Configuring the Quota Manager

Introduction

This chapter describes how to configure the Cisco Service Control Quota Manager. This chapter contains the following sections:

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- Configuring the Cisco SCA BB Application, page 3-10

Configuring the Cisco Service Control Quota Manager

This section describes how to configure the Cisco Service Control Quota Manager. You must properly configure the Cisco SCE platform and the Cisco Service Control Subscriber Manager.

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- Configuring the Cisco Service Control Quota Manager in the Cisco Service Control Subscriber Manager, page 3-2
- Restrictions for Configuring the Quota RDR Server, page 3-8
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Configuration Guidelines

When configuring the Cisco Service Control Quota Manager, ensure that the following conditions are met:

- Anonymous subscribers should be assigned to a package that is not managed by an external quota server.
- For different packages, it is possible to configure external or internal quota management modes. However, packages with internal quota management should not have a quota profile configured in the Cisco Service Control Quota Manager. Quota indications are issued for internal quota management packages (for billing purposes), and the quota manager ignores them if no quota profile is assigned for them.

- Buckets labeled "Number of Sessions" should be assigned a dosage value that is equal to the maximum bucket size. Indications that the quota is below the threshold are not generated for this type of bucket, so quota provisioning cannot be split into dosages (otherwise, the subscriber would become breached between subsequent dosage provisions).

- You must configure the threshold value of the quota below the threshold indication to a value lower than the minimum quota dosage of all volume buckets.

Note For the Cisco Service Control Quota Manager to properly function, you must add the IP address of the machine that the Cisco Service Control Quota Manager is running on to the /etc/hosts file.

Configuring the Cisco Service Control Quota Manager in the Cisco Service Control Subscriber Manager

The Cisco Service Control Quota Manager is configured with the p3qm.cfg configuration file, which resides in the *sm-inst-dir* /sm/server/root/config directory (*sm-inst-dir* refers to the SM installation directory). Additionally, the Cisco Service Control Quota Manager is configured with additional parameters in the p3sm.cfg configuration file in the [Quota Manager] section of the file. The p3sm.cfg configuration file resides in the *sm-inst-dir* /sm/server/root/config directory (*sm-inst-dir* refers to the SM installation directory).

The configuration files consist of sections headed by a bracketed section title, for example [Quota Profile.<QUOTA-PROFILE-NAME>]. Each section contains the definition for one quota profile given by *QUOTA-PROFILE-NAME* and consists of several parameters having the format parameter = value. The pound sign (#) at the beginning of a line signifies that it is a remark.

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Configuring the Quota Profile Settings

The [Quota Profile.QUOTA-PROFILE-NAME] section in the Cisco Service Control Quota Manager configuration file contains the following parameters:

- packages—The list of package IDs associated with the quota profile. The package values are listed as a comma-separated list of package ID values. If the profile is used as penalty profile, only one package can be defined.

  There is no default value for this parameter.

- bucket_size—The comma-separated list that defines, for each bucket, the quota limits within an aggregation period. You must arrange the list in such an order so that the first number is for bucket 1, the second number is for bucket 2, and so on. The units must also be of the correct corresponding type such as Volume (Layer 3 kilobytes) or Number of Sessions. The minimum bucket size is 0, and the maximum bucket size is 2147483647. In a multiple-thresholds scenario, this parameter defines the threshold at which a subscriber is moved to the penalty profile.

For multiple bucket quota provisioning with the penalty profile, the number of penalty profiles and the number of buckets must be the same. If it is penalty profile, the number of buckets should be the same in all the quota profiles in the penalty chain.

There is no default value for this parameter.

- dosage_sizes—The comma-separated list that defines how much quota should be in each bucket after each quota provisioning operation. You must order the list in the same way as the bucket_size parameter and the list must be of the same length. The minimum dosage size is 0 and the maximum is 1048576 (1 GB Layer 3 kilobytes or 1 million sessions). Setting this parameter to a very low value causes a high rate of updates to and from the SCE. Setting this parameter to a very high value causes inaccuracy of quota in the event of a failure.

  There is no default value for this parameter.

- aggregation_period—Defines the aggregation period; this is, the period of time for which an amount of quota or number of sessions is granted to the subscriber.

  The "none" value means that the period of time is not bound to an aggregation period, and that the quota is not replenished automatically. Quota can be replenished manually by using the command-line utility (CLU).

  Possible values are minutes, hourly, daily, weekly, monthly, or none.

  For minutes type, the format is *n* minutes and the minimum value is 30.

  The default value is daily.

- day_of_month—Defines the day of the month the aggregation period starts.

  Possible values for this parameter are from 1 to 31. The default value is 1.

Note   This parameter is valid only if aggregation_period is set to monthly.

- day_of_week—Defines the day of the week the aggregation period will start.

  Possible values are sunday, monday, tuesday, wednesday, thursday, friday, or saturday. The default value is sunday.

Note   This parameter is valid only if aggregation_period is set to weekly.

- time_of_day—Defines the time of day at which the aggregation period starts. This parameter is applicable for all values of aggregation_period.

  The format of this parameter is HH:mm, where the hours portion is based on a 24-hour clock.

  Possible values are hours from 0 to 23, minutes from 0 to 59. The default value is 00:00.

Note   If aggregation_period is set to hourly, only the minute value is relevant.

- gap—Defines the distribution of the aggregation period start time between different subscribers. Distributing the aggregation period start times helps to avoid bursts of network activity when a new aggregation period begins.

  Possible values are from 0 to 100, where a gap of 0 means that the aggregation period starts at the same time for all subscribers (no distribution) and a gap of 100 means that the aggregation period start time is uniformly distributed over the entire aggregation period.

  The default value is 0.

For example, if the aggregation period is daily and starts at midnight (00:00), a gap of 50 means that the update messages are sent between midnight and mid-day (12:00). If the gap is 25, the update messages are sent between midnight and 06:00.

- penalty_period—The length of the penalty period, in minutes, associated with the quota profile. Applicable if the current profile is used as the penalty profile. The penalty period must be expressed as a product of the slice period. This parameter is optional. The penalty_period parameter has no default value.

Note If you use a monthly penalty profile, we recommend that you set the penalty period lower than the aggregation period.

- penalty_profile—The name of the quota profile that holds the definition of the package and quota for the penalty period. This parameter can be set to NONE only if it is present in the last penalty profile in the chain. This parameter is mandatory for a penalty profile. The penalty_profile parameter has no default value. For multibucket penalty support, the number of penalty profiles, and the number of buckets should be same. Penalty profiles should be separated using a comma (,).

Note The bucket size value of the penalty_profile parameter should not be greater than the bucket size value of the base profile.

- post_penalty.*<threshold>*=*<Quota Profile Name>*—The post-penalty map that defines the quota profile to which the subscriber is moved if the usage during the last penalty period or aggregation period (if, handle_out_of_penalty_on_aggregation_period_end = true) is lower than the threshold.

  If multiple quota bucket with the penalty profile is being used, the thresholds may be provided as either a percentage of quota usage or as the number of quotas used. The postpenalty configuration may be any the following:

  - post_penalty.[*<threshold1>*|*<threshold2>*|*<threshold3>*]=*<Quota Profile Name>*—When the threshold values are in percentage form.
  - post_penalty.*<threshold1>*|*<threshold2>*|*<threshold3>*=*<Quota Profile Name>* —When the threshold values are in numerical form.

