Plug-in Configuration

Overview

In CPS, reference data is considered information that is needed to operate the policy engine, but not used for evaluating policies. For example, in 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 this data only to process policies correctly. However, the data does not define the policy itself.

Cisco Policy Builder provides core plug-ins for customizing and optimizing your installation.

- Configurations set at the system level are system-wide except as noted in the bullet items below.

- Configurations set at the cluster level apply to that cluster and the instances in it. A value set here overrides the same value set at the system level.

- Configurations set at the instance level apply to the instance only and override the same value set at the cluster or system level.

Select the **Create Child** action in a **Plug-in Configuration** node in the **Systems** tree to define them. You can change any of the variables from the default, or choose not to use a plug-in, as necessary.

When you create a system from the example, the following configuration stubs appear at the cluster and instance level:

Figure 1: Create Child Action

Threading Configuration

A threading configuration utility is provided for advanced users and future development.

Click **Threading Configuration** in the right pane to add the threading configuration to the system. If you are planning to run the system with higher TPS, then you need to configure Threading Configuration. For further information, contact your Cisco Technical Representative.

The Threading Plug-in is for Mobility. The only value to set is **rules**. It controls the total number of threads in the Policy Engine that are executing at any given time. The default value is 50.

Never set it below 50, but it can be set higher to help increase performance in certain situations.

A configuration example is shown below:

Figure 2: Thread Pool Configuration
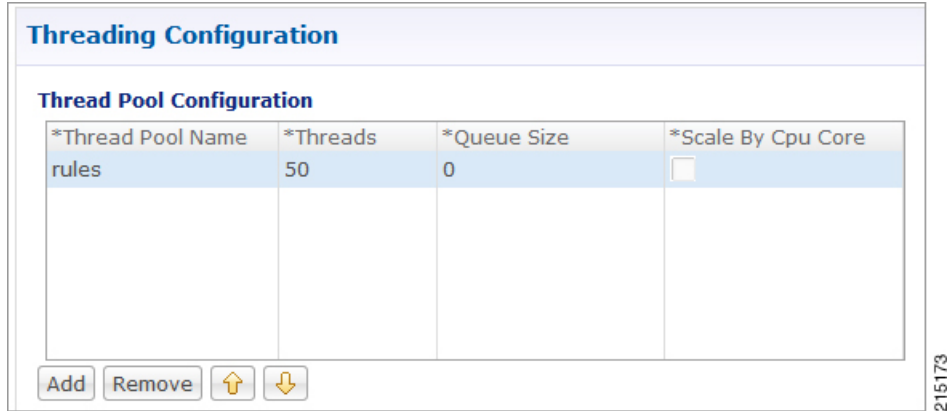
The following parameters can be configured under Threading Configuration:

Table 1: Threading Configuration Parameters

Parameter	Description
Thread Pool Name	Name of the Cisco thread pool.
Threads	Threads to set in the thread pool. You can set Rules Thread to 50/100 depending on call flow (based on number of lookup and per transaction round trip time). • rules = 50; Queue Size = 0; Scale By Cpu Core = unchecked • rules = 100; Queue Size = 0 (If TPS is > 2000 per Policy Server (QNS) depending on call model used; for example, if LDAP is enabled); Scale By Cpu core = unchecked
Queue Size	Size of the queue before they are rejected.
Scale By Cpu Core	Select this check box to scale the maximum number of threads by the processor cores.

Async Threading Configuration

You are always required to select this configuration, but no changes to it are necessary. Click **Async Threading Configuration** in the right pane to add the configuration in the system.

Use the defaults for the Async Threading Plug-in. Similar to the Threading Plug-in, the Async configuration controls the number of asynchronous threads operating in the Policy Engine. The Policy Engine handles two basic types of messages - synchronous and asynchronous. Synchronous messages block and expect a response. Asynchronous messages are sent into the Policy Engine but do not expect a response and therefore the Policy

Engine can defer those to worker threads that operate along side the main Policy Engine threading execution without causing too much traffic for performance.

✎

Note   Always select the link for Async Threading Configuration to configure your CPS system.

Figure 3: Async Threading Configuration

The following parameters can be configured under Async Threading Configuration.

