Cisco Quota Manager Solution Guide

Release 3.1
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About This Guide

The *Cisco Quota Manager Solution Guide* is a guide to enable integration engineers and ISPs to manage subscriber quota.

This document is for ISPs and system integrators who will be integrating the Cisco Service Control Application for Broadband solution (referred to as Cisco SCA BB) with external components belonging to the customer ecosystem in order to provide a complete quota management solution. The document assumes that the reader is familiar with the Cisco SCA BB solution.

This introduction provides information about the following topics:

- Audience
- Document Revision History
- Organization
- Document Conventions
- Related Documentation
- Obtaining Documentation, Obtaining Support, and Security Guidelines

Audience

This guide is for the networking or computer technician responsible for configuring the Subscriber Manager. It is also intended for the operator who manages the SCE platforms.

Document Revision History

Cisco Service Control Release	Part Number	Publication Date
Release 3.1.0	OL-12489-02	May, 2007

Description of Changes

- Support for subscribers purchasing additional quota within an aggregation period. See Setting a Subscriber's Quota and Adding to a Subscriber's Quota.

Cisco Service Control Release	Part Number	Publication Date
Release 3.0.5	OL-12489-01	November, 2006

Description of Changes

- This is the first version of this document.

Organization

The major sections of this guide are as follows:

Table 1

Chapter	Title	Description
Chapter 1	Overview	Describes the Quota Manager solution and its functionality.
Chapter 2	Quota Manager Scenarios	Describes some common scenarios that occur when using the Quota Manager.
Chapter 3	Configuring the Quota Manager	Describes the configuration instructions to configure the Quota Manager.
Chapter 4	Using the Quota Manager CLU	Describes the Command-Line Utilities to retrieve information and statistics from and about the Quota Manager.

Document Conventions

This guide uses the following conventions:

- **Bold** is used for commands, keywords, and buttons.
- *Italics* are used for command input for which you supply values.
- `Screen` font is used for examples of information that are displayed on the screen.
- **`Bold screen`** font is used for examples of information that you enter.
- Vertical bars (|) indicate separate alternative, mutually exclusive elements.
- Square brackets ([ ]) indicate optional elements.
- Braces ({ }) indicate a required choice.
- Braces within square brackets ([{}]) indicate a required choice within an optional element.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the guide.

Timesaver Means the *described action saves time*. You can save time by performing the action described in the paragraph.

⚠️

Caution   Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

⚡

Warning   Means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents. To see translated versions of warnings, refer to the *Regulatory Compliance and Safety Information* document that accompanied the device.

Related Documentation

Use this *Cisco Quota Manager Solution Guide* in conjunction with the following Cisco documentation:

- *Cisco SCMS Subscriber Manager User Guide*
- *Cisco SCMS SCE Subscriber API Programmer Guide*
- *Cisco Service Control Application for Broadband User Guide*
- *Cisco SCA BB Service Configuration API Programmer Guide*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Obtaining Documentation, Obtaining Support, and Security Guidelines

Cisco Quota Manager Solution Guide

C H A P T E R 1

Overview

This module provides an overview of the Quota Manager.

Information About the Quota Manager

In versions of the SCMS Subscriber Manager prior to version 3.0.x, there existed functionality to maintain subscriber quota levels across subscriber sessions. This functionality was removed in version 3.0, but has now been enhanced and reinstated.

The Quota Manager (QM) is now available as a component of the Subscriber Manager, which enables Service Control solution providers to manage, with a high degree of flexibility, subscriber quota.

Functionality

The Quota Manager controls SCA BB quota functionality, and acts as an entry-level quota policy repository. The Quota Manager is an event driven solution leveraging the functionality of the SCE Subscriber API. The Quota Manager provides the following functionality:

- Subscriber quota is preserved across subscriber sessions
- Subscribers can be assigned time-based quota that is replenished in fixed intervals, called aggregation periods
- Subscribers can be moved between packages at any time, whether they are logged in or not
- Subscribers can purchase additional quota within an aggregation period
- Periodic subscriber quota does not accumulate across aggregation periods
- Aggregation periods and amounts can be set on a per package basis
- Quota allocation at the beginning of an aggregation period can be spread over time for different subscribers to avoid the buildup of traffic bursts at the start of the aggregation period
- Subscriber quota is preserved across Quota Manager upgrade

- Supports all SCE topologies (1+1 and MGSCP)
- Supports high availability of the Quota Manager server (utilizing a Veritas Cluster Server)

System Overview

The Quota Manager module runs as a component on the SM. All of the logic to manage and maintain quotas runs on the SM server; therefore, you should configure the Quota Manager on the SM or load the configuration onto the SM. In a cluster setup, you must load the configuration onto each SM in the cluster. Subscriber quotas are stored in the SM DB.

The Quota Manager uses the SCE Subscriber API to provision quota to subscribers upon request using the existing external quota functionality of the SCE.

Note   Per package quota configuration must be carried out on the SM adding complexity to the integration or operation. Quota management also requires more management messages on the network.

Network Topology

The following figure shows the network topology of a system employing quota management. The Quota Manager can serve more than one SCE. At any point in time, a single subscriber must be handled by a single SCE.