If multiple post penalty parameters are configured, the value of threshold should be configured from low to high.

Note Do not define a postpenalty profile for the START profile in a profile chain; define only the penalty profile. However, you must define both the penalty profile and the postpenalty profile for the MIDDLE profiles. Define the penalty profile as NONE for the LAST profile, and define any postpenalty profile.

- slice_period—The defined slice period, in minutes. This parameter is optional.

  This parameter is valid only when the aggregation_period parameter is set to minutes, hourly, daily or weekly. The minimum value is 10.

  When the aggregation period parameter is set to monthly or none (infinity), the slice_period parameter should not be used or should be set to a default value of -1. Default value means a slice period is equal to the aggregation period (backward compatible).

Note that the following limitations are applicable while configuring multiple penalty quota profiles:

- The aggregation period must be the same for all the profiles that are a part of a penalty chain.
- The *none* keyword is not applicable.

Configuring the Quota Profile—Examples

This section contains the following examples:

Example 1: Simple Quota Profile with Weekly Aggregation Period

```
[QuotaProfile.QP1]
packages=1,2
bucket_sizes=1008, 2040, 3000
dosage_sizes=100,200,300
aggregation_period=weekly
day_of_week=monday
time_of_day=00:00
gap=10
slice_period=420
```

Example 2: Simple Quota Profile with Minutes Aggregation Period

```
[QuotaProfile.QP2]
packages=3,4
bucket_sizes=1002, 2004, 3000
dosage_sizes=100,200,300
aggregation_period=60 minutes
time_of_day=00:00
gap=10
slice_period=10
```

Example 3: Simple Quota Profile with Hourly Aggregation Period

```
[QuotaProfile.QP3]
packages=5
bucket_sizes=1002, 2001, 3000
dosage_sizes=100,200,300
aggregation_period=hourly
time_of_day=00:01
gap=10
slice_period=20
```

Example 4: Simple Quota Profile with Daily Aggregation Period

```
[QuotaProfile.QP3]
packages=5
bucket_sizes=1008, 2040, 3000
dosage_sizes=100,200,300
aggregation_period=daily
time_of_day=01:00
gap=10
slice_period=60
```

Example 5: Multiple Penalty Quota Profile with Minutes Aggregation Period

```
#QP11 is the root profile in the penalty profiles chain

[QuotaProfile.QP11]
packages=11
bucket_sizes=510
dosage_sizes=510
aggregation_period=90 minutes
penalty_period=none
penalty_profile=QP22
slice_period=30

[QuotaProfile.QP22]
packages=22
bucket_sizes=1002
dosage_sizes=1002
aggregation_period=90 minutes
penalty_period=180
penalty_profile=QP33
post_penalty.500=QP11
slice_period=30

[QuotaProfile.QP33]
packages=33
bucket_sizes=1002
dosage_sizes=1002
aggregation_period=90 minutes
penalty_period=270
penalty_profile=none
post_penalty.500=QP11
post_penalty.1000=QP22
slice_period=30
```

Example 6: Multiple Penalty Quota Profile with Monthly Aggregation Period Without Sliding Window

```
#QP11 is the root profile in the penalty profiles chain

[QuotaProfile.QP11]
packages=11
bucket_sizes=153600
dosage_sizes=51200
aggregation_period=monthly
penalty_period=none
penalty_profile=QP22


[QuotaProfile.QP22]
packages=22
bucket_sizes=153600
dosage_sizes=51200
aggregation_period=monthly
penalty_period=1440
penalty_profile=QP33
post_penalty.5000=QP11

[QuotaProfile.QP33]
packages=33
bucket_sizes=153600
dosage_sizes=51200
aggregation_period=monthly
penalty_period=1440
```

```
penalty_profile=none
post_penalty.5000=QP11
post_penalty.10000=QP22
```

Configuring the Quota RDR Server Section

You can move the RDR formatter to the Cisco Service Control Subscriber Manager from the EM-Agent, which is in the Cisco SCE. This improves the quota RDR handling rate. The Quota RDR Server section in the Cisco Quota Manager configuration file should be configured for this feature to operate.

If you move the RDR formatter to the Cisco Service Control Subscriber Manager, SM becomes the quota RDR server and every Cisco SCE connected to the quota RDR server becomes a client to the Cisco Service Control Subscriber Manager.

Note To use this feature, you must configure RDR formatter as Cisco Subscriber Manager on your Cisco SCE with the default port number as 32145. In Cisco Service Control Subscriber Manager cluster topologies, the VIP of Cisco SM cluster should be used instead of Cisco SM IP.

The [Quota RDR Server] section in the Cisco Quota Manager configuration file contains the following parameters:

- start—Defines whether or not to start the Quota RDR server. Possible values are yes and no. The default value is no.

- ip—Defines the IP address of the Quota RDR server. Use this parameter only in cases where the IP address is not the main IP address of the Subscriber Manager machine; for example in cluster topologies.

- port—Specifies the Quota RDR server port. The default value is 32145.

- max_connections—Specifies the maximum number of Cisco SCE connections accepted by the server. The maximum value is 200. The default value is 8.

- socket_recv_buffer—Specifies the receiver buffer size which is used to scale up the TCP receive window to the configured buffer size. The default value is 64KB.

- server_socket_backlog—Specifies the requested maximum number of pending connections on the socket. The default value is 0. For example, if the maximum number of allowed connections is set to 200 and the socket backlog is set to 150, after starting the server, the remaining 50 Cisco SCE connections take more time to become operational due to the additional overhead involved in handling the extra connections. If the server_socket_backlog parameter were configured as 200, all Cisco SCE connections would become operational immediately after restarting the server. We recommend that you use the default value or configure the server_socket_backlog parameter based on the value of the maximum_connections parameter for better performance.

- server_socket_timeout—Specifies the server socket timeout for accepting connections. The default value is 0.

- rdr_queue_size—Specifies the maximum number of RDRs stored in the internal quota queue before processing. The default value is 100, 000.

- queue_threshold—Specifies the maximum queue utilization percentage used to decide whether or not to drop the non-priority quota RDRs. The default value is 90. We recommend that you do not set the queue_threshold value to below 70.

Configuring the Quota RDR Server: Example

```
start              =yes
```

```
ip                   =172.21.31.209
port                 =32145
max_Connections      =8
socket_recv_buffer   =1000
server_socket_backlog =0
server_socket_timeout =0
max_connections      =6
rdr_queue_size       =100000
queue_threshold      =90
```

Restrictions for Configuring the Quota RDR Server

- The Cisco Subscriber Manager handles quota RDRs only if the quota RDRs are enabled under Category 4 and not CPA. If you want the Cisco Service Control Subscriber Manager to handle both the CPA and Quota RDR, set the UM-Agent as the quota RDR processor.

- You can specify the RDR formatter destination for Category 4 only as the UM-Agent or Cisco Subscriber Manager.

- We recommend that you configure the max_connections parameter based on the number of Cisco SCEs. For example, you cannot configure the max_connections parameter to one if you have two Cisco SCEs.