Table 2: Async Threading Configuration

Parameter	Description
Default Processing Threads	The number of threads that are allocated to process actions based on priority.
Default Action Priority	The priority assigned to an action if it is not specified in the Action Configurations table.
Default Action Threads	The number of threads assigned to process the action if it is not specified in the Action Configurations table.
Default Action Queue Size	The number of actions that can be queued up for an action if it is not specified in the Action Configurations table.
Default Action Drop Oldest When Full	When checked, the oldest queued action is dropped from the queue when a new action is added to a full queue. Otherwise, the new action to add is ignored. This check box applies to all the threads specified in the fields above. To drop a specific thread, leave this unchecked and use the Action Configurations table.

| Parameter	Description
Action Configurations Table	
Action Name	The name of the action. This must match the implementation class name.
Action Priority	The priority of the action. Used by the default processing threads to determine which action to execute first.
Action Threads	The number of threads dedicated to processing this specific action.
Action Queue Size	The number of actions that can be queued up.
Action Drop Oldest When Full	For the specified action only: When checked, the oldest queued action is dropped from the queue when a new action is added to a full queue. Otherwise, the new action to add is ignored.

Custom Reference Data Configuration

Before you can create a custom reference data table, configure your system to use the Custom 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.

Click **Custom Reference Data Configuration** from right pane to add the configuration in the system.

Figure 4: Custom Reference Data Configuration
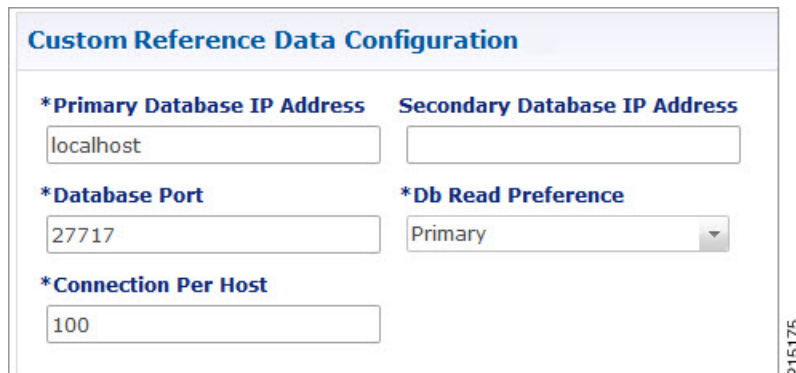
Here is an example:

- HA example:
    - Primary Database IP Address: sessionmgr01
    - Secondary Database IP Address: sessionmgr02
    - Database Port: 27717

- AIO example:
  - Primary Database IP Address: localhost or 127.0.0.1
  - Secondary Database IP Address: NA (leave blank)
  - Database Port: 27017

The following parameters can be configured under Custom Reference Data Configuration.

Table 3: Custom Reference Data Configuration

Parameter	Description
Primary Database IP Address	IP address of the primary sessionmgr database.
Secondary Database IP Address	Optional, this field is the IP address of a secondary, backup, or failover sessionmgr database.
Database Port	Port number of the sessionmgr. It should be the same for both the primary and secondary databases.
Db Read Preference	Read preference describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list: • Primary: Default mode. All operations read from the current replica set primary. • PrimaryPreferred: In most situations, operations read from the primary but if it is unavailable, operations read from secondary members. • Secondary: All operations read from the secondary members of the replica set. • SecondaryPreferred: In most situations, operations read from secondary members but if no secondary members are available, operations read from the primary For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.
Connection Per Host	Number of connections that are allowed per DB Host. Default value is 100.

For more information on Custom Reference Data API Usage, refer to the *CPS Operations Guide* for this release.

Balance Configuration

Click **Balance Configuration** in the right pane to add the configuration in the system.

Figure 5: Balance Configuration

The following parameters can be configured under Balance Configuration:

Table 4: Balance Configuration Parameters

Parameter	Description
Balance Database Primary IP Address	IP address of the sessionmgr database.
Balance Database Secondary IP Address	Optional, this field is the IP address of a secondary, backup, or failover sessionmgr database.
Database Port	This is required. This is the port the Balance database uses, that is, the port of sessionmgr.
Db Write Concern	Controls the write behavior of sessionmgr and for what errors exceptions are raised. Default option is OneInstanceSafe.