Figure 1-1   Quota Manager Network Topology
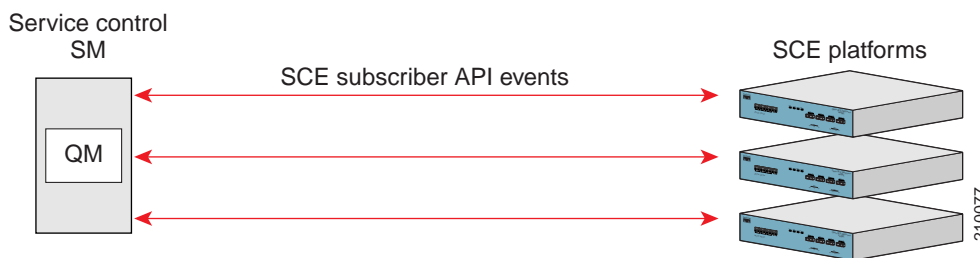
Quota Indications

The Quota Manager is an event-driven component. All quota logic is performed as a response to quota indications that the SCE initiates. Therefore, the quota state is up-to-date in accordance with the last quota indication received.

The Quota Manager handles the following quota indications:

- Quota Breach—The SCE generates this indication when a subscriber uses the entire available quota in the SCE. The quota manager responds to this indication by providing more quota for the subscriber if the subscriber quota allocation is not depleted for the current aggregation period.
- Remaining Quota—The SCE periodically generates this indication to keep the Quota Manager updated with the quota remaining in the SCE. The SCE also generates this indication upon subscriber logout and package switch. In most cases, the Quota Manager does not respond to this

indication, but does write the quota value to the database to be stored until the subscriber next logs in. If the reported quota is below zero, the Quota Manager responds by providing more quota for the subscriber if the subscriber quota allocation is not depleted for the current aggregation period.

- Quota Below Threshold—The SCE generates this indication when the subscriber quota in the SCE drops below a predefined level. The Quota Manager responds to this indication by providing more quota for the subscriber if the subscriber quota allocation is not depleted for the current aggregation period.

- Quota State Restore—The SCE generates this indication in response to a subscriber login event. The Quota Manager responds to this indication by updating the subscriber quota in the SCE.

Note   Quota calculation uses the system date and time of the Quota Manager machine to calculate aggregation periods. If during Quota Manager operation the system date and time is changed, it is recommended to delete all quota information from the SM database to recalculate all aggregation periods according to the new date and time. This operation will also cause a quota replenish for all subscribers.

Note   To remove quota information from the SM database, run the following CLU:

```
p3subsdb --clear-all-states
```

Note   To support accurate calculation of quota consumption, the Quota Manager stores the last SCE IP that consumed subscriber quota. If the IP address of the SCE changes during the Quota Manager operation, a new dosage will be applied to all subscribers in that SCE. Any quota consumed by the subscriber since the last quota indication before the change of IP address will not be accounted for the subscriber.

Quota Provisioning

The Quota Manager provisions quota to the SCE as a response to the following quota indications: Quota State Restore, Quota Below Threshold, and Quota Breach. Quota provisioning occurs only if quota is still available for the subscriber.

The Quota Manager performs the provisioning by adding quota to the SCE so that after the provisioning operation, the available quota in the SCE will equal a configurable dosage size.

For example, suppose that the following configuration exists for bucket 1:

- Bucket size is 100 MB
- Dosage size is 10 MB
- Threshold size is 1 MB

The following quota provisioning will take place

- When the subscriber logs in for the first time, the SCE initiates a Quota State Restore indication for this subscriber. This indication triggers the following actions:
  - 100 MB of quota will be added to the Quota Manager database for the first aggregation period
  - The Quota Manager provisions only 10 MB of quota to the SCE, as configured by the quota dosage value

- After the subscriber consumes 9 MB of quota, the quota threshold (1 MB) is reached and the SCE initiates a Quota Below Threshold indication for this subscriber. This indication triggers the following actions:

    - The Quota Manager provisions a further 9 MB of quota to the SCE. After the provisioning operation, the remaining quota in the SCE equals the dosage size (10 MB).

    - At the same time, the Quota Manager will update its database to indicate that 9 MB of quota was consumed by the subscriber. After the provisioning operation, the remaining quota in the Quota Manager is 91 MB (i.e. 100 MB - 9 MB).

Quota provisioning is split into dosages to ensure that quota consumption is accounted accordingly in the Quota Manager database. This ensures that in cases of failures the amount of quota used, but not accounted for, by a subscriber is limited by the quota dosage size.

C H A P T E R 2

Quota Manager Scenarios

This module describes a number of quota manager scenarios.

Information About Quota Manager Scenarios

This module describes a number of scenarios in order to better understand how the Quota Manager works and to understand the messages between the SM and the SCE.

- Quota Preservation across Subscriber Sessions, page 2-1
- Aggregation Period Changeover, page 2-3
- Quota Breach, page 2-5
- Quota Accuracy, page 2-7

Quota Preservation across Subscriber Sessions

This section describes the means by which subscriber quota is preserved across sessions. The following figure shows this scenario.

