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Billing and Revenue Management

Collecting Revenue Assurance Data

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Preface

This document describes Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager and Revenue Assurance Center. This information includes the concepts, installation, and configuration of Revenue Assurance Manager for Pipeline Batch Rating and Billing as well as related topics.

Audience

This document is intended for personnel who are involved in revenue assurance or billing and rating.

Accessing Oracle Communications Documentation

BRM documentation and additional Oracle documentation; such as Oracle Database documentation, is available from Oracle Help Center:

<http://docs.oracle.com>

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Document Revision History

The following table lists the revision history for this book.

Version	Date	Description
E16713-01	November 2011	Initial release.

Version	Date	Description
E16713-02	May 2012	Documentation updates for BRM 7.5 Patch Set 1. <ul style="list-style-type: none"> ■ Made minor formatting and text changes.
E16713-03	March 2013	Documentation updates for BRM 7.5 Patch Set 4. <ul style="list-style-type: none"> ■ Replaced multidatabase information with multischema information.
E16713-04	August 2013	On HP-UX IA64, BRM 7.5 is certified as of BRM 7.5 Patch Set 5. Documentation added for HP-UX IA64.
E16713-05	February 2014	Documentation updates for BRM 7.5 Patch Set 7. <ul style="list-style-type: none"> ■ Made minor formatting and text changes.
E16713-06	October 2014	Documentation updates for BRM 7.5 Patch Set 10. <ul style="list-style-type: none"> ■ Updated the "Starting and Using Revenue Assurance Center" section.
E16713-07	January 2015	Documentation updates for BRM 7.5 Patch Set 11. <ul style="list-style-type: none"> ■ Made minor formatting and text changes.
E16713-08	August 2016	Documentation updates for BRM 7.5 Patch Set 16. <ul style="list-style-type: none"> ■ Removed references of Business Operations Center.

Understanding Revenue Assurance Manager

This chapter provides an overview of Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager.

Important: Revenue Assurance Manager is an optional feature that you install separately.

Before using Revenue Assurance Manager, you should be familiar with BRM concepts and system architecture. See *BRM Concepts* for more information.

Note: See ["Installing Revenue Assurance Manager"](#) for installation procedures.

About Revenue Assurance Manager

You use Revenue Assurance Manager to verify the end-to-end completeness, accuracy, and integrity of BRM billing and pipeline batch rating results. You can analyze revenue assurance data to find revenue leakage in your system.

You obtain revenue assurance data by auditing the results of these processes:

- **Billing:** Revenue Assurance Manager provides statistics such as the number of accounts billed or invoiced, the total revenue, and the number of records that were successfully billed or failed to be billed.

See ["About Collecting Revenue Assurance Data from Billing"](#) for more information.

- **Pipeline batch rating:** Revenue Assurance Manager provides statistics such as total duration and charges, retail and wholesale amounts, and total discount amounts.

See ["About Collecting Revenue Assurance Data from Pipeline Batch Rating"](#) for more information.

Revenue Assurance Manager stores the data it collects in the BRM database. There are two ways for you to view this data.

- **Revenue Assurance Manager reports:** You can generate summary and detail reports from revenue assurance data for billing, and pipeline rating. You can change the report parameters to meet your business needs.

See *BRM Reports* for more information.

- **Revenue Assurance Center:** You can use the Revenue Assurance Center application to search for and view revenue assurance statistics generated from billing and pipeline rating. See the Revenue Assurance Center Help for detailed instructions about using the application.

See ["Installing Revenue Assurance Center"](#) for installation information.

You can also configure Revenue Assurance Manager to send alerts when revenue assurance data passes a threshold that you set. For example, you can configure an alert to be sent when the number of suspended EDRs exceeds 100,000. See ["About Revenue Assurance Alerts"](#) for more information.

About Collecting Revenue Assurance Data from Billing

You can generate revenue assurance billing data from the following BRM billing processes:

- Regular billing
- Bill Now
- On-demand billing
- Auto-triggered billing
- Trial billing
- Invoicing
- Deferred actions

The revenue assurance data generated from billing consists of statistics such as the number of accounts billed, accounts that failed to be billed, the time of the billing process, and the revenue details. BRM stores the revenue assurance data collected from billing in `in/process_audit/billing` objects.

To collect revenue assurance data for billing, you must configure BRM billing utilities to generate revenue assurance data. See ["Configuring BRM Billing to Collect Revenue Assurance Data"](#) for more information.

After revenue assurance data has been collected from billing, you can view the data by using Revenue Assurance Center or Revenue Assurance reports. See ["About Viewing Revenue Assurance Data Collected from Billing"](#) for more information.

How Revenue Assurance Data is Collected from Billing

Revenue Assurance Manager collects data from control points in billing utilities. Unlike the control points in pipeline rating, billing control points are preconfigured and you cannot change them.

These are the billing utilities and the data that is collected from them:

- **pin_bill_accts:** Anticipated revenue.
- **pin_collect:** Revenue collected.
- **pin_inv_accts:** Invoices generated, including total records processed, records that have been successfully invoiced, and failed records.
- **pin_deferred_act:** The number of scheduled deferrals executed.
- **pin_cycle_fees:** The amount of cycle fees generated.

Revenue assurance data for billing is stored in `/process_audit/billing` objects in the BRM database.

About Viewing Revenue Assurance Data Collected from Billing

You can view revenue assurance data from billing by using Revenue Assurance reports or by using Revenue Assurance Center.

Note: There are some restrictions on the types of data that can be displayed in Revenue Assurance Center:

- Revenue assurance data collected for trial billing is viewable only in reports.
- Revenue Assurance Center can display only split revenue assurance data.

See "[About Splitting Revenue Assurance Data into Detailed Categories](#)" for more information.

Revenue Assurance reports includes both summary and detail reports for billing data. You can customize the reports. See *BRM Reports* for more information.

When you use Revenue Assurance Center to view revenue assurance data for billing, you can search for data based on:

- Billing segments.
- Accounts billed on the same accounting day of month (DOM).
- A combination of billing segment and DOM.

You can choose to display data from all control points or from selected control points. These are the control points:

- Revenue Anticipated

Note: A summary of the revenue assurance data collected from billing by billing segments is available from control points in `pin_bill_accts` only.

- Revenue Collected
- Invoice Generated
- Scheduled Deferrals Executed
- Cycle Fees Generated

[Figure 1–1](#) shows a typical Revenue Assurance Center billing data screen:

Figure 1–1 Revenue Assurance Billing Summary

About Splitting Revenue Assurance Data into Detailed Categories

You can split revenue assurance billing data into more detailed categories, such as amounts associated with A/R items, billable items, and suppressed bills. Splitting revenue assurance billing data allows you to more accurately pinpoint the source of revenue leakage in your system.

Split revenue assurance data is automatically generated by these billing operations:

- Bill Now
- On-demand billing
- Auto-triggered billing

The following utilities offer a **-split** parameter that you can use to separate data for regular billing and trial billing:

- **pin_bill_accts**
- **pin_trial_bill_accts**

Important: If you intend to collect revenue assurance data from billing, be sure to use the **-split** parameter to **pin_bill_accts** and **pin_trial_bill_accts** when you use these utilities.

See the discussion of billing utilities in *BRM Configuring and Running Billing* for more information on **pin_bill_accts** and **pin_trial_bill_accts**.

You can view split revenue assurance data in Revenue Assurance Center or in Revenue Assurance reports:

- Revenue Assurance Center automatically displays split data. It cannot display data that is not split.
- You can configure Revenue Assurance Reports to display split or unsplit data. See "About the Split Method Parameter" in *BRM Reports* for more information.