Parameter	Description
Db Read Preference	Read preference describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list:
	• Primary
	• PrimaryPreferred
	• Secondary
	• SecondaryPreferred
	For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.
Failover Sla Ms	This parameter is used to enter the amount of time to wait before starting failover database handling. The time is in milliseconds.
Max Replication Wait Time Ms	This option specifies a time limit, in milliseconds, for the write concern. This parameter is applicable only if you select TwoInstanceSafe in Db Write Concern.
	This parameter causes write operations to return with an error after the specified limit, even if the required write concern eventually succeeds. When these write operations return, MongoDB does not undo successful data modifications performed before the write concern exceeded the replication wait time limit. This time is in milliseconds.
Default Minimum Dosage Time Based	This field is optional but recommended.
	This is the minimum amount of time that is granted for a reservation, assuming quota is not exhausted.
	If you want to manage subscriber balances on the basis of time used, check with the network device administrator and have this value be slightly larger than the minimum amount of time the network device such as an SCE or ISG accepts for a reservation.
Default Minimum Dosage Volume Based	This field is optional but recommended.
	This is the minimum amount of volume that is granted for a reservation, assuming quota is not exhausted.
	If you try to make a reservation for 1 KB, and your minimum is 10 KB, the router rejects it because it is too small an amount to bother with.
Expired Reservations Purge Time (minutes)	The amount of time a record of expired reservations is retained and Cisco MsBM attempts to charge them. Note that expired reservations are charged only if sufficient quota is still available; that is, expired reservations do not retain the lock on quota that current reservations do.
	Default value is 0.

Parameter	Description
Recurring Refresh Max Delay (minutes)	The amount of time refreshing of recurring quotas are staggered across randomly, for sessions that are not actively using quota but are still established. This parameter is used in cases where subscribers always have a session, but might not be using their quota actively. This allows staggering of recurring refreshes where the customer has set all their subscribers to refresh at the same time, say midnight. It avoids spiking the CPU. Default value is 0.
Reduce Dosage on Threshold	When checked, reservation dosages are reduced as an Cisco MsBM threshold is approached. This way, a dosage does not pass a threshold by a large amount before notification of the breach is sent out. When unchecked, normal dosages is granted. Recall that when enabled, messaging becomes much more chatty, but threshold breach accuracy is enhanced.
Submit Balance Events To Reporting	Submits balance transaction to the policy engine, and these can be reflected in reporting.
Remote Database	
Name	String - Name of the remote database.
Key Prefix	Key prefix to be match for the remote database to be selected for lookup.
Connections Per Host	Number of connections that can be created per host. Default value is 5.
Db Read Preference	Read preference describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list: • Primary • PrimaryPreferred • Secondary • SecondaryPreferred For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.
Primary Ip Address	IP address of the remote sessionmgr database.
Secondary Ip Address	Optional, this field is the IP address of a secondary, backup, or failover sessionmgr database.
Port	Port number of the remote sessionmgr database. It should be the same for both the primary and secondary databases.

Parameter	Description
Backup Db Host On Local Site	String - The host name of backup database for remote balance for current site. Default value is sessionmgr01.
Backup Db Port on Local Site	The port number of backup database for remote balance for current site. Default value is 27719.

If you have a Geo-Redundancy setup, click **Backup Db Configuration**. It will store back up of entire balance records. In the event that the primary Balance DB goes down, CPS will check the balance record on both secondary and backup dbs, and take the latest version for processing.

Figure 6: Backup Db Configuration

The following parameters can be configured under **Backup Db Configuration**:

Table 5: Backup Db Configuration Parameters

Parameter	Description
Backup Db Host	Default value is sessionmgr01.
Backup Db Port	Default value is 27719.
Backup Db Monitor Interval In Sec	Used in thread which updates the primary balance DB (when primary balanceDB is available after fail over) with 'BackupBalance' db records. Default value is 3 seconds.
Rate Limit	Used to control the TPS (with how much TPS reconciliation should happen once primary balance db is up).

RADIUS Configuration

Click **RADIUS Configuration** in the right pane to add the configuration in the system.

Figure 7: RADIUS Configuration

The following parameters can be configured under RADIUS Configuration:

Table 6: RADIUS Configuration Parameters

Parameter	Description
Accounting Port	Port used for incoming radius accounting.
Authorization Port	Port used for incoming radius authorization.
Coa Port	Port used for Change of Authority between CPS and Radius Device.
Date Time Format	Time stamping format for radius transactions.
Location Db Host1	mongo location for Primary Radius DB.

Parameter	Description
Location Db Host2	mongo location for Secondary Radius DB.
Location Db Port	Port number for the Radius DB.
Accounting Enabled	Enables CPS to receive incoming Radius Accounting. Default value is True (checked).
Authorization Enabled	Enables CPS to receive incoming Radius Authorization. Default value is True (checked).
Coa Enabled	Enables CPS to send and receive CoAs.
Log Access Requests	Log the radius accounting which is configured in `/etc/broadhop/logback.xml`. The typical default logging location is `/var/broadhop/radius/accounting/accounting.current`.
Log Accounting	Logs radius authorization requests, also configured in `/etc/broadhop/logback.xml`. The typical default logging location is `/var/broadhop/radius/access/rejects.current`.
Disable Location Db	Will not record WLC locations in the Radius mongo DB. Default value is False (unchecked).