- Even if you remove the Cisco SCE from the Cisco Subscriber Manager, the Cisco SCE sends the quota RDRs to the Cisco Subscriber Manager for processing. To avoid this, disable the quota RDR formatter as Cisco Subscriber Manager in the Cisco SCE.

Note   We recommend that you configure the Cisco Service Control Subscriber Manager in pull mode if you move the RDR formatter to the Cisco Service Control Subscriber Manager from the EM-Agent.

Configuring the Cisco Service Control Subscriber Manager

To use the Cisco Service Control Quota Manager within the Cisco Service Control Subscriber Manager, you must configure the Cisco Service Control Subscriber Manager configuration file, p3sm.cfg. This configuration file resides in the *sm-inst-dir*/sm/server/root/config directory (*sm-inst-dir* refers to the Cisco Service Control Subscriber Manager installation directory). The configuration file consists of sections headed by a bracketed section title, for example [Quota Manager].

Configuring the Quota Manager Section

The [Quota Manager] section in the Cisco Service Control Subscriber Manager configuration file contains the following parameters:

- start—Defines whether to start the Quota Manager or not.

  Possible values are yes and no. The default value is no.

- reset_quota_on_profile_switch—Defines whether the Quota Manager should reset quota history cross global profiles.

  Possible values are true and false. The default value is true.

- reset_quota_on_penalty_profile_switch—Defines whether the quota manager should reset quota history across penalty profiles.

Possible values are true and false. The default value is false.

- log_all—Defines whether the Quota Manager should add all messages to the user log.

  Possible values are true and false. The default value is false.

- log_failures—Defines whether the Quota Manager should add messages about failures to the user log.

  Possible values are true and false. The default value is true.

- log_breach_events—Setting the log_breach_events parameter to true logs only events of subscriber bucket breach and new aggregation period starts.

  Possible values are true or false. The default value is false.

- handle_out_of_penalty_on_aggregation_period_end—Determines whether to allow a subscriber to come out of penalty at the end of an aggregation period. The default value is false.

- multiple_sce_support—Determines whether to enable multiple Cisco SCE support.

  Possible values are true or false. The default value is false.

- quota_allocation_based_on—Determines which flavor to choose for multiple Cisco SCE support. The possible values are consumption and provisioned. The default value is consumption.

- handle_multi_bucket_in_grace_period—(Applicable only to multibucket quota profile configurations). Enables accounting of quota notifications that the Quota Manager has received around the last quota provisioning time.

Configuring the Quota Manager—Example

The following is an example of a Cisco Service Control Quota Manager configuration:

```
start=yes
reset_quota_on_profile_switch=true
reset_quota_on_penalty_profile_switch=false
log_failures=true
log_all=false
log_breach_events=false
multiple_sce_support=true
quota_allocation_based_on=consumption
handle_multi_bucket_in_grace_period=false
```

Quota Manager Performance Recommendations

You are recommended to configure Quota RDR server in Cisco Service Control Subscriber Manager to achieve the high TPS. In this approach, quota RDRs are sent directly to the Cisco Service Control Subscriber Manager and converted to quota message and handled in Cisco Service Control Subscriber Manager.

To achieve the required TPS per SCE, you need to configure the following options in QuotaRDRServer section of p3qm.cfg.

```
max_processing_thread=2
socket_recv_buffer=1MB
rdr_queue_size=200k
```

Configuring the Cisco SCA BB Application

For the Cisco SCA BB application to be able to use the Cisco Service Control Quota Manager, the Quota Management parameters in the Service Configuration File (PQB) must be configured correctly. Specifically, the following are required:

- Package configurations
  - Set the quota management to external.
  - When configuring buckets, set the appropriate bucket type. Available types are Volume (Layer 3 kilobytes) or Number of Sessions.
  - In the usage limit definitions for the appropriate service rules, select the appropriate buckets. Service traffic consumes quota from the selected buckets.
  - Use the breach handling action of the rule to configure the level of service to assign to this traffic while the bucket is depleted.
- Raw Data Records
  - Set which quota RDRs should be generated and the rate for the remaining quota RDRs.

This section contains information about:

- Setting the Quota RDRs, page 3-23
- Enabling the RDR Formatter to Issue Quota-Related Indications, page 3-24
- Configuring Cisco SCE for Quota Management Provisioning, page 3-24

Note To enable the application to issue quota-related indications, the QM indications should be enabled in the Cisco Service Control Application for Broadband GUI. See the *Cisco Service Control Application for Broadband User Guide* for configuration description.

For information on why and when to set the quota management mode and quota buckets, see the *Cisco Service Control Application for Broadband User Guide*.

To configure the Cisco Service Control Quota Manager using the Cisco SCA BB, complete the following steps:

Step 1 Add a quota profile. See the "Adding a Quota Profile" section on page 3-11.

Step 2 Configure bucket settings for the quota profile. See the "Configuring the Bucket Settings for the Quota Profile" section on page 3-12.

Step 3 Add services to a bucket. See the "Adding Services to a Bucket" section on page 3-13.

Step 4 Add packages, and then add quota profiles to the package. See the "Adding a Package and Adding Quota Profiles to the Package" section on page 3-15.

Step 5 Add rules to the packages and configure the general rules. See the "Adding Rules to a Package and Setting General Rules" section on page 3-18.

Step 6 Configure the control rules. See the "Configuring Control Rules" section on page 3-20.

Step 7 Configure the breach handling rules. See the "Configuring Breach Handling Rules" section on page 3-21.

Step 8 View the usage limits. See the "Viewing the Usage Limit" section on page 3-22

Adding a Quota Profile

**Step 1** From the Policies tab in the left pane, choose **Configuration > Policies > Quota Settings** to open the Quota Profile Editor.

Step 2 Click the **SCE Subscriber API** radio button. The Subscriber API enables the external applications (policy servers) to connect directly to the Cisco SCE for subscriber provisioning. For more information, see *Cisco Service Control SCE Subscriber API Programmer Guide.*

Step 3 Click the **Quota Profile Edit** tab. (By default, the Quota Profile Edit tab is selected).

Step 4 Click **Add**.

Step 5 In the Add Quota Profile dialog box, from the Type drop-down list choose **Subscriber Sce Api**.

Step 6 In the name field, enter a unique name for the profile, for example, My Quota Profile.

Step 7 Click **Finish**.

Configuring the Bucket Settings for the Quota Profile

Step 1 From the Policies tab in the left pane, choose **Configuration > Policies > Quota Settings** to open the Quota Profile Editor.

Step 2 Click the **Quota Profile Edit** tab.