Figure 2-1   *Quota Preservation across Subscriber Sessions*
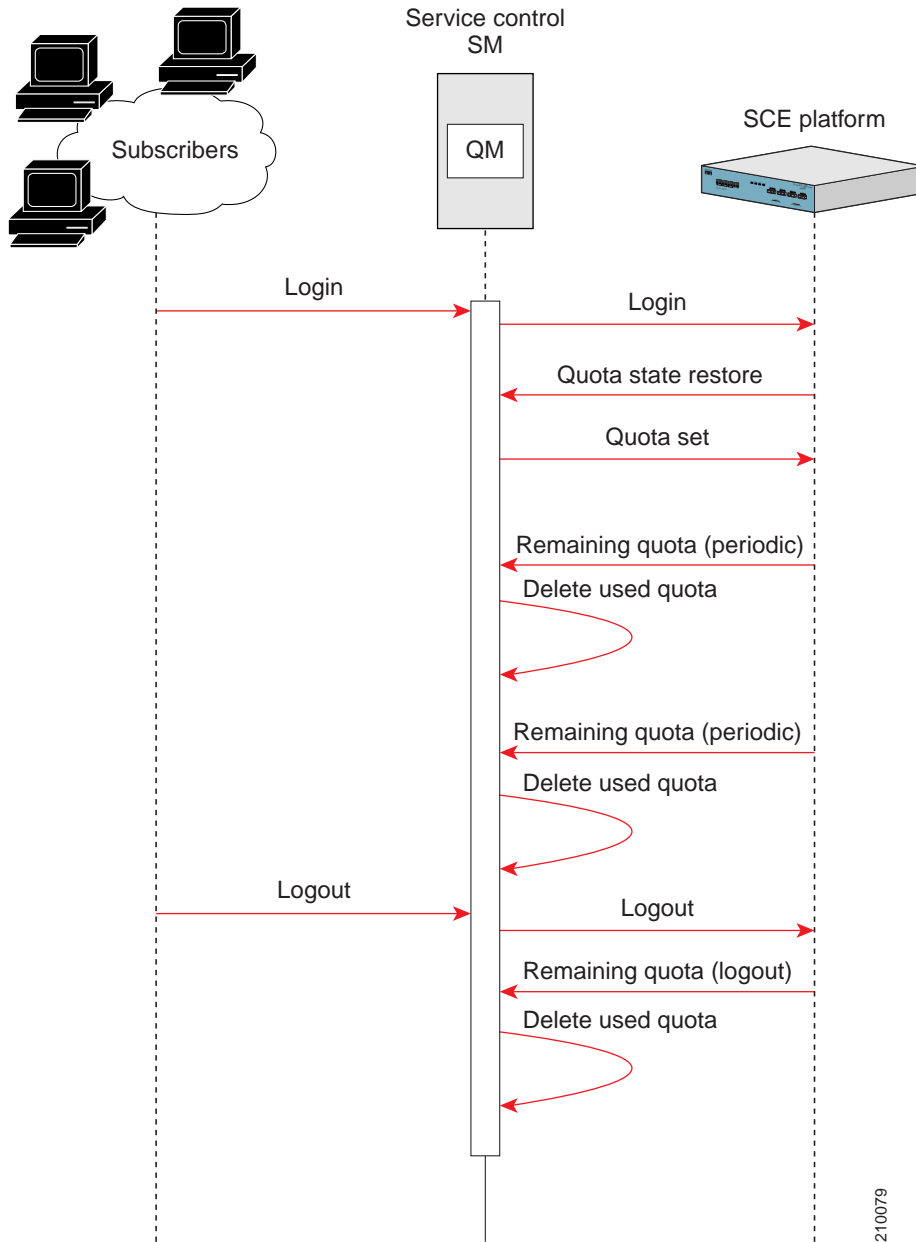
In this scenario, the subscriber first logs into the SM. The SM then performs a logon operation to the SCE, which responds with a Quota State Restore indication. This indication is a request by the SCE to the SM to find out how much quota the subscriber has remaining. The SM queries the database and then responds to the SCE with a Quota Set operation. This sets the amount of quota that is allocated to the subscriber based on the subscriber package and the associated quota profile.

During the subscriber session and while the subscriber is consuming quota, the SCE sends Remaining Quota indications. These are periodic and the frequency at which they are sent is defined when configuring the PQB with the SCA BB Console. As the SM receives each Remaining Quota indication, the Quota Manager removes the required amount of quota from the subscriber buckets.

> **Note**   A higher rate of Remaining Quota indications will result in a higher accuracy for the subscriber quota value. However, it will also increase the number of management messages on the network.

When the subscriber session is finished, the SM performs a logout operation on the SCE, which responds with a Remaining Quota indication. The SM will use the value contained in the indication to delete the quota consumed by the subscriber. The quota value is then written to the database to be stored until the subscriber next logs in.

> **Note**   The quota is subtracted from the subscriber quota account only after the quota is consumed, not when it is provisioned. This ensures that in cases of SCE failover, the quota inaccuracy is calculated in favor of the subscriber.

Aggregation Period Changeover

This section describes the actions taken for each subscriber when a new aggregation period begins. The following figure shows this scenario.