For information on Proxy Settings, refer to RADIUS AAA Proxy Settings, on page 27.

Voucher Configuration

Click **Voucher Configuration** in the right pane to add the configuration in the system.

Figure 8: Voucher Configuration

The voucher plug-in take the following defaults:

- HA example:
  - Primary: sessionmgr01
  - Secondary: sessionmgr02
  - Port: 27718

- AIO example:
  - Primary: localhost or 127.0.0.1
  - Secondary: NA (leave blank)
  - Port: 27017

The following parameters can be configured under Voucher Configuration:

Table 7: Voucher Configuration Parameters

Parameter	Description
Primary Database IP Address	The IP address of the Session Manager database that holds voucher information for Cisco Policy Builder and Cisco Policy Server.
Secondary Database IP Address	The IP address of the database that provides fail over support for the primary database. This is the mirror of the database specified in the Primary Database IP Address field.
Database Port	Port number of the sessionmgr. It should be the same for both the primary and secondary databases.
Disable Vouchers	Select the check box to disable voucher configuration.

Unified API Configuration

Click **Unified API Configuration** in right pane to add the configuration in the system.

Figure 9: Unified API Configuration

The following parameters can be configured under Unified API Configuration:

Table 8: Unified API Configuration Parameters

Parameter	Description
Fields To Wrap With Cdata Tags	This is a CSV separated string.
	The Unified API now can handle CDATA fields. Use the Plug-in configuration in Policy Builder to set CDATA fields for the main Unified API.
	The property `ua.cdata.fields` is used to set the fields that should be wrapped in CDATA tags for the client CommFactory to properly send and receive API requests.
	`-Dua.cdata.fields=networkId,password,data,oldNetworkId,oldPassword,newPassword` is the default.
Submit Requests To Audit Log	Select the check box to log requests to API in audit log.
	Default value is True (checked).
Submit Read Requests To Audit Log	Select this check box to log read requests in audit log.
	Default value is False (unchecked).

Notification Configuration

Notification in Cisco Policy Builder relates to pushing messages from Cisco Policy Builder to subscribers. Use messages to alert the subscriber to issues as well as opportunities on their network. Not only can you alert subscribers, but you can also send messages to any address you wish, perhaps system monitoring addresses.
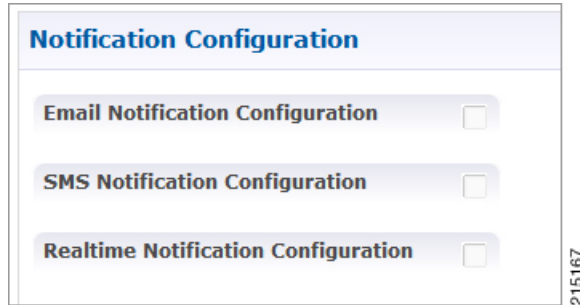
Currently, Cisco Policy Builder offers following notification types for Wi-Fi:

- Email (IMAP only)

- SMS notification (SMPP v 3.4)

- Realtime Notification

Click **Notification Configuration** in the right pane to add the configuration in the system.

Figure 10: Notification Configuration

The following parameters can be configured under **Notification Configuration**. For more information about these parameters, see the Notification Services chapter.

Table 9: Notification Configuration Parameters

Parameter	Description
Email Notification Configuration	Select this check box to configure the connection for an email notification.
SMS Notification Configuration	Select this check box to configure the connection for a SMS notification.
Realtime Notification Configuration	Select this check box to configure the connection for a realtime notification.

Audit Configuration

Click **Audit Configuration** in the right pane to add the configuration in the system.

Figure 11: Audit Configuration
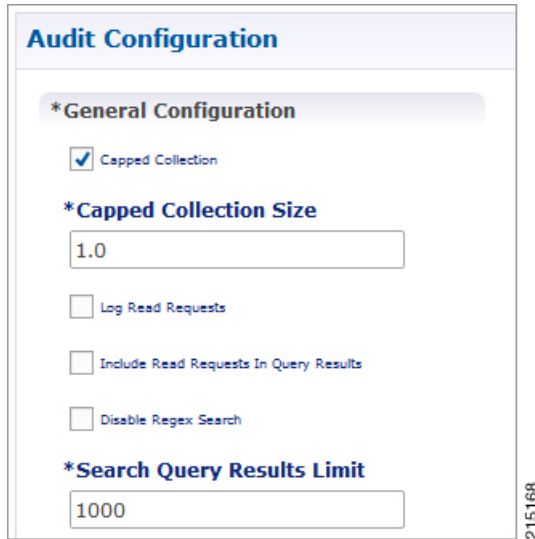
The following parameters can be configured in the **General Configuration** pane under Audit Configuration:

Table 10: Audit Configuration Parameters

Parameter	Description
Capped Collection check box	Select this check box to activate capped collection function.
Capped Collection Size	By default, the Audit History uses a 1 GB capped collection in MongoDB. The capped collection automatically removes documents when the size restriction threshold is hit.
	Configuration in Policy Builder is done in GB increments. It is possible to enter decimals, for example, 9.5 will set the capped collection to 9.5 GB.
Log Read Requests check box	Select this check box if you want read requests to be logged.
Include Read Requests In Query Results check box	Select this check box only if you want to include read requests to be displayed in query results.
Disable Regex Search check box	If you select this check box, the use of regular expressions for queries is turned off in the Policy Builder configuration.
Search Query Results Limit	This parameter limits the search results.

For more information related to other parameters like Queue Submission Configuration, Database Configuration, Shard Configuration under Audit Configuration, refer to the *CPS Operations Guide* for this release.

ISG Prepaid Configuration

The ISG Prepaid Plug-in Configuration is used to configure the ports for ISG Prepaid, a feature of the Cisco Intelligent Services Gateway.

Click **ISG Prepaid Configuration** in the right pane to add the configuration in the system.

Figure 12: ISG Prepaid Configuration

The following parameters can be configured under ISG Prepaid Configuration:

Table 11: ISG Prepaid Configuration Parameters

Parameter	Description
Accounting Port	Determines the port where CPS will receive prepaid accounting information.
Authorization Port	Determines the port where CPS will receive prepaid authorization.
Accounting Enabled	Select this check box to enable accounting. Default value is True (checked).
Authorization Enabled	Select this check box to enable authorization. Default value is True (checked).

For more information on installation and configuration of ISG Prepaid Configuration plug-in, refer to ISG Prepaid.

USuM Configuration

Click **USuM Configuration** from right pane to add the configuration in the system.

Figure 13: USuM Configuration

The following parameters can be configured in the **Spr Configuration** pane under USuM Configuration:

Table 12: USuM Configuration Parameters - 1

Parameter	Description
Spr Configuration	
Disable Regex Search	Mostly for SP Wi-Fi we use email ID which has realm, username, and so on as key of SPR. So, part of the string needs to match for regex support.
Enable Avp Regex Search	For regex search on values for AVP for SPR.
Exclude Suspended Subscribers From Policy	In case of subscriber state is Suspended, SPR will not validate IMSI.
Search Query Results Limit	Used to limit search if we are not passing any IMSI/MSISDN (NetworkID) in control center to list subscriber. Default value is 1000.
Max Number Of Locations To Store In History	It is used to track subscriber last location to maintain history, max "n" last locations will be stored as location history.

Parameter	Description
Last Visited Date Threshold	This parameter is used to identify if the user is visiting same location again (based on your location history) then it will change the last visited date if current visited date is more than last visited date + "n" days defined here.

Figure 14: Policy Engine Submission Configuration

The following parameters can be configured in the **Policy Engine Submission Configuration** pane under USuM Configuration:

Table 13: USuM Configuration Parameters - 2

Parameter	Description
Enable check box	Leave it to default.
Message Queue Size	Queue to hold data to generate internal SPR Refresh events for policy engine during Create, Update, Delete of subscriber.
Message Queue Sleep	Sleep before popping next batch for generating SPR Refresh events for policy engine for RAR processing.
Message Queue Batch Size	Batch size for fetching number of subscriberIds in one go for generating SPR Refresh events for policy engine for RAR processing.
Message Queue Pool Size	Message queue pool size to consume the data from queue and generate SPR Refresh events.

Parameter	Description
Notification Rate Limit	Rate limiting for generating SPR Refresh events. SPR Refresh events is used to generate RAR for active session where subscriber data has been change.

Figure 15: Database Configuration

The following parameters can be configured in **Database Configuration** pane under USuM Configuration:

Table 14: USuM Configuration Parameters - 3

Parameter	Description
Database Configuration	
Use Minimum Indexes	It is used to decide what all indexes need to be created on SPR collection by default, and here we need all the indexes to be created (We can check this when subscriber is very low, for example, less than 50K). Default value is unchecked.
Db Write Concern	Controls the write behavior of sessionmgr and for what errors exceptions are raised. Default option is OneInstanceSafe.