Split Revenue Assurance Data

Split revenue assurance data includes the following categories:

- **A/R items:** If service types are associated with these items, the amount for each service type is also generated:

- **Adjustments:** Adjustment charges
- **Payments:** Total number of payments received
- **Payment reversals:** Total payment reversals
- **Disputes:** Sum of disputed amounts
- **Settlements:** Sum of settlements
- **Refunds:** Total refunds
- **Write off:** Total number of written-off accounts
- **Write-off reversals:** Total number of write-off reversal accounts
- **Billable items:** The billable items and their subtypes that you have configured; for example, usage charges, recurring charges, one-time charges, and discounts.
- **Miscellaneous charges:** If billable items are not configured, the split revenue assurance data is stored as miscellaneous charges.
- **Connections:** The number of billed connections, where a connection represents a device or phone number.
- **Bills suppressed:** The number of suppressed bills, the reason for the suppression, and the anticipated revenue.

Note: The bills-suppressed data is generated by regular billing, trial billing, and auto-triggered billing only.

Splitting Revenue Assurance Data by Type of Charge

You can also split revenue assurance data based on the type of charge, such as discounts, usage charges, and one-time and recurring charges. You do this by setting up custom billable items and item subtypes. If you do not configure billable item subtypes, the split revenue assurance data is stored as miscellaneous charges.

See "[Configuring Item Subtypes](#)" for more information.

About Collecting Revenue Assurance Data from Pipeline Batch Rating

You can collect revenue assurance data to analyze the effect of pipeline rating on Event Data Records (EDRs). You configure Revenue Assurance Manager to collect statistics on EDRs at various points in your pipelines, and then compare those statistics to see how a batch of EDRs changes as it is processed.

The statistics collected can include:

- The number of EDRs in the batch
- Retail charged amount
- Event wholesale value
- Discounts applied
- Total time usage
- Amount of data transferred
- When a call started
- When a call ended

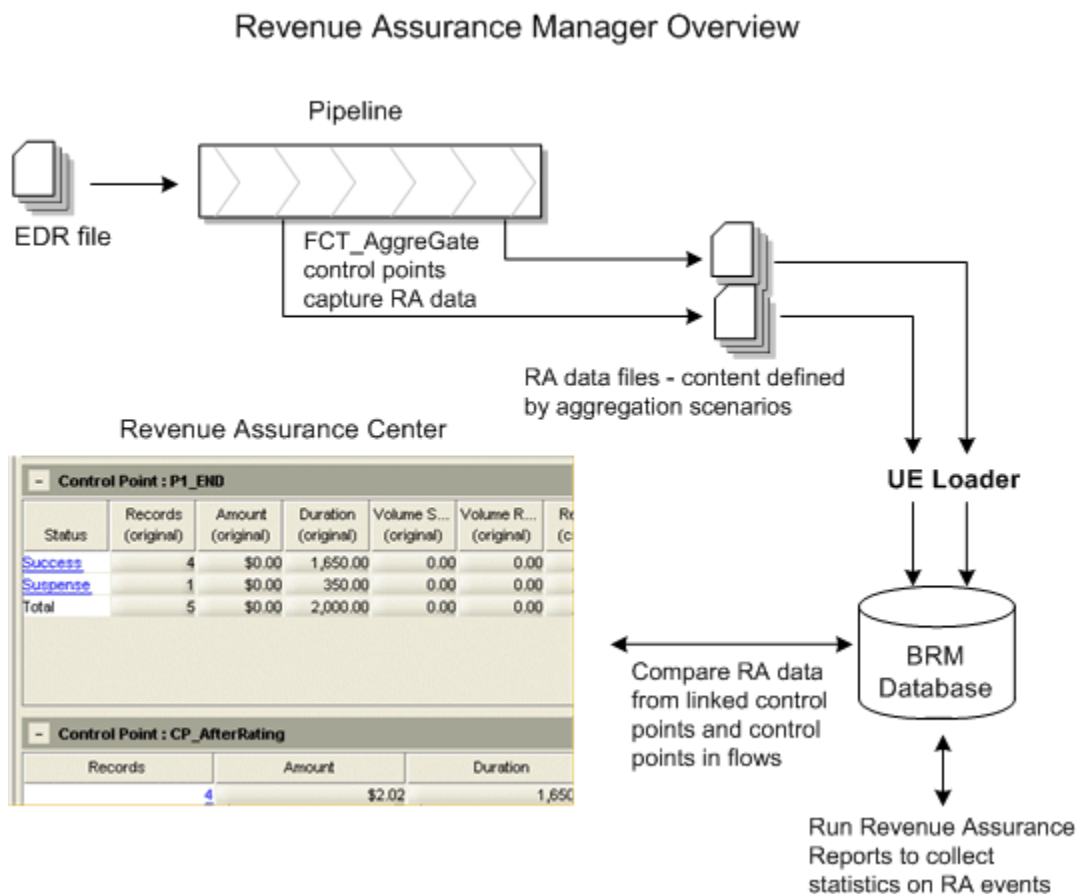
Revenue assurance data is collected and aggregated at control points that you configure in pipelines. You establish control points by adding the FCT_AggrGate module at appropriate pipeline locations. You determine the data to be collected by specifying aggregation scenarios used by the module.

You can configure related control points into flows that enable you to examine data for a batch sequentially. You can also link pairs of control points to see original and current values.

FCT_AggrGate outputs aggregated data into flat files. You configure the Batch Controller to send these flat files to the Universal Event (UE) Loader as they are created. UE Loader parses the flat files and then calls opcodes to load the information into the database as `/process_audit/batchstat` objects.

Figure 1–2 shows how revenue assurance data is collected from EDRs in pipeline batch rating, stored in the BRM database, and viewed by using Revenue Assurance Center or Revenue Assurance Reports:

Figure 1–2 Revenue Assurance Data Collection



Collecting revenue assurance data from pipeline batch rating involves these tasks:

- Configuring event notification to capture data on written-off EDRs and set up revenue assurance alerts.

See ["About Using Event Notification to Generate Revenue Assurance Data"](#) for more information.

- Configuring control points in your pipelines to determine where revenue assurance data is captured.
See ["About Control Points"](#) for more information.
- Associating an aggregation scenario with each of your control points to determine how revenue assurance data is organized. Revenue Assurance Manager includes preconfigured aggregation scenarios that group revenue assurance statistics by using different fields.
See ["About Aggregation Scenarios"](#) for more information.
- Linking pairs of control points related to rating, rerating, and written-off EDRs. Revenue Assurance Center uses these linked pairs to establish the original and current values for a set of EDRs.
See ["About Linking Pairs of Rating, Rerating, and Written-Off Control Points"](#) for more information.
- Defining flows, which are ordered lists of control points that Revenue Assurance Center uses to display revenue assurance data. Flows allow you to track revenue assurance data for EDR batches at various stages during pipeline processing.
See ["Adding Control Points to Flows"](#) for more information.
- Configuring Universal Event (UE) Loader to load revenue assurance data into the database.
See ["About Using UE Loader to Load Revenue Assurance Data"](#) for more information.
- Configuring alerts to be sent when revenue assurance data passes a threshold that you set.
See ["Generating Revenue Assurance Alerts"](#) for more information.

About Using Event Notification to Generate Revenue Assurance Data

Revenue Assurance Manager uses event notification to collect data on written-off EDRs and set up revenue assurance alerts.

The following events are generated specifically to facilitate the revenue assurance event notification process:

- **/event/notification/suspense/writeoff** - When suspended EDRs are written off, Suspense Manager generates this event. By default, when this event occurs, the PCM_OP_PROCESS_AUDIT_CREATE_WRITEOFF_SUMMARY opcode is called.
- **/event/notification/ra_threshold** - When specified conditions for producing revenue leakage alerts occur, the **load_pin_config_ra_thresholds** utility generates this event. By default, when this event occurs, the PCM_OP_PROCESS_AUDIT_POL_ALERT policy opcode is called. See ["load_pin_config_ra_thresholds"](#) for more information.

See ["Configuring Event Notification"](#) for more information on configuring event notification for Revenue Assurance Manager.

About Control Points

You establish control points in batch pipelines to determine where Revenue Assurance Manager collects data. You can configure control points in locations that enable you to compare data from different stages in the rating processes.

