable Cisco recommended changes to the Policy Engine. Changes made without Cisco guidance are not supported and can result in poor performance, platform instability, or reduced capacity.

Enabling Policies tab

In Policy Builder, **Tools > Preferences** to open **Preferences** pop-up window.

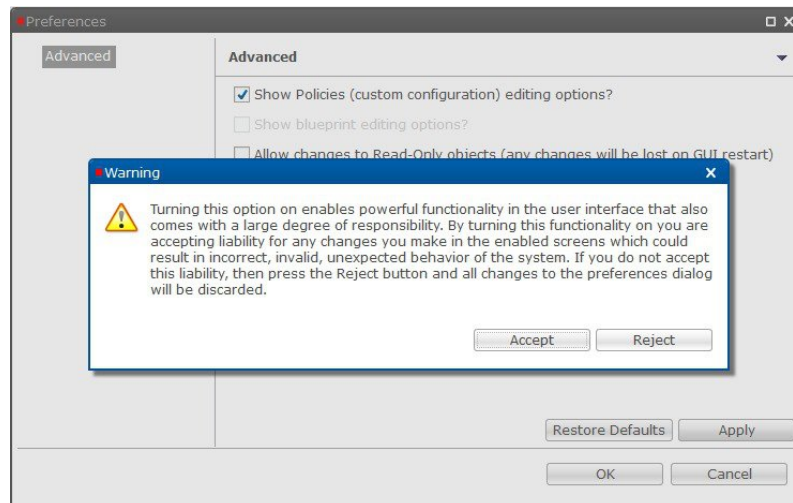
Figure 2: Preferences - Policies



Select **Show Policies (custom configuration) editing options?** and click **Apply**.

Warning pop-up dialog box opens up.

Figure 3: Warning



Click **Accept** so that **POLICIES** tab is visible in Policy Builder.

Enabling BLUEPRINTS tab

For **BLUEPRINTS** tab to be visible in Policy Builder, Show Policies (custom configuration) editing options? must be checked.

Select Show blueprint editing options? and click **Apply**.

Figure 4: Preferences - Blueprints 1

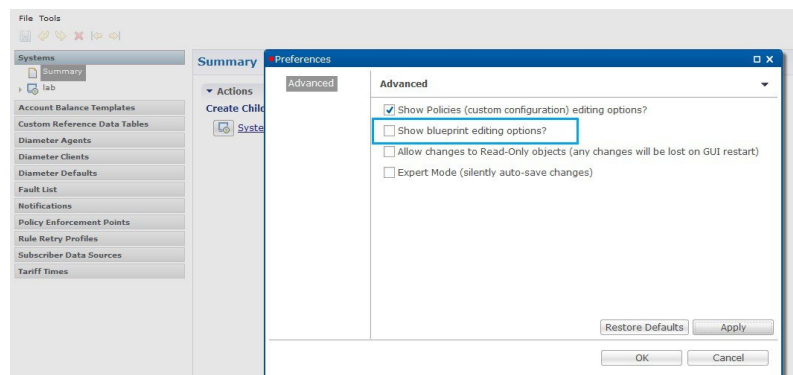
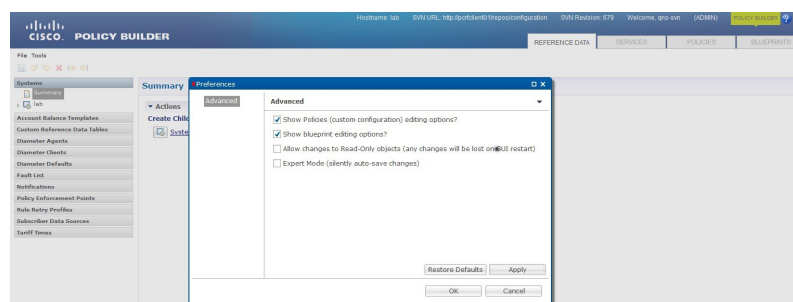


Figure 5: Preferences - Blueprints 2



Warning pop-up dialog box opens up.

Click **Accept** so that **BLUEPRINTS** tab is visible in Policy Builder.



Note In case the **POLICIES** checkbox is unchecked while **BLUEPRINTS** checkbox is checked, the **BLUEPRINTS** checkbox is unchecked forcefully and the **BLUEPRINTS** tab is not visible.

Summary of Policy tab capabilities

This reference provides an overview of the Policy tab capabilities, focusing on conditional rules, action triggers, and session data evaluation for policy decisions and service data return.

- Conditional rules within specified Extension Points (Condition/Action)
- Trigger specific actions from an extensive catalog of Use Case Initiators
- Evaluate and manipulate session data as part of making policy decisions and returning services data to downstream systems

Advantages

- Allows for handling complex policy situations without writing custom code.
- Support for custom or unusual business rules,

Considerations for building custom policies

- Building custom policies requires a deep understanding of the call flow and underlying CPC platform.
- Due to the flexibility of the Policy Builder, it is possible to create conflicting policies that can have a negative impact on system performance.