Figure 2-2   Aggregation Period Changeover
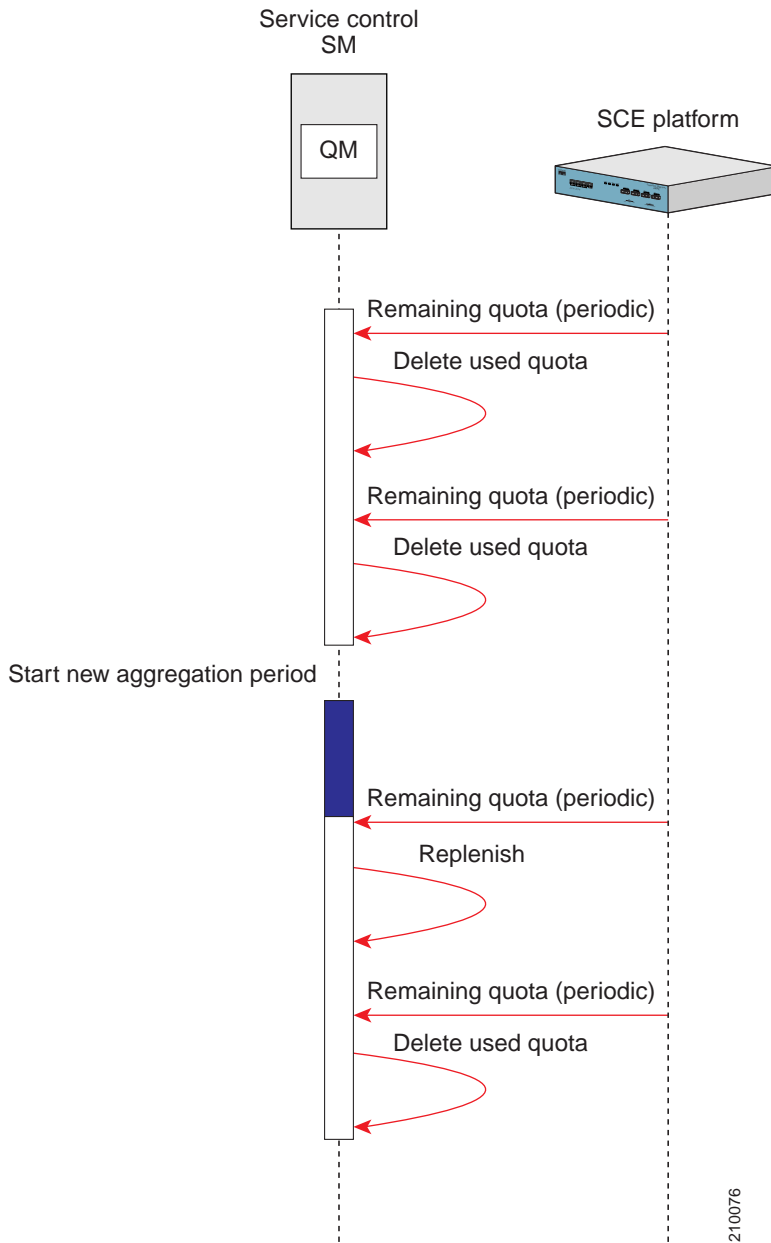
This scenario assumes that the subscriber is already logged in and consuming quota. The top half of the figure shows the SCE generating the Remaining Quota indications and the SM removing the used quota from the subscriber buckets. According to the package and the associated quota profile, at some point, a new aggregation period will start. At a point in time after the start of the new aggregation period, the SCE will send a Remaining Quota indication. When the SM receives this indication, it will replenish the subscriber buckets with the quota amounts defined by the quota profile.

Note   Due to the configuration of the SCE, the first Remaining Quota indication may not occur immediately when the new aggregation period begins. This period of time is highlighted in blue in the above figure. The quota consumed in this time period is consumed from the quota allocated to the previous aggregation period. The inaccuracy of the quota value is less than or equal to the quota dosage and is dependent on the rate of the remaining quota indications. This is a limitation of the application.

Note   If the rate at which Remaining Quota indications are sent is high, the subscriber quota will be replenished at a time in close proximity to the new aggregation period start time. However, this will increase the number of management messages on the network.

Quota Breach

This section describes the actions taken in the event that a subscriber completely depletes his quota. The following figure shows this scenario.

Figure 2-3   *Quota Breach*
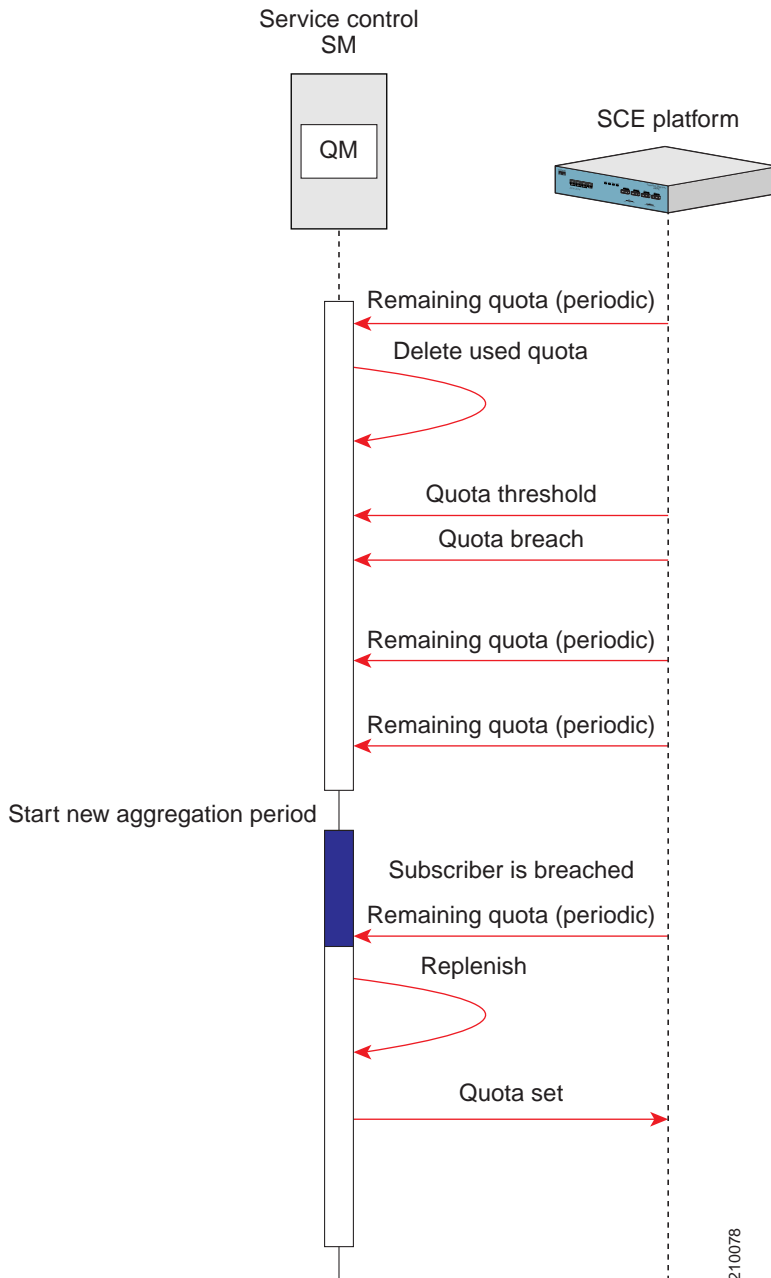
In this scenario, the subscriber is consuming data from the quota buckets and the SCE is generating Remaining Quota indications. When the quota reaches a configurable threshold value, the SCE sends a Quota Threshold indication. In cases where the subscriber can be granted more quota, a quota set operation will be performed. In this case, there is no more quota available for the subscriber. The subscriber continues to consume quota until the quota buckets are empty at which point the SCE will send a Quota Breach indication. At the same time, the post-breach action, which was configured in the SCA BB Console, will be applied for the subscriber.