You define a control point by adding the FCT_AggreGate module to the pipeline in the desired location and specifying the control point name in the module registry. Each control point must have a unique name that describes its purpose. For example, in a rating pipeline, you could have control points named Rating and CP_After_Rating. See ["Configuring Revenue Assurance Manager"](#) for more information.

Each control point is associated with an aggregation scenario that specifies the data to be collected and how it should be organized. See ["About Aggregation Scenarios"](#) for more information.

You add related control points to *flows*. In Revenue Assurance Center, you can view data from all the control points in a flow. This enables you to follow the progress of EDR batches of EDRs through the pipeline. See ["About Flows"](#) for more information.

About Aggregation Scenarios

Each control point requires an aggregation scenario to specify the data that the control point collects and how the data will be organized.

An aggregation scenario specifies:

- The EDR fields to collect data from. For example, a scenario can collect information from the discount amount or duration fields.
- Aggregation functions to apply to the data. For example, you can add data together or average it.
- Fields by which to group the data collected. For example, you can group data by service type. In this case, the data for each batch is grouped by the type of service, such as TEL, SMS, or GPRS.

You can also collect revenue assurance data on more than one grouping field. For example, in the BatchStat_SvcType_Status scenario, the grouping fields are Service Type and EDR Status. The revenue assurance data collected is the EDR status such as Duplicate, Rejected, or Successful for each service type.

You specify the scenario to use when you define a control point in the FCT_AggreGate module registry. Scenarios can be used by any number of control points. See ["Configuring the FCT_AggreGate Module to Collect Revenue Assurance Data"](#) for more information.

Revenue Assurance Manager provides a number of preconfigured scenarios. These scenarios are suitable for use in a production system. You can also create new scenarios if necessary. See ["Preconfigured Aggregation Scenario Details"](#) for descriptions of the preconfigured scenarios. See ["About the Revenue Assurance Manager Opcodes"](#) for information about creating new scenarios.

For general information on working with pipeline aggregation and aggregation scenarios, see the discussion of setting up pipeline aggregation in *BRM Configuring Pipeline Rating and Discounting*.

About Linking Pairs of Rating, Rerating, and Written-Off Control Points

Certain types of control points must be linked to establish *original* and *current* values displayed in Revenue Assurance Center. You should link these types of control points:

- A rating control point to a rerating control point.
- A rating control point to a writeoff control point.
- A rerating control point to a writeoff control point.

See ["Linking Rating, Rerating, and Write-Off Control Points"](#) for details on creating control point links.

When pairs of control points are linked, Revenue Assurance Center shows the linked control points in the same area. Values for the first control point are marked as *original* values, and the last control point as *current* values.

About Flows

A flow is an ordered set of related control points that you group together for convenient searching and viewing in Revenue Assurance Center. You can add any number of control points to a flow, from any pipelines that are relevant. See ["Adding Control Points to Flows"](#) for information about creating flows.

You use Revenue Assurance Center to display data for flows. Each control point appears in its own area. In this example, you can see two control points (P1_END and CP_AfterRating) from Flow12. The second control point shows the effect that rating had on a small batch of EDRs.

Figure 1–3 shows the Revenue Assurance Center screen:

Figure 1–3 Revenue Assurance Center

Revenue Assurance Center Rating Summary

Search Criteria

Revenue Assurance scope : Batch Rating (by Load Time)

Flow : Flow12 **Load Time :** Start : 04/Feb/2001 13:23:52 End : 23/Feb/2012 13:23:52

This is a flow with four control points.

Transaction period : Earliest : 09/Aug/2010 22:09:00 Latest : 10/Aug/2010 12:19:19

Control Point : P1_END

Records	Amount	Duration	Volume Sent	Volume Received
6	\$0.00	1,720.00	0.00	0.00

Control Point : CP_AfterRating

Records	Amount	Duration	Volume Sent	Volume Received
4	\$2.24	1,300.00	0.00	0.00

About Using UE Loader to Load Revenue Assurance Data

In order to view batch pipeline revenue assurance data, you must first load that data into **/process_audit** objects in the BRM database. You use Universal Event (UE) Loader to load the data.

The UE Loader loads revenue assurance data into the following **/process_audit** objects:

- **/process_audit/pipeline** objects store information about processed EDRs.
- **/process_audit/batchstat** objects store information about the revenue assurance data collected for specific scenarios.

You can configure the BRM Batch Controller to probe automatically for revenue assurance data files and then call UE Loader to load them into the database. You can also decide to load the data periodically by using **cron** or a similar program.

See ["Setting Up UE Loader to Load Revenue Assurance Data into the Database"](#) and ["Setting Up Batch Controller to Call UE Loader"](#) for more information.

About the Revenue Assurance Data Collected in Rated Event Loader

Revenue Assurance Manager collects data from Rated Event (RE) Loader. BRM uses RE Loader to load events that have been rated or rerated with pipeline batch rating. See the discussion of Rated Event Loader in *BRM Configuring Pipeline Rating and Discounting* for more information.

The revenue assurance data collected from RE Loader include:

- Total revenue generated by the batch.
- Total number of EDRs loaded.

You can view the RE Loader data in Revenue Assurance Center or in Revenue Assurance reports.

When the rated EDRs are loaded in RE Loader, either all the EDRs are loaded, or they all fail. There is no possibility of some records getting loaded and some records failing. In Revenue Assurance Manager, the data collected for RE Loader is not grouped by status or any other fields.

You must load the **CollectProcessAuditForIREL.sql** file to enable the collection of revenue assurance data from RE Loader. See ["Loading the CollectProcessAudit Trigger in Rated Event Loader"](#) for information on loading this trigger.

About Collecting Revenue Assurance Data on Written-Off EDRs

You can use Revenue Assurance Manager to view statistics about the number of EDRs that have been written off.

When an EDR is written off through Suspense Manager, an **/event/notification/suspense/writeoff** event is generated. You configure event notification so that Revenue Assurance Manager collects data every time such an event occurs. The data collected from a written-off EDR includes the original batch ID and the number of EDRs that were written off in that batch of EDRs.

See ["Setting Up Revenue Assurance Manager to Collect Data on Written-Off EDRs"](#) for configuration information.

Installing Revenue Assurance Manager

This chapter describes how to install Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager and Revenue Assurance Center.

Before you read this chapter, you should be familiar with BRM concepts and architecture. See:

- *BRM Concepts*
- [Understanding Revenue Assurance Manager](#)

Important: Revenue Assurance Manager and Revenue Assurance Center are optional features that you install separately.

System Requirements

Revenue Assurance Manager server component is supported on the HP-UX IA64, Linux, AIX, and Solaris operating systems. For information on disk space requirements for these operating systems, see *BRM Installation Guide*.

Revenue Assurance Center is supported on the Windows platform and requires approximately 100 MB of disk space.

Software Requirements

Before installing Revenue Assurance Manager, you must install:

- Third-Party software, which includes the Perl libraries and JRE required for installing BRM components. See the instructions for installing the Third-Party software in *BRM Installation Guide*.
- BRM. See *BRM Installation Guide*.
- Oracle version 10g or 11g.

Caution: If you are using an earlier version of Oracle, you must upgrade it *before* you install Revenue Assurance Manager. For information on upgrading Oracle, see your Oracle documentation.

Before installing Revenue Assurance Center, you must install BRM. See *BRM Installation Guide* for install instructions.

Installing Revenue Assurance Manager

Note: If you already have Revenue Assurance Manager installed, you must uninstall it before installing a new version.

To install Revenue Assurance Manager:

1. Download the software to a temporary directory (*temp_dir*).

Important:

- If you download to a Windows workstation, use **FTP** to copy the **.bin** file to a temporary directory on your UNIX server.
 - You must increase the heap size used by the Java Virtual Machine (JVM) before running the installation program to avoid “Out of Memory” error messages in the log file. See “Increasing Heap Size to Avoid “Out of Memory” Error Messages” in *BRM Installation Guide* for more information.
-

2. Go to the directory where you installed the Third-Party package and source the **source.me** file.

Caution: You must source the **source.me** file to proceed with installation, otherwise “suitable JVM not found” and other error messages appear.