Accessing the Policy Builder

The Policy Builder is the web-based client interface for the configuration of policies to the Converged Policy and Charging. Initial accounts are created during the software installation with the default CPC install username as **qns-svn** and password as **cisco123**.

URL to access Policy Builder Interface:

- For HA: <https://<lbvip01>:7443/pb>

CPC enables users to be aware of its current privileges while accessing Policy Builder 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.

The hostname is displayed in the login dialog box and system banner to differentiate between open windows while performing any operation of the CPC 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

Enable TACACS+ authentication for Policy Builder by enabling PAM authentication (set **-DdisablePAMAuthentication** to false) and enabling TACACS+ along with `tacacs_on_ui` flag set to true in Configuration.csv file.

Policy Builder Field Value Validation

When you start the Policy Builder, the last recorded valid value defined in the eCore is set as the default value. If the value is not set in the eCore, the valid value is taken based on the eCore data type. For numeric data types, the Policy Builder displays 0 as a default value. For string data types, the Policy Builder displays null (empty) as a default value.

The Policy Builder validates the value that is configured in the field.

When you enter a value in the field and the value passes validation, the newly entered value is recorded as the last valid value. If the validation fails, the last recorded valid value is reverted.

Tariff of the day

Feature description

Table 1: Feature description

Feature Name	Release Information	Description
Tariff of the day	2026.03.0	The Tariff of the Day feature allows service providers to define and apply variable billing rates and different data rules for specific time intervals. This feature supports dynamic quota management and precise cost control. Service providers benefit from automated, time-based rate switching, which ensures subscribers are billed accurately based on pre-defined tariff periods.

Tariff Times

Tariff Times refers to the PCF terminology that defines rate structures and their applicable time periods. To determine the current TariffSwitchTime, Balance uses the current time, based on the time zone specified in the tariff time reference data configuration. It then checks each switch time from top to bottom to determine whether the current time matches a TariffSwitchTime. The Policy Control uses the first tariff switch time that matches, including any associated valid dates or a holiday date. The tariff switch time marks the end of the current tariff period. The system calculates the next tariff switch time by adding one second to the end of the current tariff switch time and then searching each tariff switch time from top to bottom to find the next match.

Rates

Rates allow service providers to change how quota is billed to customers. Typically, there is a one-to-one relationship: if a customer uses 1 MB, they are charged \$1 for that usage. Service providers can modify the rate to alter the cost subscribers pay for their quota usage. For example, with a rate of 0.25, the quota is billed at 1 MB for every 4 MB used. With a rate of 2, quota usage is billed at 2 MB for every 1 MB the customer uses.

The rate is specified when the system makes a reservation. The default rate is 1.

Tariff Times configuration- Rate specific usecase

This section explains how to set up rates for components that use Autowire Balance. Autowire Balance is the default blueprint for Balance. You must configure it in the Policy Builder for use in the base system setup. Autowire Balance extends the main system blueprint.

Complete these steps to configure tariff times and balance rates in the Policy Builder:

Procedure

Step 1

Configure tariff times:

- a) Navigate to **Reference Data > Tariff Times**.
- b) Create a new child entry and set the time zone if required.
- c) Define rows that cover a full 24-hour period.

Note

A start time of 00:00 (midnight) is inclusive, while an end time of 00:00 is exclusive. Using 00:00 as the end time ensures the system accounts for all 86,400 seconds (24 hours) in a day.

Figure 6: Tarrif Time

Tariff Time

Code
TariffExample

Timezone
US/Mountain

Tariff Switch Times

Name	*Start Time (hh:mm)	*End Time (hh:mm)	Tariff Time Identifier
OffPeak	00:00	12:00	OffPeak
Peak	12:00	00:00	Peak

Add Remove Up Down

Associated Valid Dates

Valid Days of the Week
☒ Monday ☒ Tuesday ☒ Wednesday ☒ Thursday
☒ Friday ☒ Saturday ☒ Sunday

Additional Valid Dates (Holidays)
 Add Remove

Step 2 Configure balance rate settings:

- Navigate to **Service > Use Case Templates**.
- Click **Add** in **Service Configuration** and select **BalanceRateConfiguration**.
- Choose an **Account Balance Template**.

Step 3 Configure rate parameters:

- In the **Rates List**, select a **Tariff Switch Time (Key)**.
- Modify the rate as needed.
- Click **Add Child** to add additional rate options.

Step 4 Configure service options:

- Navigate to **Services > Service Options > Rates**.
- Click **Create Child Service Option**.
- Click **Add** in **Service Configuration** and select **BalanceRateConfiguration**.

Figure 7: Service Option

Service

Name
Peak-OffPeak Example

Use Case Template: Rates

Service Configurations

*Display Name	Account Balance Template	Value	Pull value from...
Rates (List)			
Rate			
Tariff Switch Time (Key)	Peak		
Rate			
Tariff Switch Time (Key)	OffPeak		
Rate			
Usage Band	Band1		

Add Remove Up Down

Actions
 Copy: Current Service Option

Step 5 Choose **File > Publish to Runtime**.