Parameter	Description
Db Read Preference	Read preference describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list: • Primary • PrimaryPreferred • Secondary • SecondaryPreferred For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.
Failover Sla Ms	This parameter is used to enter the amount of time to wait before starting failover database handling. The time is in milliseconds.
Max Replication Wait Time Ms	This option specifies a time limit, in milliseconds, for the write concern. This parameter is applicable only if you select TwoInstanceSafe in Db Write Concern. This parameter causes write operations to return with an error after the specified limit, even if the required write concern eventually succeeds. When these write operations return, MongoDB does not undo successful data modifications performed before the write concern exceeded the replication wait time limit. This time is in milliseconds.
Shard Configuration	
Primary Ip Address	String - Primary Host Address.
Secondary Ip Address	String - Secondary Host Address.
Port	Default value is 27720.

Figure 16: Remote Database Configuration

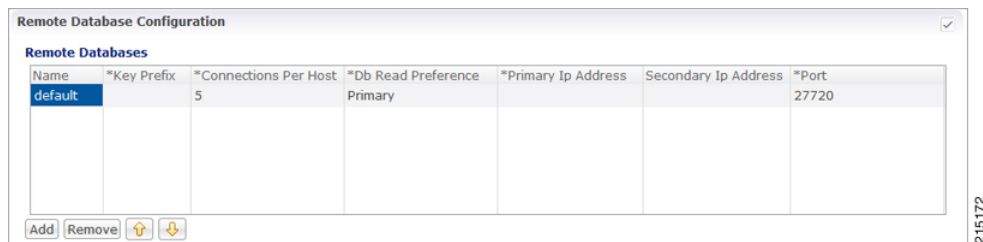Click **Add** to add a new row on the **Remote Database Configuration** pane. The following parameters can be configured in the **Remote Database Configuration** pane under **USuM Configuration**:

Table 15: USuM Configuration Parameters - 4

Parameter	Description
Name	String - Name of the remote database. **Note** Remote database name should be same as site name configured in `-DGeoSiteName` in `/etc/broadhop/qns.conf` file. This is needed to see the correct sites's subscriber in control center, when multiple SPR is configured.
Key Prefix	Key prefix to be match for the remote database to be selected for lookup.
Connections Per Host	Number of connections that can be created per host. Default value is 5.

Db Read Preference	Read preference describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list:
	
	   • Primary
	
	   • PrimaryPreferred
	
	   • Secondary
	
	   • SecondaryPreferred
	
	For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.

Primary Ip Address	IP address of the remote sessionmgr database.
Secondary Ip Address	Optional, this field is the IP address of a secondary, backup, or failover sessionmgr database.
Port	Port number of the remote sessionmgr database. It should be the same for both the primary and secondary databases. Default value is 27720.

Scheduled Events

The Scheduled Events plug-in is configured in the Policy Builder to implement offline notifications and SPR cleanup. Offline notifications send an SMS notification to an off-line subscriber indicating that their quota is about to expire. SPR cleanup allows you to delete subscriber data that is no longer needed or valid. For example, a subscriber account no longer has any services assigned to it, and therefore should be deleted from the database.

Enable Scheduled Events

To enable the scheduled events framework, this feature has to be enabled in the feature set of Policy Server and Policy Builder. The following packages, when added to the respective servers, deploy the functionality of scheduledEvents during a session:

- In the Policy Builder – com.broadhop.client.feature.scheduledevents package is added.

- In the Policy Server – com.broadhop.scheduledevents.service.feature package is added.

To add **Scheduled Events Configuration**, perform the following steps:

Step 1 If this is HA environment, edit the corresponding features files in Cluster Manager VM:
In the `/var/qps/current_config/etc/broadhop/pb/features` file, add the following line:

`com.broadhop.client.feature.scheduledevents`

In the `/var/qps/current_config/etc/broadhop/pcrf/features` file, add the following line:

`com.broadhop.scheduledevents.service.feature`

Step 2 If this is AIO environment, edit the features files in Cluster Manager VM:
In the `/var/qps/current_config/etc_aio/broadhop/pb/features` file, add the following line:

`com.broadhop.client.feature.scheduledevents`

In the `/var/qps/current_config/etc_aio/broadhop/pcrf/features` file, add the following line:

`com.broadhop.scheduledevents.service.feature`

Step 3 After modifying the feature files, execute the following commands:
`/var/qps/install/current/scripts/build_all.sh`

`/var/qps/install/current/scripts/upgrade/reinit.sh`

Note `reinit.sh` executes puppet on AIO and also checks if it is executed successfully.