Bash shell:

```
% source source.me.sh
```

C shell:

```
% source source.me.csh
```

3. Go to *temp_dir* and enter this command:

```
% 7.5.0_RevAssuranceMgr_platform_opt.bin
```

where *platform* is the operating system name.

Note: You can use the **-console** parameter to run the installation in command-line mode. To enable a graphical user interface (GUI) installation, install a GUI application such as X Windows and set the **DISPLAY** environment variable before you install the software.

4. Follow the instructions displayed during installation. The default installation directory for Revenue Assurance Manager is **/opt/portal/7.5**.

Note: The installation program does not prompt you for the installation directory if BRM or Revenue Assurance Manager is already installed on the machine and automatically installs the package at the *BRM_Home* location.

5. Go to the directory where you installed the Revenue Assurance Manager package and source the **source.me** file:

Bash shell:

```
% source source.me.sh
```

C shell:

```
% source source.me.csh
```

6. Change directory to the *BRM_Home/setup* directory and run the **pin_setup** script.

Note: The **pin_setup** script starts all required BRM processes.

7. If your event tables are partitioned, run the **partition_utils** utility with the **-o update** parameter from the *BRM_Home/apps/partition_utils* directory:

```
% perl Bin_Home/bin/partition_utils -o update
```

See "Updating Partitions" and "partition_utils" in *BRM System Administrator's Guide* for more information.

Your Revenue Assurance Manager installation is now complete.

Loading the CollectProcessAudit Trigger in Rated Event Loader

This section explains how to define the **CollectProcessAuditForIREL** trigger in Rated Event (RE) Loader. You must define this trigger in RE Loader before using Revenue Assurance Manager. **CollectProcessAuditForIREL** defines event ID and batch ID mapping in rated EDRs and loads them into the BRM database.

To load the trigger:

1. Go to the *BRM_Home/sys/data/config* directory.
2. Run the following command:

```
% sqlplus login/password @$ORACLE_SID @CollectProcessAuditForIREL.sql
```

where *ORACLE_SID* is the BRM database alias.

Configuring Universal Event Loader to Load Revenue Assurance Data

To configure the Universal Event (UE) Loader properties file to load revenue assurance data:

1. Open the UE Loader properties file (*BRM_Home/apps/uel/Infranet.properties*) in a text editor.
2. Change this setting:

```
infranet.uel.date_pattern = dd/MMM/yyyy:hh:mm:ss a zzzz
```

to this:

```
infranet.uel.date_pattern = yyyyMMddHHmmss.
```

3. Change the `infranet.uel.max_threads` entry to 1.
4. (Optional) Change the `infranet.uel.max_load_errors` entry.

This entry determines whether UE Loader will continue loading records even after receiving errors. UE Loader stops loading records when the number of errors it receives reaches the error limit defined in `infranet.uel.max_load_errors`. To ignore the errors and continue loading the remaining records, set this entry to a higher number. The default is 9999.

5. Save and close the file.

About Installing Revenue Assurance Center

Revenue Assurance Center is an optional client application you can use to search for and display revenue assurance information that is stored in the BRM database.

Before installing Revenue Assurance Center, obtain information about the machine running the CM to which Revenue Assurance Center will connect, such as:

- A location for the software (if other than the default)
- Computer or server name
- Port number
- Database number

Installing Revenue Assurance Center

To install Revenue Assurance Center:

1. Download the software to a temporary directory (*temp_dir*).
2. Select the `.zip` file, and click the Install button.

You will be prompted for the following information:

- The destination folder. Click **Next** to use the default location, or enter a different directory.
 - On the Connection Manager screen, enter the server, port, and database information. Click **Next**.
 - On the Select Program Folder screen, accept the default program folder, **BRM**, or select a new one. Click **Next**.
3. On the Start Copying Files screen, click **Next** to start installing the application.
 4. Click **Finish** to complete the installation process.

Starting and Using Revenue Assurance Center

To start Revenue Assurance Center:

1. From the start options, choose **Revenue Assurance Center**, which is under **Portal**.
The Revenue Assurance Center user interface opens.

Note: When prompted, enter the BRM login and password. Contact your system administrator to obtain the default username and password.

2. Click the Revenue Assurance Center **Help** button to display information on how to use Revenue Assurance Center.

See "[Customizing Revenue Assurance Center](#)" for information on how you can change features in Revenue Assurance Center.

Uninstalling Revenue Assurance Manager

To uninstall Revenue Assurance Manager, run the *BRM_Home/uninstaller/RevAssuranceMgr/uninstaller.bin*.

Setting Up Revenue Assurance Manager for Pipeline Batch Rating

This chapter describes how to configure Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager to collect revenue assurance data from pipeline batch rating.

Before reading this chapter, you should be familiar with the following tasks and concepts:

- [About Collecting Revenue Assurance Data from Pipeline Batch Rating](#)
- "About pipeline rating" in *BRM Configuring Pipeline Rating and Discounting*
- "Using event notification" in *BRM Developer's Guide*
- The discussion of working with aggregation scenarios in the Pricing Center Help

Configuring Revenue Assurance Manager

To set up Revenue Assurance Manager for pipeline batch rating, you need to complete the following tasks:

- Configure event notification to notify Revenue Assurance Manager when events occur.
See ["Configuring Event Notification"](#) for more information.
- Choose scenarios that determine how the revenue assurance data is grouped.
See ["Selecting Aggregation Scenarios"](#) for more information.
- Identify control points for pipeline data collection.
See ["Identifying Control Point Locations for Revenue Assurance Data"](#) for more information.
- Configure FCT_Aggregate to use your aggregation scenarios and control points.
See ["Configuring the FCT_Aggregate Module to Collect Revenue Assurance Data"](#) for more information.
- Configure SimpleSample files to map the batchIDs of the EDRs.
See ["Configuring SimpleSample Files"](#) for more information.
- Add related sets of control points to flows.
See ["Adding Control Points to Flows"](#) for more information.
- Link control points for rating, rerating, and written-off EDRs.

See ["Linking Rating, Rerating, and Write-Off Control Points"](#) for more information.

- Configure Universal Event (UE) Loader to load revenue assurance data into the database.

See ["Setting Up UE Loader to Load Revenue Assurance Data into the Database"](#) for more information.

- Configure Batch Controller to call UE Loader.

See ["Setting Up Batch Controller to Call UE Loader"](#) for more information.

Configuring Event Notification

Revenue Assurance Manager uses event notification to collect data on written-off EDRs and set up revenue assurance alerts. See ["About Using Event Notification to Generate Revenue Assurance Data"](#) for more information.

Before you can use Revenue Assurance Manager, you must configure the event notification feature as follows:

1. If your system has multiple configuration files for event notification, merge them.

See ["Merging Event Notification Lists"](#) in *BRM Developer's Guide* for more information.

2. Ensure that the merged file includes the entire event notification list in the `BRM_Home/sys/data/config/pin_notify_ra` file.

3. (Optional) If necessary to accommodate your business needs, add, modify, or delete entries in your final event notification list.

See ["Editing the Event Notification List"](#) in *BRM Developer's Guide* for more information.

4. (Optional) If necessary to accommodate your business needs, create custom opcodes for event notification to trigger.

See ["Triggering Custom Operations"](#) in *BRM Developer's Guide* for more information.

5. Load your final event notification list into the BRM database.

See ["Loading the Event Notification List"](#) in *BRM Developer's Guide* for more information.

Note: In addition, your business needs may require that you use event notification to call opcodes when other objects are created in the BRM database.

See ["Using Event Notification"](#) in *BRM Developer's Guide* for more information.

Selecting Aggregation Scenarios

Aggregation scenarios determine what revenue assurance data is collected from pipelines and how that data is grouped. See ["About Aggregation Scenarios"](#) for more information.

You may be able to use one or more of the preconfigured scenarios supplied with Revenue Assurance Manager. Each scenario groups data differently. See ["Using Revenue Assurance Aggregation Scenarios"](#) for detailed descriptions.