Once a new aggregation period starts, the subscriber is eligible for more quota. However, quota will be replenished only after the Quota Manager receives the Remaining Quota indication. Once the quota is replenished, a quota set operation is performed and the subscriber can now continue consuming quota.

> **Note**   Due to the configuration of the SCE, the first Remaining Quota indication may not occur immediately when the new aggregation period begins. This period of time is highlighted in blue in the above figure. Because the subscriber is breached and the first Remaining Quota indication has not yet arrived, the subscriber is not able to consume quota. This is the only case where quota inaccuracy is not in favor of the subscriber.

Quota Accuracy

The accuracy of the quota levels for any subscriber is one of the most important aspects of the Quota Manager. When provisioning quota using an external server, there is a tradeoff between quota accuracy and the number of network messages.

Quota inaccuracies may occur during the changeover from one aggregation period to the next, or due to SCE failover. The level of inaccuracy depends on the configuration of the following parameters:

- Rate of the periodic remaining quota indications
- Quota dosage value

During an aggregation period changeover, the following occurs until the first quota indication is received in the new aggregation period:

- Any quota consumed by the subscriber is subtracted from the previous aggregation period.
- The quota dosage value limits the size of any quota error.
- The interval between the remaining quota indications limits the length of time during which consumed quota is subtracted from the previous aggregation period.

In cases of SCE failover, the following occurs between the last quota indication in the failed SCE and the first quota indication in the new active SCE:

- Any quota consumed by the subscriber is not removed from the subscriber buckets.
- The quota dosage value limits the size of any quota error.
- The length of time during which quota is consumed is limited by the interval between the remaining quota indications.

In all cases of inaccuracy, the quota remaining is calculated in favor of the subscriber. The exception is when the aggregation period changeover occurs when the subscriber quota is already breached.

To maximize accuracy, configure the rate of the periodic remaining quota indication to a high value, and configure the size of the quota dosage to a small value. Note that such a configuration causes performance degradation due to the high number of messages being generated in the network.

Configuring the Quota Manager

This module describes how to configure the Quota Manager

Information About Configuring the Quota Manager

This section describes how to configure the Quota Manager. Both the SCE platform and the SM must be properly configured.

Configuration Guidelines

When configuring the Quota Manager, make sure that the following conditions are met:

- Anonymous subscribers should be assigned a package that is not managed by an external quota server.

- For different packages, it is possible to configure different quota management modes (external or internal). However, packages with internal quota management should not have a quota profile configured in the 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 of type "Number of Sessions" should have a dosage value that is equal to the maximum bucket size. Quota Below Threshold indications are not generated for this type of bucket, so quota provisioning cannot be split into dosages (otherwise the subscriber would get breached between subsequent dosage provisions).

- The threshold value of the Quota Below Threshold indication must be configured to a lower value than the minimal quota dosage of all volume buckets.

Configuring the Quota Manager in the SM

The 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).

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

Configuring the Quota Profile Settings

The **[QuotaProfile.QUOTA-PROFILE-NAME]** section in the Quota Manager configuration file contains the following parameters:

- `bucket_sizes`

  A comma separated list that defines, for each bucket, the quota limits within an aggregation period. You must order the list such 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; "Volume (L3 KBytes)" or "Number of Sessions". The minimal bucket size is 1.

  There is no default value for this parameter.

- `dosage_sizes`

  A 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_sizes** parameter and the list must be of the same length. The minimal dosage size is 1 and the maximum is 1048576 (1 GB L3 KBytes or 1 million sessions).

  There is no default value for this parameter.

- `aggregation_period`

  Defines the aggregation period; i.e., the period of time for which an amount of quota or number of sessions will be granted to the subscriber.

  Possible values are **hourly**, **daily**, **weekly**, or **monthly**.

  The default value is **daily**.

- `day_of_month`

  Defines on which day of the month the aggregation period will start.

  Possible values for this parameter are **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 on which 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 will start. 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 **0** to **23**, minutes **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 **0** to **100**, where a gap of 0 means the aggregation period starts at the same time for all subscribers (no distribution) and a gap of 100 means 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 will be sent between midnight and midday (12:00). If the gap is 25, the update messages will be sent between midnight and 06:00.

- `packages`

    Defines the packages that will be associated with this profile.

    There is no default value for this parameter.