Step 3 Select the quota profile for which you want to configure the bucket settings.
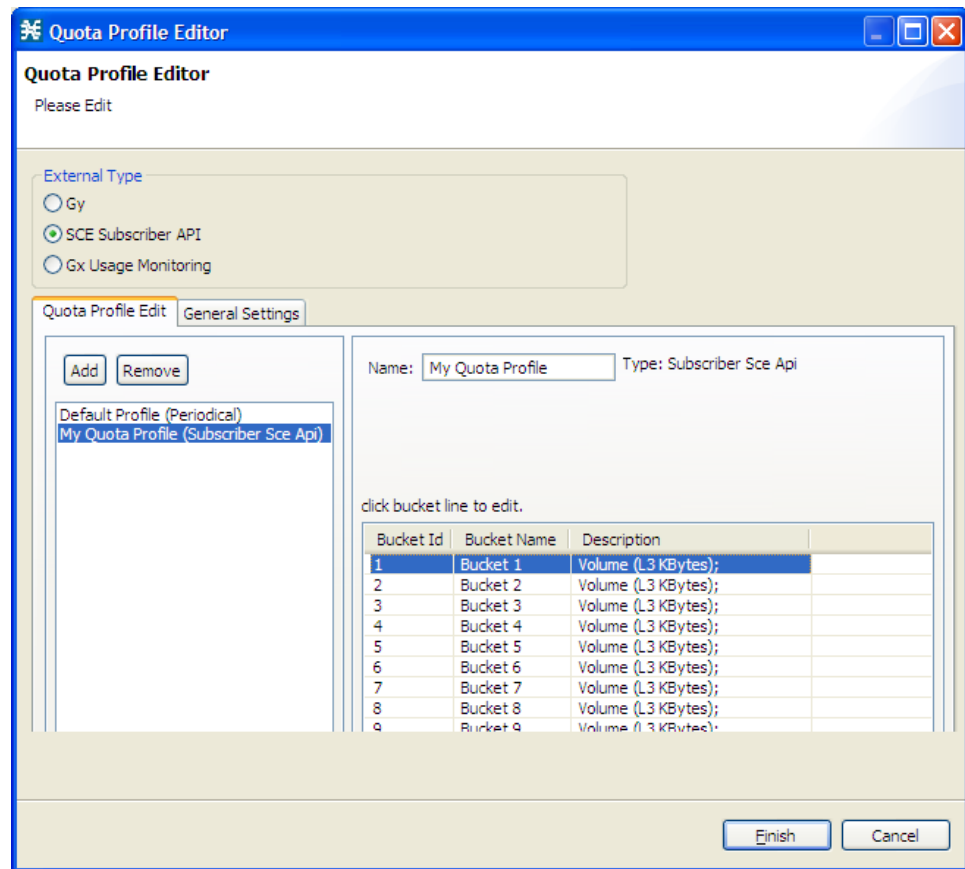
Step 4 Click the bucket line of the bucket that you want to edit.

Step 5 In the Quota Bucket Editor, click the **Bucket** tab.

Step 6 Select the type of bucket from the Type drop-down list.

Step 7 Click **Finish**.

Adding Services to a Bucket

A service may be any of the following types:

- Upload
- Download
- Sessions

Step 1 From the Policies tab in the left pane, choose **Configuration > Policies > Quota Settings** to open the Quota Profile Editor.

Step 2 Click the **Quota Profile Edit** tab.

Step 3 Select the Quota Profile you want to edit.

Step 4 Click the bucket line of the bucket that you want to edit.

Step 5 In the Quota Bucket Editor window, click the **Service** tab.

Step 6 Move the required services from Non attached services pane to the Attached services pane by selecting the services and clicking **>>**. You may choose any of the services from any of the tabs (Download, Upload, Sessions) in the Non attached services.
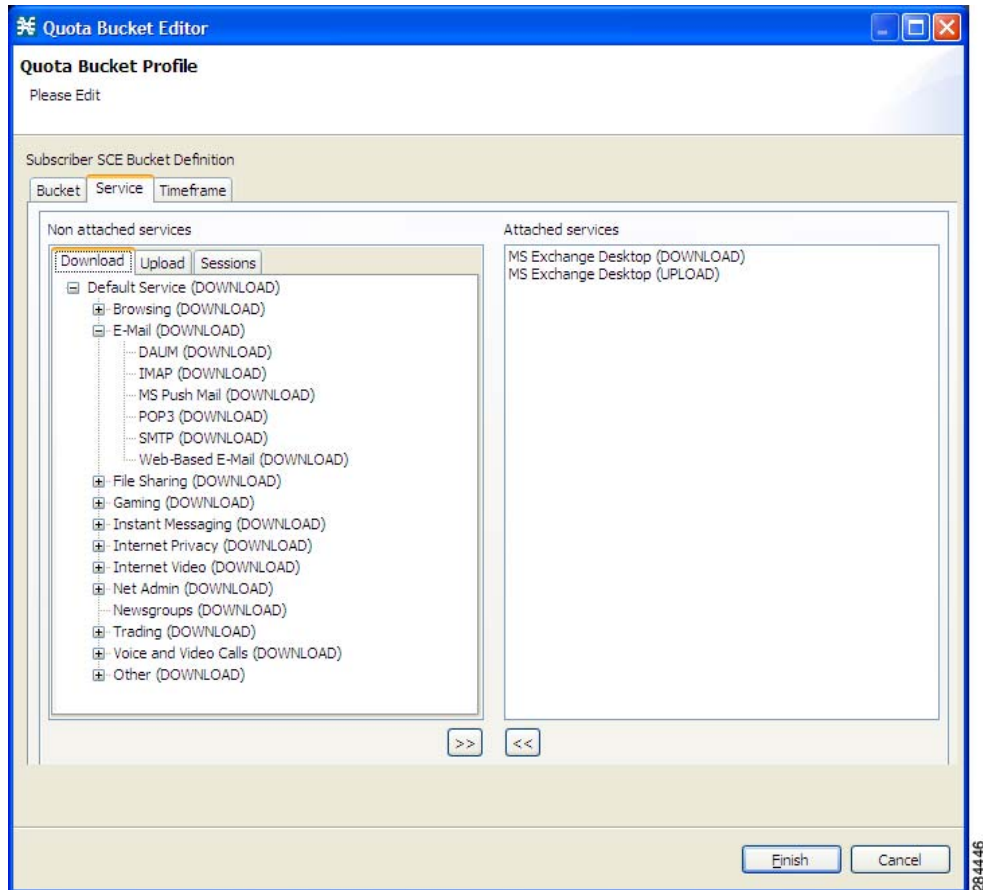
Step 7 Click **Finish**.