If none of the preconfigured aggregation scenarios satisfies your business requirements, you can create your own. For details, see ["Creating New Aggregation Scenarios for Revenue Assurance"](#) and Pricing Center Help on instructions for defining an aggregation scenario.

You must associate aggregation scenarios with control points in the registry of the FCT_Aggregate module. See ["Configuring the FCT_Aggregate Module to Collect Revenue Assurance Data"](#).

Loading Scenarios into the Pipeline Manager Database

You must load aggregation scenarios into the Pipeline Manager database before you can use them. Scenarios that you create are loaded into the database by Pricing Center at the time of creation.

To load scenarios into an Oracle Pipeline Manager database, run the following command against the Pipeline Manager database from the *Pipeline_Home/database/oracle/scripts* directory:

```
% sqlplus user/password@database RevenueAssurance_Scenarios.sql
```

where:

- *Pipeline_Home* is the directory in which you installed Pipeline Manager.
- *user* is the Pipeline Manager user ID.
- *password* is the Pipeline Manager user password.
- *database* is the Pipeline Manager database alias.

Identifying Control Point Locations for Revenue Assurance Data

You configure control points in pipeline locations where you want to collect revenue assurance data. You associate an aggregation scenario with the control point to determine the data that is collected. See ["About Control Points"](#) for more information.

The exact locations where you place control points depend on the data you are collecting. It is often useful to insert control points before and after a critical point in the pipeline. For example, you can insert a control point before and after rating so that you can analyze the impact on EDRs.

You place a control point in a pipeline by inserting an instance of the FCT_Aggregate module at the desired point in the pipeline. You specify the control point ID and aggregation scenario in the module registry. See ["Configuring the FCT_Aggregate Module to Collect Revenue Assurance Data"](#) for more information. Each control point ID must be unique system-wide.

Configuring the FCT_Aggregate Module to Collect Revenue Assurance Data

You insert the FCT_Aggregate module at locations that you identify to collect revenue assurance data. You define a control point and associated aggregation scenario in the registry of each FCT_Aggregate module that you insert.

Note: If an aggregation scenario requires one or more iScripts, you must specify them in the Function Pool section of the pipeline registry. See ["Using iScripts to Derive Grouping Fields"](#) for more information.

You also configure other options in the module registry, including details about control and result files. These are standard options unrelated to revenue assurance. See "Setting Up Pipeline Aggregation" in *BRM Configuring Pipeline Rating and Discounting* for more information.

To configure an FCT_AggreGate module for revenue assurance:

1. Add the FCT_AggreGate module to the pipeline registry at the desired location.
2. Configure the module for revenue assurance data:
 - In the Scenarios section of the registry, create a block for the scenario by entering the scenario name. For example, enter **RA_03** to use the Service Type scenario.
 - For the **ControlPointId** parameter, enter an ID for the control point you are defining. The control point ID must be unique and have maximum of 30 characters. For example, if you use the Service Type scenario, you might define the **CP_PostRatingBatchStat_Svctype** control point.
 - For the **TableName** registry entry, enter the name of the scenario that you defined earlier.

Note: The value of the **TableName** entry is used as the name of the output files for the scenario. Using the scenario name for this entry makes it easier to associate files with the scenarios from which they were created.

- Add the registry parameter **IncludeProcessingTimestamps** and set it to **TRUE**.
- Enter values for the standard FCT_AggreGate parameters, such as **Threshold**, **TempDir**, **DoneDir**, **CtlDir**. See "About Aggregation Scenarios" in *BRM Configuring Pipeline Rating and Discounting* for more information.
- Enter a semicolon (;) for the FieldDelimiter.
- Add the parameters **IncludeErrorEDRs** and **IncludeInvalidDetailEDRs** and set them to **TRUE**.

Note: When configuring scenarios that do not use grouping based on the field **EDRStatus**, do not specify the **IncludeErrorEDRs** and **IncludeInvalidDetailEDRs** parameters.

The following example shows FCT_AggreGate configured for control point **CP_PostRatingBatchStat_Svctype** using the Service Type aggregation scenario (**RA_03**):

```
# Aggregation
-----
# AggreGate
{
  ModuleName = FCT_AggreGate
  Module
  {
    Active = TRUE
    ScenarioReaderDataModule = ifw.DataPool.ScenarioReader
    Scenarios
    {
      RA_03
```

```

{
  TableName      = RA_03
  Threshold      = 10000
  TempDir        = ./data/aggregate
  DoneDir        = ./data/aggregate
  CtlDir         = ./data/aggregate
  FieldDelimiter = ;
  ControlPointId = CP_PostRatingBatchStat_Svctype
  IncludeErrorEDRs      = TRUE
  IncludeInvalidDetailedEDRs = TRUE
  IncludeProcessingTimestamps = TRUE

  ResultFile
  {
    IncludeFormat = FALSE
    TempSuffix    = .tmp
    DoneSuffix    = .dat
    WriteEmptyFile = FALSE
  }
  ControlFile
  {
    IncludeFormat = FALSE
    Suffix        = .ctl
    DataFilePath  = TRUE
  }
}

```

Using iScripts to Derive Grouping Fields

Review the description of the scenario you are using to see if it requires any iScripts. Scenarios use iScripts to derive grouping fields such as **EDR Status**, **Revenue Stream**, and **Output Stream**.

If required, you need to specify the iScripts in the FunctionPool section of the registry file, before the FCT_AggreGate module. See the description of FCT_IScript in *BRM Configuring Pipeline Rating and Discounting* for more information.

See the description of the following iScripts in *BRM Configuring Pipeline Rating and Discounting* for more information on where to enter these iScripts:

- ISC_SetEDRStatus
- ISC_SetOutputStream
- ISC_SetRevenueStream
- ISC_SetRevenueFigures

The following iScript must be placed at the beginning of the pipeline to ensure that the batch ID is inserted before any further processing of the mediation batches.

- ISC_SetAndValidateBatchInfo

Configuring SimpleSample Files

Configure the SimpleSample files to map the batchIDs of the EDRs. This is a mandatory step for Revenue Assurance Manager to work correctly.

You can find the SimpleSample files at: *Pipeline_Home/opt/ifw/formatDesc/Formats/Sample*.

To configure the SimpleSample files:

1. Open the **SIMPLESAMPLE_v1.dsc** file using a text editor such as Notepad.
2. Find the following line:

```
SERVICE                      AscString();
```

3. Add the following lines before the aforementioned line:

```
BATCH_ID                      AscString();  
ORIGINAL_BATCH_ID             AscString();  
SUSPENDED_FROM_BATCH_ID       AscString();  
EVENT_ID                      AscString();
```

4. Save and close the file.
5. Open the **SIMPLESAMPLE_v1_InMap.dsc** file using a text editor such as Notepad.
6. Find the following line:

```
"020"                        -> DETAIL.RECORD_TYPE;
```

7. Add the following lines before the aforementioned line:

```
BATCH_ID                      -> DETAIL.BATCH_ID;  
ORIGINAL_BATCH_ID             -> DETAIL.ORIGINAL_BATCH_ID;  
SUSPENDED_FROM_BATCH_ID       -> DETAIL.ASS_SUSPENSEEXT.SUSPENDED_FROM_BATCH_ID;  
EVENT_ID                      -> DETAIL.EVENT_ID;
```

8. Save and close the file.
9. Open the **SIMPLESAMPLE_v1_InGrammar.dsc** file using a text editor such as Notepad.
10. Find the following line:

```
edrInputMap( "SIMPLESAMPLE_V1.DETAIL.STD_MAPPING" );
```

11. Add the following lines before the aforementioned line:

```
edrAddDatablock( DETAIL.ASS_SUSPENSE_EXT );
```

12. Save and close the file.

Adding Control Points to Flows

Flows are ordered sets of related control points. You group control points into flows so that you can search for and view them conveniently in Revenue Assurance Center. When you view a flow in Revenue Assurance Center, its control points are displayed in the order in which they were defined.