Configuring the Quota Profile Example

The following is an example of a configuration file:

```
[QuotaProfile.Profile1]
bucket_sizes=1000,2000,3000
dosage_sizes=10,50,100
aggregation_period=weekly
day_of_week=monday
time_of_day=00:00
gap=25
```

Configuring the Subscriber Manager

In order to use the quota manager within the SM, you must configure the SM configuration file **p3sm.cfg**. This configuration file resides in the *sm-inst-dir* /sm/server/root/config directory (*sm-inst-dir* refers to the SM 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 SM 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**.

- `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_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**.

Configuring the Quota Manager Section Example

The following is an example of a **[Quota Manager]** section from the SM configuration file:

```
[Quota Manager]
start=yes
log_failures=yes
log_all=no
```

How to Configure the SCA BB Application

In order for the SCA BB application to use the quota manager in the SM properly, it must be configured correctly, specifically the following are required:

- Packages configuration

  - Quota management should be set to "external"

  - When configuring buckets, the appropriate bucket type should be set. Available types are "Volume (L3 KBytes)" or "Number of Sessions"

  - In the usage limit definitions for the appropriate service rules, the appropriate buckets should be selected. Service traffic consumes quota from the selected buckets

  - The rule's breach handling action can be used to configure the level of service to assign to this traffic while the bucket is depleted

- RDRs

  - Set which quota RDRs should be generated and the rate for the remaining quota RDRs

Note   To enable the application to issue quota-related indications, it 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.

Setting Quota Management and Buckets

This section describes how to set the quota management mode and quota buckets.

Step 1   From the Package Settings dialog box, set the quota management mode to **External - replenished on external request**.

Step 2   From the Package Settings dialog box set each quota bucket type accordingly.

Each bucket can be of type **Volume** or **Session**.

The following figure shows the Package Settings dialog.

Figure 3-1   Package Settings Dialog

Setting Breach Handling Rules

This section describes how to set the breach handling rules.

Step 1   From the Edit Rule for Service dialog box, set the rules to apply upon quota breach.

The following figure shows the Edit Rule for Service dialog.

Figure 3-2   Edit Rule for Service - Breach Handling
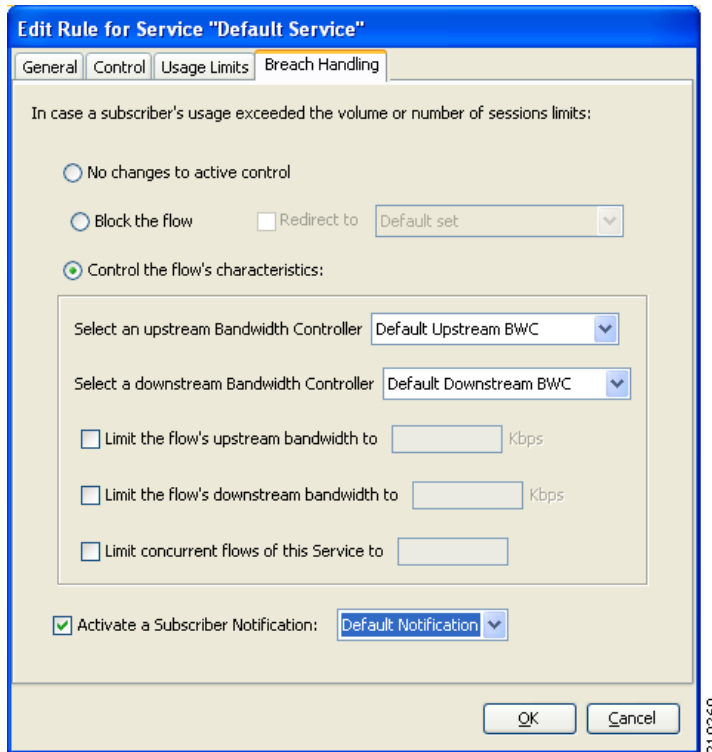
Setting Quota Bucket Service Consumption

This section describes how to set the quota buckets from which service is consumed.

Step 1   From the Edit Rule for Service dialog box, select the bucket to use for upstream and downstream traffic and select a quota bucket for session-based packages.

The following figure shows the Edit Rule for Service dialog.
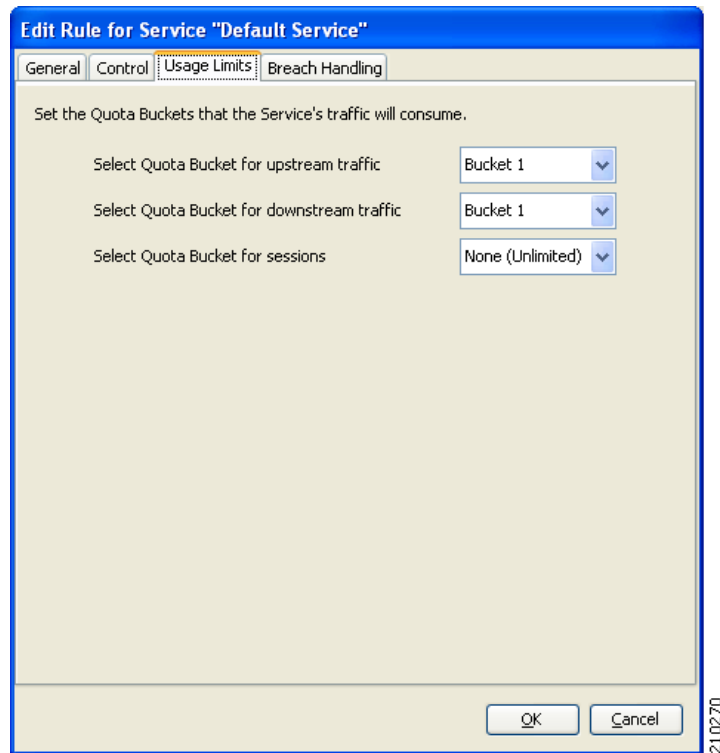
Figure 3-3   Edit Rule for Service - Usage Limits

Setting the Quota RDRs

This section describes how to set the quota RDRs.