The bucket description for the selected quota profile is updated with the details.
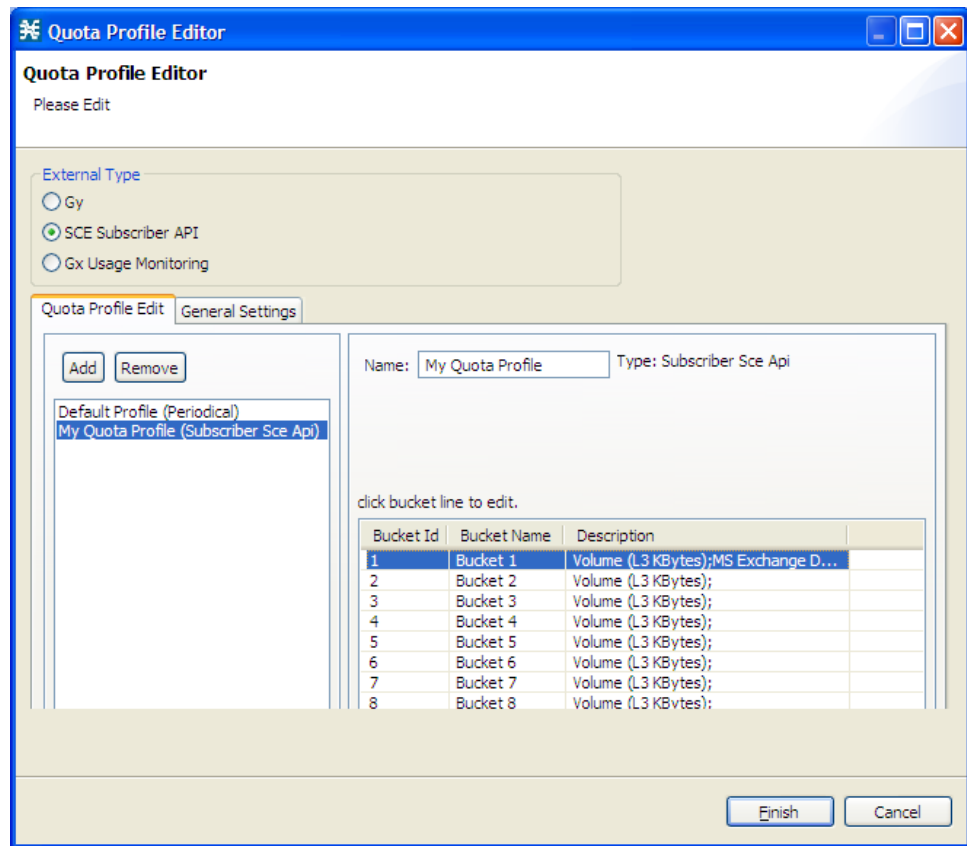
Step 8 Click **Finish**.

Adding a Package and Adding Quota Profiles to the Package

Step 1 In the Service Configuration Editor, Click the Policies tab.

Step 2 Select the Subscriber Policies.

Step 3 Click the Add Package icon or right-click the policy and select Add Package.

Step 4 (Optional) Click the **General** Tab.

Step 5 (Optional) Modify the package name, and enter a description for the package.
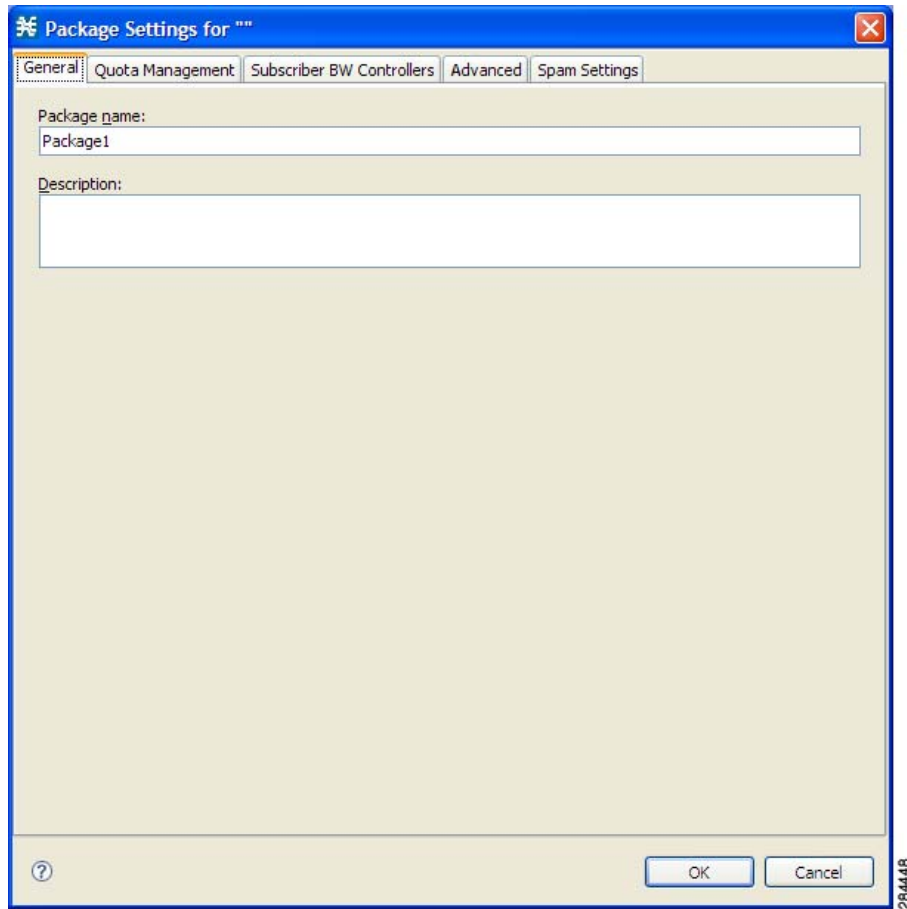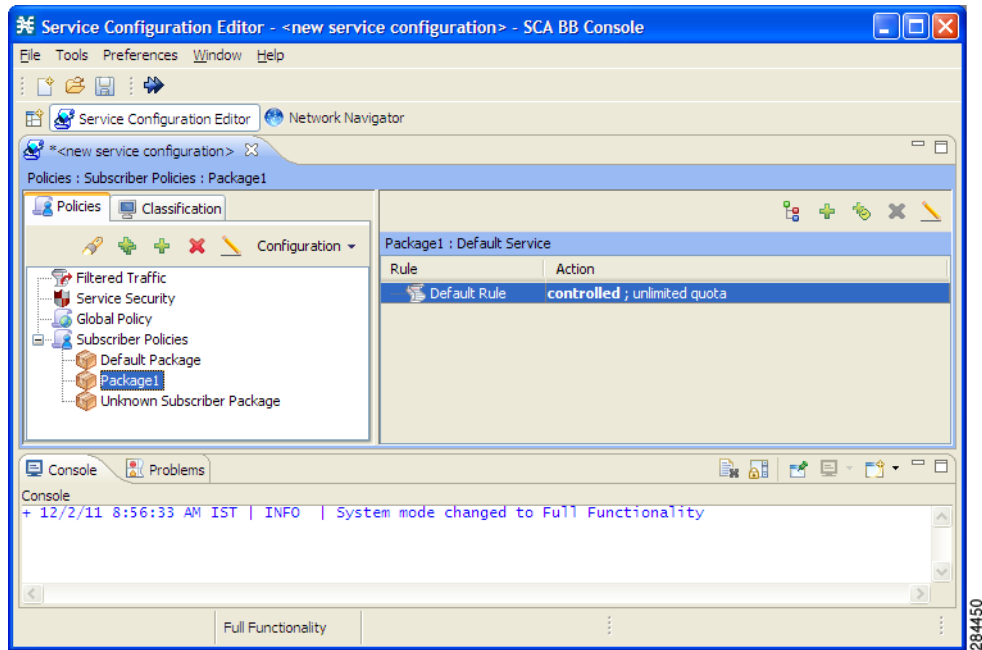
Step 6 Click the **Quota Management** tab.