Scheduled Events Configuration

Step 1   Click **Scheduled Events Configuration** in the right pane.

Step 2   In the **Scheduled Event Configuration** pane, enter values for the fields provided. The following figure shows an example.

Figure 17: Scheduled Events Configuration
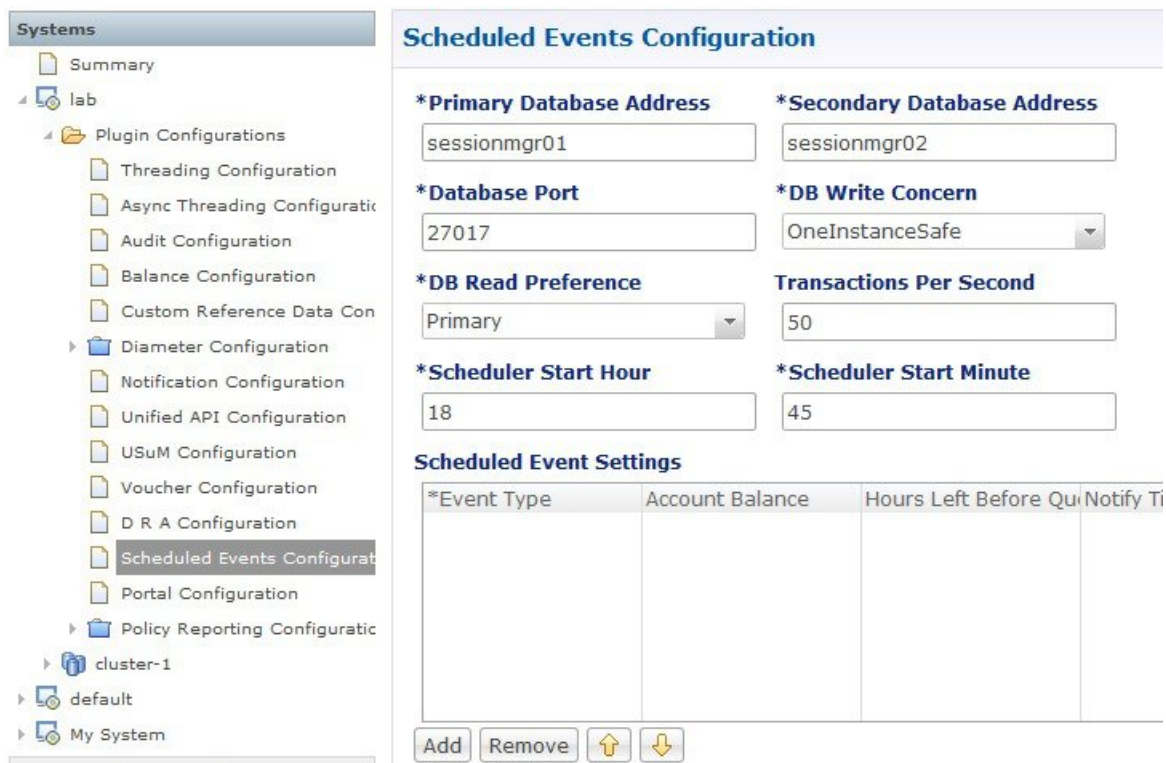
The following table describes the parameters that can be configured under **Scheduled Events Configuration**.

Table 16: Scheduled Events Configuration Parameters

Parameter	Description
Primary Database Address	The IP address of the sessionmgr database.
Secondary Database Address	The IP address of a secondary, backup, or failover sessionmgr database.
Database Port	The port used by the database; this is the sessionmgr port.
DB Write Concern	Controls the write behavior of sessionmgr and for what errors exceptions are raised. Default: OneInstanceSafe