You define flows in the **pin_config_ra_flows** file and load the flows into the database by using the **load_pin_config_ra_flows** utility. See "[load_pin_config_ra_flows](#)". Flows are stored as **/config/ra_flows** objects.

The **load_pin_config_ra_flows** utility overwrites existing flows. You must load a complete set of flows each time you run the utility.

To add control points into flows and load them into the database:

1. Open the **BRM_Home/sys/data/config/pin_config_ra_flows** file in a text editor.

This file includes instructions about the syntax to use to add control points to flows.

2. Save and close the file.
3. Use the following command to load your control points into the database:

```
% load_pin_config_ra_flows pin_config_ra_flows
```

If you do not run the utility from the directory in which the file is located, include the complete path to the file; for example:

```
% load_pin_config_ra_flows BRM_Home/sys/data/config/pin_config_ra_flows
```

Tip: If you copy the `pin_config_ra_flows` file to the directory from which you run the `load_pin_config_ra_flows` utility, you do not have to specify the path or file name. The file must be named `load_pin_config_ra_flows`.

To verify that the flows were loaded, you can display the `/config/ra_flows` object by using the Object Browser, or use the `robj` command with the `testnap` utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

Linking Rating, Rerating, and Write-Off Control Points

For Revenue Assurance Center to recognize original and current values for certain types of control points, you must link them and add the links to the BRM database. The control points that require linking include:

- Rating to rerating.
- Rerating to written-off.
- Rating to written-off.

To link control points, you define the links in the `pin_config_controlpoint_link` file and then load them into the BRM database by using the `load_pin_config_controlpoint_link` utility. See "[load_pin_config_controlpoint_link](#)". Links are stored in the `/config/link_controlpoint` object in the BRM database. The `PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK` opcode links `/process_audit/batchstat` objects based on the data in the `/config/link_controlpoint` object. See "[About the Revenue Assurance Manager Opcodes](#)" for more information.

Caution: The `load_pin_config_controlpoint_link` utility overwrites existing links. You must load a complete set of links each time you run the utility.

Important: The `load_pin_config_controlpoint_link` utility needs a configuration (`pin.conf`) file in the directory from which you run the utility. See "Creating Configuration Files for BRM utilities" in *BRM System Administrator's Guide* for more information.

To configure your control points into flows and load them into the database:

1. Open the `BRM_Home/sys/data/config/pin_config_controlpoint_link` file in a text editor. This file includes instructions on how to add control points into flows.
2. Save and close the file.

3. Use the following command to load your control points into the database:

```
% load_pin_config_controlpoint_link pin_config_controlpoint_link
```

If you do not run the utility from the directory in which the file is located, include the complete path to the file; for example:

```
% load_pin_config_controlpoint_link BRM_Home/sys/data/config/pin_config_controlpoint_link
```

Tip: If you copy the `pin_config_controlpoint_link` file to the directory from which you run the `load_pin_config_controlpoint_link` utility, you do not have to specify the path or file name. The file must be named `pin_config_controlpoint_link`.

See "[load_pin_config_controlpoint_link](#)" for more information.

To verify that the control point links were loaded, you can display the `/config/controlpoint_link` object by using Object Browser, or use the `robj` command with the `testnap` utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

Setting Up UE Loader to Load Revenue Assurance Data into the Database

UE Loader takes the revenue assurance data from the FCT_AggreGate output files and loads it into the BRM database. The following sections explain how to configure UE Loader.

Setting Up UE Loader Templates

UE Loader requires that each aggregation scenario have a separate UE Loader event input template in XML format to map the data generated by FCT_AggreGate to the input flist for the opcodes that data. Revenue Assurance Manager provides XML templates for each of the preconfigured scenarios.

See "About Rating Events Created by External Sources" in *BRM Setting Up Pricing and Rating* for more information about UE Loader.

Setting Up Batch Controller to Call UE Loader

Batch Controller runs programs such as UE Loader either when a specific event occurs or automatically at timed intervals. See "Controlling Batch Operations" in *BRM System Administrator's Guide* for instructions on how to configure Batch Controller to run UE Loader to load revenue assurance data into the database.

Most implementations use the occurrence-driven execution feature of Batch Controller to run UE Loader whenever FCT_AggreGate creates output files with revenue assurance data.

Important: If you set up Batch Controller to load scenario data files periodically rather than by occurrence, make sure the files are loaded frequently. Revenue Assurance Center uses the time when records were loaded into the database when it searches for data in time range. For the revenue assurance data to be meaningful, it should be loaded into the database soon after creation.

Setting Up Revenue Assurance Manager to Collect Data on Written-Off EDRs

For written-off EDRs, Revenue Assurance Manager collects the original batch ID and the number of EDRs that were written off in the batch. See "[About Collecting Revenue Assurance Data on Written-Off EDRs](#)" for more information.

To collect revenue assurance data on written-off EDRs, do the following:

- Enable event notification for Revenue Assurance Manager.
See "[Configuring Event Notification](#)" for more information.
- Set a parameter in the Connection Manager **pin.conf** file to configure the control point ID to collect the revenue assurance data on written-off EDRs. You can change this control point ID.

See "[Changing the Control Point for Data on Written-Off EDRs](#)" for more information.

Setting Up Revenue Assurance Manager for Billing

This chapter describes how to configure Oracle Communications Billing and Revenue Management (BRM) billing and invoicing to generate data for Revenue Assurance Manager.

Before reading this chapter, you should be familiar with the following:

- [About Collecting Revenue Assurance Data from Billing](#)
- "Running Billing Utilities" in *BRM Configuring and Running Billing*

Configuring BRM Billing to Collect Revenue Assurance Data

Note: To generate revenue assurance data, you must have Revenue Manager installed. See ["Installing Revenue Assurance Manager"](#) for instructions.

You need to complete the following tasks to configure BRM billing for Revenue Assurance Manager:

- [Enabling Billing Utilities to Generate Revenue Assurance Data](#)
- [Configuring Bill Now, On-Demand Billing, and Auto-Triggered Billing to Collect Revenue Assurance Data](#)

Enabling Billing Utilities to Generate Revenue Assurance Data

By default, billing utilities do not generate revenue assurance data. You enable the utilities to generate data by changing an entry in their configuration (**pin.conf**) files. You make the same change to three separate configuration files:

- *BRM_Home/apps/pin_bill/pin.conf*
- *BRM_Home/apps/pin_trial_bill/pin.conf*
- *BRM_Home/apps/pin_inv/pin.conf*

To enable revenue assurance data in billing utilities:

1. Using a text editor, open the utility configuration file.
2. Change **0** to **1** in the following entry:

```
- pin_mta enable_ara 0
```

A value of **1** generates revenue assurance data; **0** disables data generation.

3. Save and close the file.
4. Stop and start the Connection Manager (CM).

See the discussion of starting and stopping the BRM system in *BRM System Administrator's Guide*.

Configuring Bill Now, On-Demand Billing, and Auto-Triggered Billing to Collect Revenue Assurance Data

By default, collecting revenue assurance data for Bill Now, on-demand billing, and auto-triggered billing is disabled. You enable this feature by using the **pin_bus_params** utility to modify the **EnableARA** parameter in the **billing** instance of the **/config/business_params** object.

Complete these tasks to enable Bill Now, on-demand billing, and auto-triggered billing to generate revenue assurance data:

1. Run the following command to create an editable XML file from the **billing** instance of the **/config/business_params** object:

```
pin_bus_params -r bus_params_billing.xml
```

This command creates an XML file named **bus_params_billing.xml.out** in your working directory. (You can specify another location for this file if you want).

2. Using a text editor, open the new **bus_params_billing.xml** file.
3. Change **disabled** to **enabled** in this entry:

```
<EnableARA>disabled</EnableARA>
```

Caution: This file contains the instructions that BRM uses to overwrite the existing **/config/business_params** object. If you delete or modify other parameters in the file, you may cause unexpected behavior in the BRM A/R configuration.