SUMMARY STEPS

1. From the RDR Settings dialog box, select the Quota RDRs tab.

2. Select the quota RDRs to be generated.

3. Quota Breach RDRs should be generated if you wish to generate an RDR when the quota is breached. It is recommended to set this.

4. Remaining Quota RDRs should be generated if you wish to keep the Quota Manager updated with the remaining quota.

5. Quota Threshold RDRs should be generated if you wish to generate an RDR when subscriber quota drops below the defined threshold.

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

DETAILED STEPS

Step 1   From the RDR Settings dialog box, select the Quota RDRs tab.

The following figure shows the RDR Settings dialog.

Figure 3-4   RDR Settings
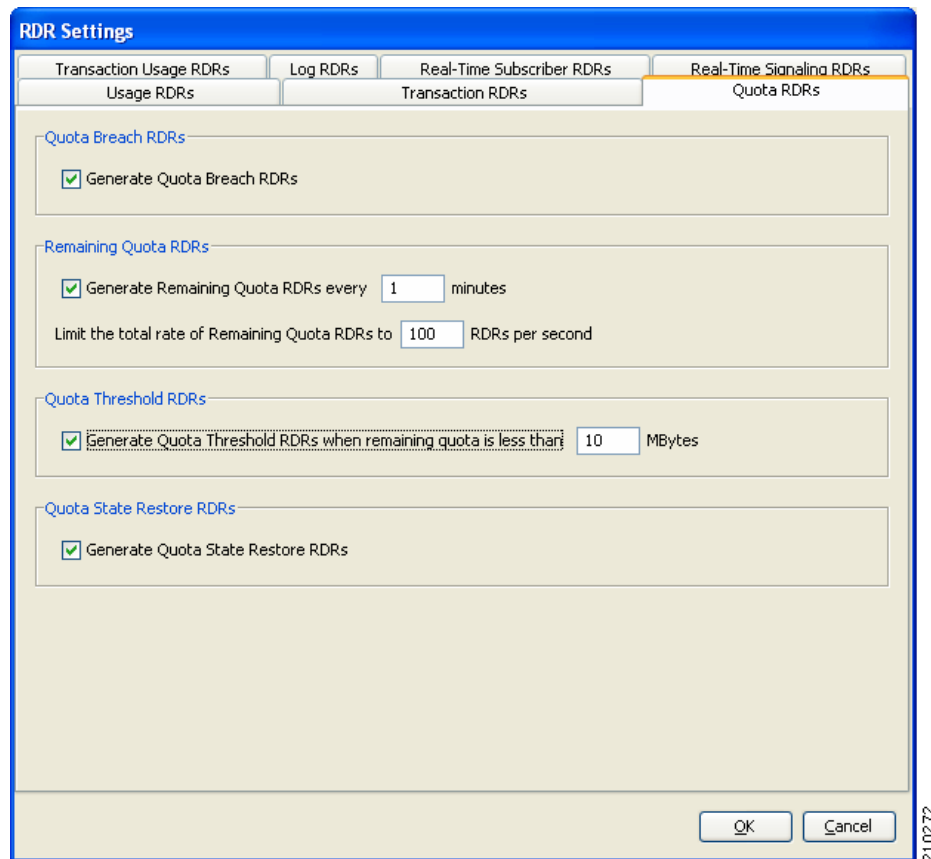
Step 2   Select the quota RDRs to be generated.

  a. Quota Breach RDRs should be generated if you wish to generate an RDR when the quota is breached. It is recommended to set this.

  b. Remaining Quota RDRs should be generated if you wish to keep the Quota Manager updated with the remaining quota.

  It is possible to set how often these RDRs are generated and how many should be generated per second.

  ✎

  Note   A high generation rate for these RDRs results in increased accuracy of the remaining subscriber quota; however, there is a performance penalty for having a high generation rate.

  c. Quota Threshold RDRs should be generated if you wish to generate an RDR when subscriber quota drops below the defined threshold.

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

Enabling the RDR Formatter to Issue Quota-Related Indications

This section describes how to enable the RDR formatter to issue quota-related indications by configuring the RDR formatter on the SCE.