Parameter	Description
DB Read Preference	Describes how sessionmgr clients route read operations to members of a replica set. You can select from the following drop-down list: • Primary – Default mode. All operations read from the current replica set primary. • PrimaryPreferred – In most situations, operations read from the primary but if it is unavailable, operations read from secondary members. • Secondary – All operations read from the secondary members of the replica set. • SecondaryPreferred – In most situations, operations read from secondary members but if no secondary members are available, operations read from the primary. For more information, refer to http://docs.mongodb.org/manual/core/read-preference/.
Transactions Per Second	Controls the maximum number of internally generated transactions per second that the system will produce.
Scheduled Start Hour	The hour at which the event is triggered. The value specified should be in the range of 0 to 23 (24-hour format).
Scheduled Start Minute	The minute at which the event is triggered. The value specified should be in the range 0 to 59.
Event Type	The type of event that will be triggered. You can select either of the following: **QuotaExpiration** – The scheduled event will be triggered when the system detects that a subscriber's quota is going to expire within the number of hours specified in the **Hours Left Before Quota Exhausts** parameter. **SubscriberInactivity** – The scheduled event will be triggered when the system detects that a subscriber is inactive. If you select this event type, the **Hours Left Before Quota Exhausts** and **Notify Time in Hours** parameters are ignored.
Account Balance	Processes only those subscribers whose account balance is specified in the configuration. Other subscribers are ignored. The **Account Balance** and **Service** parameters filter for subscribers having the configured balance and service. If these columns are not specified, the event processes all subscribers.

Parameter	Description
Hours Left Before Quota Exhausts	Used only with the QuotaExpiration event type. This parameter specifies the number of hours before the subscriber's quota expires. The system checks this field in the scheduled events loop and looks for quotas that are about to expire within the number of hours specified. If the number of hours before expiration is less than the value in this column, then subscribers with that quota will be added to the eventsCollection in the ScheduleEvents mongo database. For example, if this value is 8, when the scheduled events task runs, any subscribes who have the service specified and whose quota will expire in less than 8 hours will be added to the eventsCollection. Once in eventsCollection, new actions are taken for that subscriber depending on scheduled event configuration.
Notify Time in Hours	Used only with the QuotaExpiration event type. This parameter specifies the number of hours before a notification is sent to the subscriber. This parameter is used in conjunction with the **Hours Left Before Quota Exhausts** parameter. When this number is reached, CPS submits a QuotaExpiredEvent to the policy engine with the subscriber's balance information. When this occurs, the state of the entry in the eventsCollection changes to "notified." For example, if **Hours Left Before Quota Exhausts** = 8 and **Notify Time in Hours** = 4, an entry is created with the subscriber's balance information in the eventCollections 8 hours prior to quota expiration, and a QuotaExpiration event is submitted to the policy engine 4 hours before expiration. You can set up polices to send out notifications when this event occurs; for example, you might set up scheduled events to send out notifications 8 hours, 6 hours, 4, hours, and 2 hours before a subscriber's quota expires, reminding the subscriber to "top up."
Service	Processes only those subscribers who have the configured service associated. Other subscribers are ignored. The **Account Balance** and **Service** parameters filter for subscribers having the configured balance and service. If these columns are not specified, the event processes all subscribers.
Max Number of Days	Used only with the SubscriberInactivity event type. This parameter specifies the duration in days to retain the subscriber in the inactive state. If the status of a subscriber remains inactive for longer than the configured maximum number of days, the subscriber is automatically deleted from the database.

Parameter	Description
Command	A string value that is used to provide additional information about the event that is being submitted. This string can be used in the polices that look for events submitted to the policy engine.
	For example, when used with a QuotaExpiration event type, the command could be set to "8 hours" or "6 hours," or to any other string. A policy can use this string in its condition parameters to send one notification as opposed to another, or to take one action as opposed to another.

RADIUS AAA Proxy Settings

Click **RADIUS AAA Proxy Settings** to add the configuration in the system. These proxy settings are used for domain-based subscriber authorization.

Table 17: RADIUS AAA Proxy Settings

Parameter	Description
RADIUS Server	Server Identification which will be mapped between Proxy Settings and Domain/Service.
Accounting Port	AAA Server Accounting Port which will receive and process accounting requests.
Authorization Port	AAA Server Authorization Port which will receive and process authentication requests.
Primary IP Address	Primary AAA Server IP address.
Secondary IP Address	Secondary AAA Server IP address.
RADIUS NAS IP Address	NAS IP address which will be sent in the proxied requests.
RADIUS Auth Protocol	RADIUS authentication protocol used. Default: PAP
RADIUS Password	RADIUS authentication password.
Retries	Number of times the requests will be retried in a failure scenario.
Shared Secret	Shared Secret of the AAA Server.
Test User Id	RADIUS username used for testing between CPS and AAA Server.
Test Password	RADIUS password used for testing between CPS and AAA Server.

Parameter	Description
Thread Pool Size	Number of threads to handle proxying of requests.
Max Proxy Queue Size	Maximum number of requests that can be queued before being proxied.
Send Test Message	Select this option to send a test message to the AAA server when CPS comes up.