4. Save and close the file.
5. Go to **BRM_Home/sys/data/config** and load the change into the **/config/business_params** object by using this command:

```
pin_bus_params bus_params_billing.xml
```

Tip: To execute this command from a different directory, see "pin_bus_params" in *BRM Developer's Guide*.

6. To verify that all fields are correct, read the object with the **testnap** utility or Object Browser.

Tip: See "Using testnap" and "Reading Objects by Using Object Browser" in *BRM Developer's Guide* for general instructions on using **testnap** and for information on how to use Object Browser.

7. Stop and restart the Connection Manager (CM).

For more information, see the discussion of starting and stopping the BRM system in *BRM System Administrator's Guide*.

8. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter.

For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

Configuring Item Subtypes

For bill items to work as configured in Revenue Assurance Manager, you must configure *item subtypes*. Item subtypes define the different types of charges for item types such as cycle arrears, cycle forward, cycle forward arrears, and so on. For example, cycle forward fee and cycle arrears fees can be categorized can be included in the **recurring** subtype and monthly usage in the **usage** subtype.

If you do not configure billable item subtypes, the split revenue assurance data is stored as miscellaneous charges.

You define item subtypes in the **config_item_types** file by using the **sub_type** property in the **ItemType** tag.

Before configuring item subtypes, you must first configure bill items. See "Creating Custom Bill Items" in *BRM Configuring and Running Billing*.

To configure item subtypes:

1. Using a text editor, open the **config_item_types** file in the *BRM_Home/sys/data/pricing/example* directory.
2. Define your new item subtypes in the **ItemType** tag.

Use the item subtypes **recurring** and **remit** default item subtypes as examples. You can copy and change it as necessary.

```
<ItemType precreate="false" type="cumulative" sub_type="recurring">/item/cycle_
forward_arrear</ItemType>
```

Important: Be sure to enter **Discount** for discount subtypes. Otherwise, Revenue Assurance Center will display the item's data on the Revenue sections instead of the Adjustments/Discounts section.

3. In the Storable Class Editor, create the storable class */item/name*, where *name* is the value in the PIN_FLD_TYPE field of */config/item_types*.
4. Run the **load_config_item_tags** and **load_config_item_types** utilities to configure the item subtypes in the BRM database. See "load_config_item_tags" and "load_config_item_types" in *BRM Configuring and Running Billing*.

The defined subtypes are displayed in Revenue Assurance Center in the **Charge Type** column of the Billing Details screen, under the **Revenue** section, except for subtypes that are defined as discount, which are displayed in the **Adjustments/Discounts** section of the Billing Details screen. For more information, see the Revenue Assurance Center Help.

Using Batch IDs in Revenue Assurance Manager

This chapter describes how to use batch IDs are used in Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager.

Before reading this chapter, you should:

- Follow the instructions in ["Setting Up Revenue Assurance Manager for Pipeline Batch Rating"](#) to configure Revenue Assurance Manager.
- Follow the instructions in ["About Installing Revenue Assurance Center"](#) and ["Customizing Revenue Assurance Center"](#) to install and configure Revenue Assurance Center.

You should also be familiar with the following:

- [Understanding Revenue Assurance Manager](#)
- "About pipeline rating" in *BRM Configuring Pipeline Rating and Discounting*

Tracking EDRs by Using Batch IDs

In pipeline batch rating, each batch file received from the mediation system is assigned a batch ID, which is stored in every EDR derived from the file. Each EDR also receives a unique event ID.

Note: The **KeepExistingBatchIds** registry entry in FCT_PreSuspend module controls the way batch IDs are set. For details, see ["Setting the Default Batch ID Behavior"](#).

During rerating and recycling, the EDR receives a new batch ID, but the original batch ID is retained in a different field. Retaining the original batch ID in the EDR makes it possible to determine the revenue impact of EDRs for each batch that is received from mediation, even if some EDRs are rerated or recycled.

Revenue Assurance Manager uses the following fields to track EDRs as they are processed by pipelines and as they are rerated or recycled:

- `DETAIL.BATCH_ID`
- `DETAIL.ORIGINAL_BATCH_ID`
- `DETAIL.ASS_SUSPENSE_EXT.SUSPENDED_FROM_BATCH_ID`

For example, BRM receives a batch file with batch ID **Mediation087**. All EDRs for events in the file are assigned this batch ID. The batch rating pipeline processes EDRs from this batch loads their data into the BRM database.

Later, some of the EDRs from this batch and a second batch, **Mediation099**, are rerated. During rerating, the two sets of EDRs from different batches are given the new batch ID **ReratingBatch007**. When the individual EDRs are given the new batch ID, their original batch IDs are moved to the `ORIGINAL_BATCH_ID` field.

[Table 5–1](#) contains selected data from an EDR in the batch after rating:

Table 5–1 Rating EDR Data

Event ID	Duration	Charge	Batch ID	Original Batch ID
189	180	3	Mediation087	Mediation087

[Table 5–2](#) contains the data for the EDR after rerating:

Table 5–2 Rerating EDR Data

Event ID	Duration	Charge	Batch ID	Original Batch ID
189	180	5	ReratingBatch007	Mediation087

Keeping Track of Rejected EDRs by Using Batch IDs

When a batch file is processed, some of its EDRs may not be able to be rated because of missing data or another reason. These rejected EDRs can be processed by Suspense Manager and recycled back into the rating pipeline. EDRs that are being rerated can also be rejected and sent to recycling.

When Suspense Manager recycles the rerated EDRs back through the pipeline, they receive new batch IDs based on the recycling batch. Their original batch IDs remain to reflect the mediation batch they started in. The suspended-from batch ID field (`DETAIL.ASS_SUSPENSE_EXT.SUSPENDED_FROM_BATCH_ID`) stores the ID of the batch in which the EDR was rejected. This could be the original batch or a rerating batch.

For example, two batches (MED1 and MED2) are received from the mediation system and processed by the batch rating pipeline. Some EDRs from each of the two batches are rejected and then recycled as part of batch RCL1. In addition, some EDRs from the original two batches are rerated as part of batch RRT1. Some of the EDRs in that rerating batch are rejected and then recycled as part of batch RCL2.

[Table 5–3](#) summarizes how the three different batch ID fields change as EDRs are rated, rerated, and recycled.

Table 5–3 Batch ID Changed Fields

Pipeline Process	Value for BATCH_ID	Value for ORIGINAL_BATCH_ID	Value for SUSPENDED_FROM_BATCH_ID
Rating Batch MED1	MED1	MED1	MED1* ¹
Rating Batch MED2	MED2	MED2	MED2* ¹

Table 5–3 (Cont.) Batch ID Changed Fields

Pipeline Process	Value for BATCH_ID	Value for ORIGINAL_BATCH_ID	Value for SUSPENDED_FROM_BATCH_ID
Recycle Batch RCL1 (containing suspended EDRs from MED1 and MED2)	RCL1	MED1/MED2	MED1/MED2
Rerating Batch RRT1 (containing EDRs from MED1 and MED2)	RRT1	MED1/MED2	RRT1* ¹
Recycle Batch RCL2 (containing suspended EDRs from RRT1)	RCL2	MED1/MED2	RRT1

¹ The value of the suspended-from batch ID is ignored in rating and rerating. Because it is left blank, it is assigned the value of batch ID.

By linking the control point in the original mediation pipeline to the control point in the recycle pipeline that processed the rerated EDRs, you can determine the revenue impact for each of the mediation batches and identify the revenue leakage in your system.

Setting the Default Batch ID Behavior

The **KeepExistingBatchIds** registry entry in FCT_PreSuspense module controls whether the values for batch IDs in EDR records are preserved as originally set by the input module.

- A value of **True** preserves the batch ID in each detail record of the batch input file.
- A value of **False** (the default) sets the batch ID of each record to the batch ID contained in the header record of the batch input file.

Configuring Revenue Assurance Alerts

This chapter describes how to configure alerts based on revenue assurance data collected in your Oracle Communications Billing and Revenue Management (BRM) system.