Step 7 From the Select Quota Profile drop-down list, select the quota profile to add the package.
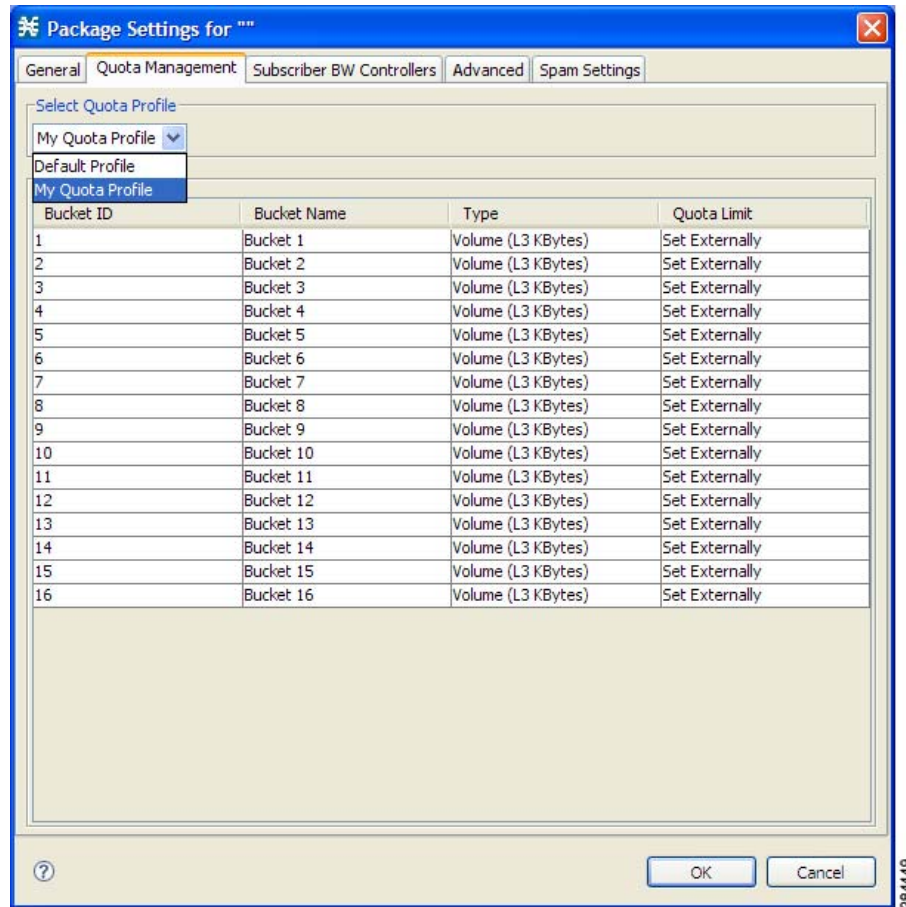
Step 8 Click **OK**.

Adding Rules to a Package and Setting General Rules

Step 1 In the Service Configuration Editor window, click the Policies tab.

Step 2 Select the package from the list of Subscriber Policies.

Step 3 Click the Add Rules icon or right-click the Default Rule and select Add Rule.

Step 4 Click the **General** tab.

Step 5 From the Service drop-down list, select the service for which you need to set the rule.
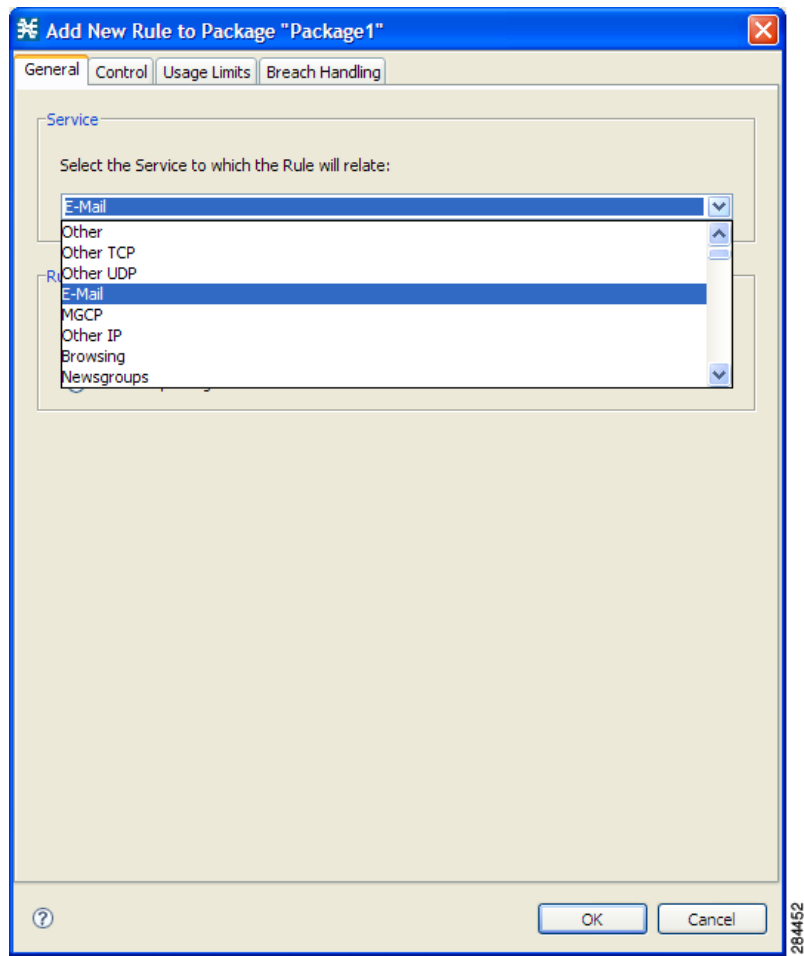
Step 6   In the Rule State area, define the state of the rule

Step 7   Click **OK**.

Configuring Control Rules

Step 1   In the Service Configuration Editor window, click the **Policies** tab.

Step 2   Select the package from the list of Subscriber Policies.

Step 3   Click the Add Rules icon or right-click the Default Rule and select **Add Rule**.

Step 4   Click the **Control** tab.

**Step 5**   Click any of the following controls:

- Block the flow—This blocks the flow when a subscriber initiates a download, upload, or a session for the linked bucket.

- Control the flow's characteristics.

Step 6   (Optional) Select a redirect profile for the service.

Step 7   (Optional) Select the server group to which the traffic should be mirrored. Traffic mirroring is not available if you block the flow.

**Step 8**   Click **OK**.

Configuring Breach Handling Rules

Step 1   In the Service Configuration Editor window, click the **Policies** tab.

Step 2   Select the package from the list of Subscriber Policies.

Step 3   Click the **Add Rules** icon or right-click the **Default Rule** and select **Add Rule**.

Step 4   Click the **Breach Handling** tab.