Step 1   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-IDtag numbercategory-numbernumber
```

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

C H A P T E R 4

Using the Quota Manager CLU

This module describes the Quota Manager CLU.

Information About the Quota Manager CLU

The quota manager CLU (p3qm) displays the Quota Manager configuration, status, and statistics. The command format is **p3qm <operation>**. The following table lists the p3qm operations.

Table 4-1   p3qm Operations

Operation	Description
--show-config[**--package** *packageId*]	Displays all the Quota Manager profiles. Use the --package option to display only a certain profile.
--show-quota-s *subscriber name*	Displays the quota status of a specific subscriber. Use the -s option to specify the subscriber name.
--replenish-quota-s *subscriber name*	Replenishes the quota buckets for a specific subscriber without starting a new aggregation period. Use the -s option to specify the subscriber name. Use this CLU in cases when it is required to bypass the Quota Manager internal replenishment logic.
--get-quota-s *subscriber name*	Triggers a remaining quota indication to be sent from the SCE for a specific subscriber. Use the -s option to specify the subscriber name. After using this CLU, the output is the same as the show-quota CLU. However, after using this get-quota CLU, the Quota Manager is up-to-date with the SCE and so the displayed information is the latest available. Use this CLU if the quota dosage is large and the rate of the remaining quota indications is low.

Table 4-1   *p3qm Operations*

Operation	Description
--set-quota-s *subscriber name*-**b/--bucket** *bucket ID=bucket value*	Sets the quota for a specific bucket of a subscriber. After the quota has been set, the QM initiates a remaining quota RDR from the SCE; therefore, if the subscriber was breached, new quota is available immediately.
--add-quota-s *subscriber name*-**b/--bucket** *bucket ID=bucket value*	Adds quota to a specific bucket of a subscriber. After the quota has been added, the QM initiates a remaining quota RDR from the SCE; therefore, if the subscriber was breached, new quota is available immediately.
--enable-logging-s *subscriber name*	Use this CLU for debugging or troubleshooting. It adds all quota events and quota provisions that are related to a specific subscriber to the user log. Use the -s option to specify the subscriber name. There is no output from this CLU.
--disable-logging-s *subscriber name*	Use this CLU to disable logging of quota events and quota provisions that are related to a specific subscriber to the user log. Use the -s option to specify the subscriber name. There is no output from this CLU.
--show-statistics[**-n/--ne-name**=*NAME*]	Displays counters of Quota Manager messages handled. Use the -n option to display the statistics of a specific SCE.
--reset-statistics[**-n/--ne-name**=*NAME*]	Resets counters of Quota Manager messages handled. Use the -n option to reset the counters of a specific SCE.
--show-connections[**-n/--ne-name**=*NAME*]	Displays all of the SCE connections to the Quota Manager along with their connection status. Use the -n option to display the connection status of a specific SCE.
--help	Displays a list of available operations and arguments, with a short explanation of their meanings.

Viewing the Quota Manager Configuration

The following is an example using the **p3qm** command-line utility with the **show-config** operation:

```
>p3qm --show-config Quota-profile1:
Bucket Sizes = 1000,1000
Dosage Sizes = 10,10
Aggregation Period = Daily
Day of Week = Sunday
Time of Day = 00:00
Aggregation Period Gap = 0
Modification Timestamp = Thu Aug 17 14:50:300 IDT 2006
Command terminated successfully
>
```

Viewing the Current Quota Status

The following is an example using the **p3qm** command-line utility with the **show-quota** operation:

```
>p3qm --show-quota -s subscriber namePackage ID = 1
Last SCE that consumed quota = 10.56.217.81
Aggregation Period:
Last Replenish Time = Thu Aug 17 15:41:23 IDT 2006
Aggregation Period End = Fri Aug 18 00:00:00 IDT 2006
Quota Buckets:
Bucket 1 - Remaining Quota 495 (Last quota reported by SCE is 5)
Bucket 2 - Remaining Quota 1000 (Last quota reported by SCE is 10)
Command terminated successfully
>
```

Viewing the Quota Manager Statistics

The following is an example using the **p3qm** command-line utility with the **show-statistics** operation, the number in parenthesis is the rate:

```
>p3qm --show-statisticsQuota Manager Statistics:
=========================
SCE2000 (10.56.209.197) : connected
Quota State Restore Notifications:      34 (0.4)
Quota Status Notifications:             0 (0)
Quota Below Threshold Notifications:    10 (0)
Quota Depleted Notifications:           0 (0)
Quota Update Sent:                      128 (45.4)
Quota Update Success Acknowledge:       128 (45.4)
Quota Update Failure Acknowledge:       0 (0)
Command terminated successfully
>
```

Viewing the SCE Connections

The following is an example using the **p3qm** command-line utility with the **show-connections** operation:

```
>p3qm --show-connectionssce1 (10.56.217.81) : connected
sce2 (10.56.217.82) : not connected
Command terminated successfully
>
```

Setting a Subscriber's Quota

The following is an example using the **p3qm** command-line utility with the **set-quota** operation:

```
>p3qm --set-quota -s sub1 -b 1=1000,2=2000Command terminated successfully
>
```
This command sets sub1's quota bucket 1 to 1000 and quota bucket 2 to 2000.

Adding to a Subscriber's Quota

The following is an example using the **p3qm** command-line utility with the **add-quota** operation:

```
>p3qm --add-quota -s sub1 -b 1=1000,2=2000Command terminated successfully
>
```

This command adds 1000 to sub1's quota bucket 1 and 2000 to sub1's quota bucket 2.

Replenishing Subscriber Quota

The following is an example using the **p3qm** command-line utility with the **replenish-quota** operation:

```
>p3qm --quota-replenish -s subscriber nameQuota was replenished:
Bucket 1: 1000
Bucket 2: 500
Command terminated successfully
>
```

Getting Subscriber Quota

The following is an example using the **p3qm** command-line utility with the **get-quota** operation:

```
>p3qm --get-quota -s subscriber nameQuota status was sent from SCE:
Package ID = 1
Last SCE that consumed quota = 10.56.217.81
Aggregation Period:
Last Replenish Time = Thu Aug 17 15:41:23 IDT 2006
Aggregation Period End = Fri Aug 18 00:00:00 IDT 2006
Quota Buckets:
Bucket 1 - Remaining Quota 495 (Last quota reported by SCE is 5)
Bucket 2 - Remaining Quota 1000 (Last quota reported by SCE is 10)
Command terminated successfully
>
```

Note   The **--get-quota** CLU is different from the **--show-quota** CLU in that it requests the SCE to send a remaining quota indication, waits for the response, and displays the quota. The **--show-quota** CLU displays the quota without getting the latest update from the SCE. Therefore, the **--get-quota** CLU gives more accurate results.