Tariff Times configuration - TimeOfDay (ToD) usecase

By using Tariff Time configs, CPC also can install/uninstall the TimeOfDay Rules for the subscriber [ex. Unlimited Data Usage Rules during night or weekend] using Tariff Switch Times configuration. Sample configuration given below.

Complete these steps to configure tariff times and TimeofDay in the Policy Builder:

Procedure

Step 1 Configure tariff times:

- Navigate to **Reference Data > Tariff Times**.
- Create a new child entry and set the time zone if required.
- Define rows that cover a full 24-hour period.

Note

A start time of 00:00 (midnight) is inclusive, while an end time of 00:00 is exclusive. Using 00:00 as the end time ensures the system accounts for all 86,400 seconds (24 hours) in a day.

Figure 8: Tariff Time

Name	*Start Time (hh:mm)	*End Time (hh:mm)	Tariff Time Identifier
UL_Week_D	00:00	05:59	UL_Week_GHTS
UL_Week_N	20:45	23:59	UL_Night_GHTS
UL_Weekend	00:00	23:59	UL_Weekend_GHTS

Step 2 Configure TimeofDay rate settings:

- Navigate to **Service > Use Case Templates**.
- Click **Add** in **Service Configuration** and select **TimeofDay**.

Step 3 Select a Tariff Switch Time (Key).

- Navigate to **Services > Service Options > TimeofDay**, click **Create Child Service Option**, and select **TimeofDay** in the **Service Configuration**.
- Click **Add Child** to add one more Use Case Template to install Rule based on condition.
- Add condition to match **Tariff Time Code** which is mentioned in the Tariff Times Reference Data.

Step 4 Configure service options:

- Navigate to **Services > Service Options > TariffTime** Service option.
- Click **Create Child Service Option**.
- Click **Add** in **Service Configuration** and select **TimeofDay Configuration**.

Figure 9: Service Option

Figure 10: Use Case Option

Step 5 Choose **File > Publish to Runtime**.

Edge cases

It is strongly recommended that Tariff Switch Times cover all times during a 24 hour period and do not have gaps. Some customers use a default Tariff Switch Time entry that covers all the other times that have not been specifically defined.

Tariff Times are not allowed to cross over the midnight boundary for a given day. In practice, this means that often 2 or more tariff switch times must be created to cover a single logical period. For Example:

Edge case examples

Table 2: Edge case examples

Name	Start Time	End Time	Tariff Time Identifier
Nights Before Midnight	17:00	00:00	NIGHT
Nights After Midnight	00:00	07:00	NIGHT
Days	07:00	17:00	DAY

If a Tariff Switch occurs during a daylight savings time forward switch (i.e. between 2:00am and 3:00am during 'Spring Forward' in March), an error will occur in processing during that time since that hour is lost. Therefore, it is recommended that switch times NOT occur during these times on those days.

Gx based quota management

Overview

CPC supports Usage-Monitoring over Diameter Gx interface with different Balance Code, Dosage and monitoring level. Usage monitoring key Identifies the usage monitoring control instance.

Policy Builder configuration

Procedure

-
- Step 1** Login to CPC Policy Builder.
- Step 2** Configure the Account Balance Templates in the **Reference Data** tab. For more information, see Account Balance Templates.
- Step 3** Select the `Services` tab, and then click `Use Case Templates > Summary`.
- Step 4** Click **Use Case Template** link from the right side under **Create Child** to create a use case template.
- Enter the name for use case template. For example, name the new template as *UsageMonitoringKey*.
 - Click **Add** under **Service Configurations**.
Select Service Configuration dialog box opens, and all of the service configuration objects that are available are listed.
 - Scroll down to the **gx** area in the list of service configuration objects, and select the required usage monitoring object. For example, **UsageMonitoringKey**.
 - Select **Balance Code** in the UsageMonitoringKey parameter. Add other parameters as per the reference image. Map this Balance Code to the previously created **Account Balance Template**.

Figure 11: Usage monitoring schedule

Service Configuration Parameters (Preview)

*Display Name	Value
Priority	0
Diameter Client	
Encoding Format	false
Monitoring Key	1556
Dosage	52428800
Monitoring Level	1
Enabled	true
Balance Code	Unlimited_APP_Prepaid
Validity Period Minutes	60
Reporting Threshold	0
➤ Dosage Override (List)	
➤ DosageOverride	
Remaining Balance Below Megabytes	
Dosage Override Megabytes	
➤ Monitoring Schedule (List)	
➤ UsageMonitoringSchedule	

OK Cancel

Step 5 In the left pane of the Services tab, click **Services > Service Options** to create a service option and add the *UsageMonitoringKey* use case template.

Step 6 In the left pane of the **Services** tab, click **Services > Services** to create a service and add the configured *UsageMonitoringKey* use case template.