Step 5   Set the rules to be applied when a subscriber's usage exceeds the quota.
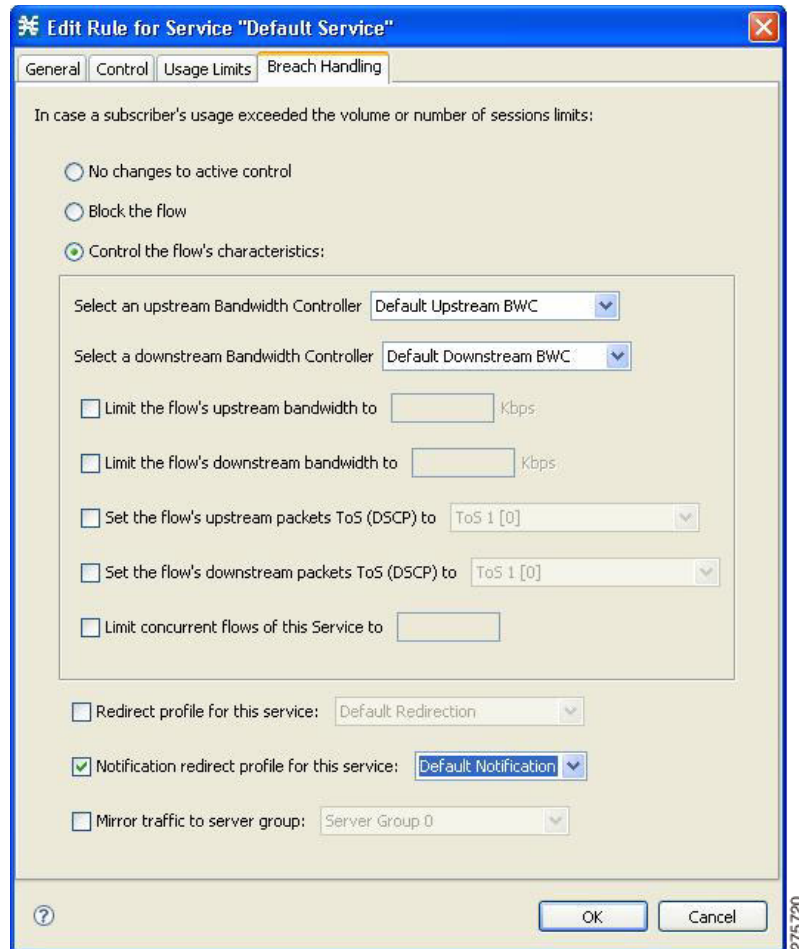
Step 6   Click **OK**.

Viewing the Usage Limit

Step 1   In the Service Configuration Editor window, click the **Policies** tab.

Step 2   Select the package from the list of Subscriber Policies.

Step 3   Click the **Add Rules** icon or right-click the **Default Rule** and select **Add Rule**.

Step 4   Click the **Usage Limits** tab.
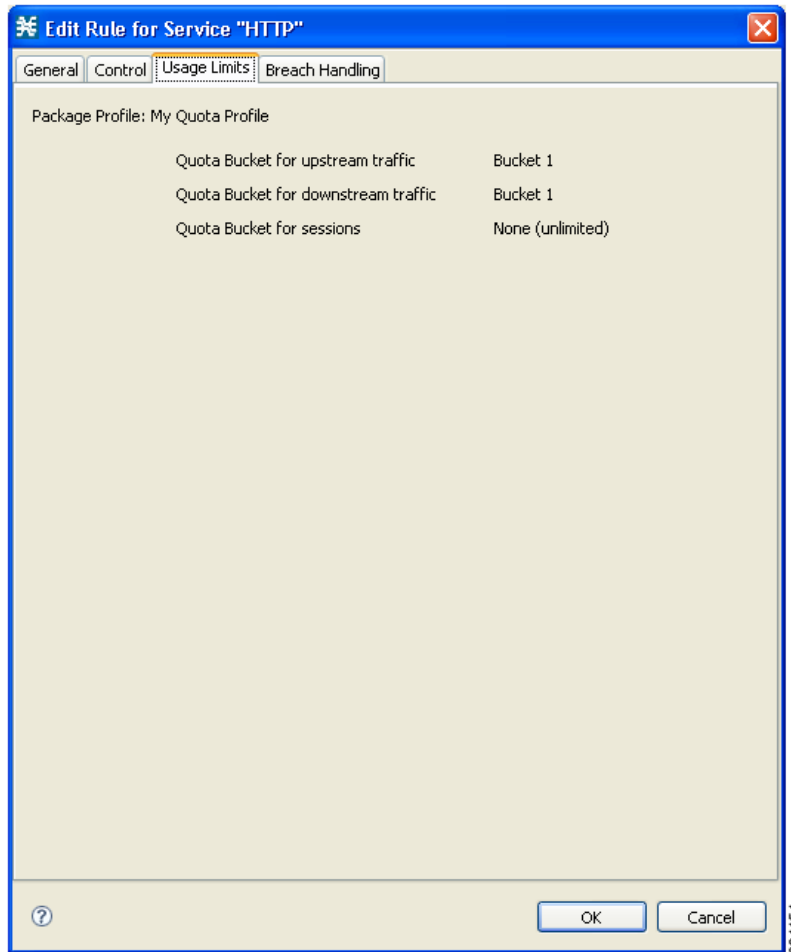
Click **OK**.

Setting the Quota RDRs

This section describes how to set the quota RDRs. For information on why and when to set the quota RDRs, see the *Cisco Service Control Application for Broadband User Guide*.

Step 1　In the Service Configuration Editor, click the **Classification** tab.

Step 2　Choose **Configuration > Classification > RDR Settings**.

Step 3　Click the **Quota RDRs** tab.

Step 4　Select the quota RDRs to be generated.

　　a.　If you want to generate an RDR when the quota is breached, set the Quota Breach RDRs. We recommend that you set this.

　　b.　If you want to keep the Quota Manager updated with the remaining quota, set the Remaining Quota RDRs.

　　　It is possible to set the frequency with which these RDRs are generated and the quantity generated per second.

> **Note** Generating higher number of RDRs results in increased accuracy of the remaining subscriber quota. However, a performance penalty exists if you set to generate higher number of RDRs.

    c. If you want to generate an RDR when subscriber quota drops below the defined threshold, set the Quota Threshold RDRs.

    d. Quota State Restore RDRs must be generated. These RDRs are generated by the SCE in response to a subscriber login event.

Step 5 Click **OK**.

Enabling the RDR Formatter to Issue Quota-Related Indications

To enable the RDR formatter to issue quota-related indications, Configure the RDR formatter destination.

```
#> RDR-formatter destination 127.0.0.1 port 33001 category number 4 priority 100
```

By default, Quota RDRs tags are mapped to category 4. If another category is required, use the following CLI command:

```
#> RDR-formatter rdr-mapping add tag-ID tag number category-number number
```

> **Note** For Quota RDR tag IDs, see the *Cisco Service Control Application for Broadband User Guide*.

Configuring Cisco SCE for Quota Management Provisioning

To configure Cisco SCE to provision quota management, follow these steps:

Step 1 Service the RDR formatter:

```
SCE10000(config)#> service RDR-formatter
```

Step 2 Enable, through a PQB file or CLU, the Quota RDRs in the service configuration file to get quota indications:

```
SCE10000(config if)#> tunable GT_REP_QP_RemainQuota_Enable value true
SCE10000(config if)#> tunable GT_REP_QP_QuotaBreach_Enable value true
SCE10000(config if)#> tunable GT_REP_QP_ThresholdBreach_Enable value true
SCE10000(config if)#> tunable GT_REP_QP_RemainQuota_MaxFrequency value 1000
SCE10000(config if)#> tunable GT_REP_QP_RemainQuota_Rate value 60
```

Step 3 Set the quota management mode to External in Cisco SCA BB console.

While switching a package, Cisco SCE does not generate a Session Creation RDR (SCR) by default. To generate an SCR while switching a package, set the value of the GT_QSR_forAnyExternalPackageSwitch tunable to TRUE. For example:

```
SCE10000(config if)#> tunable GT_QSR_forAnyExternalPackageSwitch value true
```

Provisioning Multiple Quota Buckets with Penalty Profile

Ensure the following to successfully configure the Cisco SCE for multiple quota buckets with penalty profile:

- The number of buckets and the number of penalty_profile in a quota profile must be same.

- The profiles in the penalty profile list must be separated using comma.

- The post_penalty parameter should be defined as done in any of the following examples:

    - post_penalty.[10|20]=QP11

    - post_penalty.[90]=QP11

    - post_penalty.1000=QP11

    - post_penalty.1000|2000=QP11

- If you are configuring a threshold based on the percentage of threshold usage, define the postpenalty threshold values within square brackets ([ ]). If your configuration is based on numerical values, you need not use square brackets.

- If more than one postpenalty threshold is defined, the threshold values must be separated by a pipe symbol (|) to denote an OR operation.

- You must configure at least one threshold value in a postpenalty parameter.

- You can configure more than one value for postpenalty threshold. However, the number of postpenalty threshold values in a postpenalty parameter must be equal to the number of buckets.

- Do not use the profiles in multiple penalty chains, if the number of buckets in these penalty chains varies.

- All profiles associated with a penalty profile should be added sequentially in the Cisco Service Control Quota Manager configuration file—first the START profile, then all MIDDLE profiles, and then the LAST profile.

Provisioning Multiple Quota Buckets with Penalty Profile—Example

In this example, Bucket 1 is Downstream, and Bucket 2 is Upstream. Quota Profile QP11 is the base profile, QP22 is the downstream subscriber penalty profile, and QP33 is an upstream subscriber penalty profile.

QP22 and QP33 are the penalty profiles for Bucket 1 and Bucket 2 respectively for QP11. If the buckets breach the quota, the subscriber is switched to the respective penalty profiles. Assume that Bucket 1 is breached and the subscriber is moved to quota profile QP22. The subscriber is moved to QP11 if the quota consumed is less than 10% of Bucket 1 or less than 20% of the Bucket 2, The subscriber is moved to QP22 if the quota consumed is less than 90% of Bucket 1 or less than 90% of the Bucket 2.

```
[QuotaProfile.QP11]
packages=1
bucket_sizes=10086,20016
dosage_sizes=1000,2000
aggregation_period=60 minutes
penalty_period=none
penalty_profile=QP22,QP33
slice_period=10


[QuotaProfile.QP22]
```

```
packages=2
bucket_sizes=5084,20016
dosage_sizes=1000,2000
aggregation_period=40 minutes
penalty_period=30
penalty_profile=QP44,QP55
post_penalty.[10|20]=QP11
post_penalty.[90]=QP22
slice_period=10

[QuotaProfile.QP33]
packages=3
bucket_sizes=10083,10014
dosage_sizes=1000,2000
aggregation_period=30 minutes
penalty_period=30
penalty_profile=QP66,QP77
post_penalty.[10|20]=QP11
post_penalty.[90]=QP33
slice_period=10

[QuotaProfile.QP44]
packages=4
bucket_sizes=5082,20016
dosage_sizes=1000,2000
aggregation_period=30 minutes
penalty_period=30
penalty_profile=QP44,QP55
post_penalty.[10|20]=QP11
post_penalty.[90]=QP22
slice_period=10

[QuotaProfile.QP55]
packages=5
bucket_sizes=10086,10014
dosage_sizes=1000,2000
aggregation_period=30 minutes
penalty_period=30
penalty_profile=QP66,QP77
post_penalty.[10|20]=QP11
post_penalty.[90]=QP33
slice_period=10

[QuotaProfile.QP66]
packages=6
bucket_sizes=5082,20016
dosage_sizes=1000,2000
aggregation_period=60 minutes
penalty_period=20
penalty_profile=QP44,QP55
post_penalty.[10|40]=QP11
post_penalty.[90]=QP22
slice_period=10

[QuotaProfile.QP77]
packages=7
bucket_sizes=5082,20016
dosage_sizes=1000,2000
aggregation_period=60 minutes
penalty_period=60
penalty_profile=none
post_penalty.[10|40]=QP11
post_penalty.[90]=QP22
slice_period=10
```

Saving the Cisco Service Control Quota Manager and VLM Logs Separately

On Cisco SCE releases prior to 4.1.0, the Cisco Service Control Subscriber Manager saves the Cisco Service Control Quota Manager, VLM, and LEGs log messages in the umlog file. Effective with Cisco SCE Release 4.1.0, you can configure the Cisco Service Control Subscriber Manager to save the logs separately.

These log messages are saved in cablelog and qmlog files. You can enable this feature by configuring the log4j.ini file which is located at pcubehome/sm/server/root/. The default file size is 6 MB.

Sample Configuration

The following is sample configuration of the log4j.ini file.

```
# CableFileAppender - used to log messages in the cablelog file.
log4j.appender.CableFileAppender=org.apache.log4j.RollingFileAppender
log4j.appender.CableFileAppender.layout=org.apache.log4j.PatternLayout
log4j.appender.CableFileAppender.layout.ConversionPattern=
%d{"dd-MMM yyyy", "HH:mm:ss.SSS zzz"},"[%t]",%-5p,"%c","%m"\n

log4j.appender.CableFileAppender.File=${com.pcube.filemanager.defaultPath}cablelog
log4j.appender.CableFileAppender.ImmediateFlush=true
log4j.appender.CableFileAppender.MaxFileSize=6000000
log4j.appender.CableFileAppender.MaxBackupIndex=5

# QMFileAppender - used to log messages in the qmlog file.
log4j.appender.QMFileAppender=org.apache.log4j.RollingFileAppender
log4j.appender.QMFileAppender.layout=org.apache.log4j.PatternLayout
log4j.appender.QMFileAppender.layout.ConversionPattern=
%d{"dd-MMM yyyy", "HH:mm:ss.SSS zzz"},"[%t]",%-5p,"%c","%m"\n

log4j.appender.QMFileAppender.File=${com.pcube.filemanager.defaultPath}qmlog
log4j.appender.QMFileAppender.ImmediateFlush=true
log4j.appender.QMFileAppender.MaxFileSize=6000000
log4j.appender.QMFileAppender.MaxBackupIndex=5


#Below package info,warning and debug messages are excluded from umlog
log4j.additivity.com.scms.vlink=false
log4j.additivity.com.scms.qm=false

#Below package info,warning and debug messages are included from cablelog
log4j.logger.com.scms.vlink=DEBUG, CableFileAppender, Chainsaw
log4j.logger.com.scms.vlink=INFO, CableFileAppender
log4j.logger.com.scms.vlink=INFO, CableFileAppender, stdout
#Below package info,warning and debug messages are included from qmlog
log4j.logger.com.scms.qm=DEBUG, QMFileAppender, Chainsaw
log4j.logger.com.scms.qm=INFO, QMFileAppender
log4j.logger.com.scms.qm=INFO, QMFileAppender, stdout
```