Before reading this chapter, read the following documents:

- [Understanding Revenue Assurance Manager](#)
- [Installing Revenue Assurance Manager](#)
- [Setting Up Revenue Assurance Manager for Pipeline Batch Rating](#)

About Revenue Assurance Alerts

You can configure Revenue Assurance Manager to send alerts when the data collected meets criteria that you specify. For example, you can configure an alert to be sent when the number of EDRs rejected in one day exceeds a value that you specify.

Configuring and using revenue assurance alerts involves:

- Configuring alert thresholds in the **pin_config_ra_thresholds** file and loading them into **/config/ra_thresholds** objects.
See ["Configuring Alert Thresholds"](#) for more information.
- Configuring email alerts by:
 - Creating the text of the email alerts in the **ra_alert_message.locale** file and loading it into **/strings** objects. See ["Specifying Email Alert Text"](#) for more information.
 - Defining email details, such as recipient information, in the **pin_config_ra_alerts** file and loading it into **/config/ra_alerts** objects. See ["Specifying Email Alert Details"](#) for more information.
- Checking for alerts periodically by using the **pin_ra_check_thresholds** utility. See ["pin_ra_check_thresholds"](#).

See ["Generating Revenue Assurance Alerts"](#) for more information.

Alerts also require that event notification be configured. See ["Configuring Event Notification"](#) for more information.

You can customize the default alert behavior by changing the **PCM_OP_PROCESS_AUDIT_POL_ALERT** opcode. For example, you could customize the opcode to log alert information in addition to sending emails. For details, see ["Customizing Alert Behavior"](#) for more information.

Configuring Alert Thresholds

You configure alert thresholds in the **pin_config_ra_thresholds** file. When you configure an alert threshold, you define:

- The data you want to check and the time period in which it will be checked.
See ["Defining Threshold Data and Time Periods"](#) for more information.
- Optional filter criteria to narrow results.
See ["Defining Filter Conditions"](#) for more information.
- Minimum and maximum threshold values for the data you specify.
See ["Defining Field Value Ranges"](#) for more information.

The values you specify work together to determine whether an alert is triggered. All conditions must be met for an alert to be triggered.

The **pin_config_ra_thresholds** file includes syntax information and examples. Consult the file for more information. Use this section to supplement the information in the file.

After your alert thresholds are defined in **pin_config_ra_thresholds**, you load that information into the database's **/config/ra_thresholds** objects. See ["Loading Alert Details into the Database"](#) for more information.

Defining Threshold Data and Time Periods

You define an alert threshold's data and time periods in a line with the following syntax:

```
RA_Threshold:
<Threshold Name> <Obj Type> <Date Range Type> <WeekDay> <Number of Units> <Start
Offset>
<Length of Period> <Secs/Mins/Hrs>
```

For example:

```
RA_Threshold:
Rejected_EDRs_Per_Day /process_audit/batchstat/status 1 1 1 16:00:00 0 Secs
```

[Table 6–1](#) describes the threshold parameters.

Table 6–1 Threshold Parameters

Parameter	Description
Threshold Name	Defines the threshold name that is used when the alert is issued. The name should be as descriptive as possible. For example, Duplicate_SMS_EDRs_Per_Week is a good name for a weekly alert for the number of duplicate SMS EDRs.
Obj Type	Specifies the /process_audit subclass that contains the threshold value to be checked. For example, to generate alerts when the number of rejected EDRs reaches a certain value, enter /process_audit/batchstat/status .
Date Range Type	Determines the time range covered by the alert. There are three options: <ul style="list-style-type: none"> Enter 0 to specify an alert configured for a specific time period. For example, you can configure a period alert to check data between 8:00 a.m. and 5:00 p.m. The time period is based on the process end time (PIN_FLD_PROCESS_END_T in the /process_audit object). Period alerts require a value for the Length of Period parameter. Enter 1 to specify a daily alert configured to repeat on a 24-hour basis. For example, you can configure a daily alert to check data every day from 4:00 p.m. on the current day to 4:00 p.m. the next day. Enter 2 to specify an alert configured to run for an entire week. For example, you can configure a weekly alert to check data from 8:00 a.m. Monday to 8:00 a.m. the following Monday.
WeekDay	Indicates the day of the week on which a period or weekly alert is processed. Each day is represented by a numerical value between 1 (Sunday) and 7 (Saturday). Note: This entry is not valid for daily alerts; set the value to 0 .
Number of Units	Indicates how many days or weeks a daily or weekly alert will be processed. For example, if a daily alert needs to be processed for five days, enter 5 . Note: This entry is not applicable to period alerts. Set the value to 0 if you are configuring a period alert.
Start Offset	Specifies the time of day at which the alert starts. This value should be specified the start time in hours, minutes, and seconds, expressed in 24-hour format. For example, to start an alert at 4:00 p.m., you must specify the start offset time as 16:00:00 .
Length of Period	Specifies the duration of period alerts, expressed in seconds, minutes, or hours (depending on the value specified in the Secs/Mins/Hrs parameter). The duration must be less than or equal to one week. Note: This parameter is applicable only to period alerts. For other alert types, set to 0 .
Secs/Mins/Hrs	Specifies the time unit that applies to the Length of Period parameter - seconds (Secs), minutes (Mins), or hours (Hrs). This value is ignored for daily and weekly alerts.

Defining Filter Conditions

You set filter conditions by specifying required values for a field or fields in the **/process_audit** objects defined for the threshold. For example, if the threshold is checking **/process_audit/batchstat/status** objects, you could specify that the value of the PIN_FLD_EDR_STATUS field must be REJECTED.

You can enter more than one filter for a threshold. Data must meet all filter conditions.

You define filter conditions with the following syntax:

```
RA_Filter:
<Filter Field Name> <Filter Int Value> <Filter String Value>
<Filter Field Name> <Filter Int Value> <Filter String Value>
```

For example:

```
RA_Filter:
```

```
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_STATUS 0 REJECTED
PIN_FLD_GROUP_DETAILS.PIN_FLD_SVC_TYPE 0 SMS
```

Defining Field Value Ranges

You define threshold values in alerts so that when the thresholds are reached or crossed, the alert generates notifications. You set threshold values by specifying a minimum and maximum value for a field in the **/process_audit** objects defined for the threshold. For the threshold to be reached, the value of the field must be less than or equal to the minimum value *or* greater than or equal to the maximum value.

For example, if the threshold applies to **/process_audit/batchstat/status** objects, you could specify 0 and 75 as the minimum and maximum value for the PIN_FLD_EDR_COUNT field.

You can define multiple field value ranges for the same field. This allows you to send a new alert when the field value reaches a new threshold. For example, you could define an additional field value range for the PIN_FLD_EDR_COUNT field with a maximum of 150. This would trigger an alert if the value continues to rise after the initial alert at 75.

You define the field value range with the following syntax:

```
RA_Field_Value_Range:
<Field Name> <Max_Field_Value> <Min_Field_Value>
<Field Name> <Max_Field_Value> <Min_Field_Value>
```

For example:

```
RA_Field_Value_Range:
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 50 0
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 150 0
```

Period Alert Example

This period alert runs from 8 a.m. to 5 p.m. every Friday, and is triggered when the number of rejected EDRs exceeds 75 for that period:

```
RA_Threshold:
Rejected_EDRs_Per_Day /process_audit/batchstat/status 0 6 0 08:00:00 9 Hrs

RA_Filter:
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_STATUS 0 REJECTED

RA_Field_Value_Range:
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 75 0
```

Daily Alert Example

This alert runs daily starting at 4:00 p.m. It is triggered when the number of rejected EDRs reaches 1000 for the day. The alert is scheduled to repeat for 90 days.

```
RA_Threshold:
Rejected_EDRs_Per_Day /process_
audit/batchstat/status 1 0 90 16:00:00 0 Secs

RA_Filter:
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_STATUS 0 REJECTED

RA_Field_Value_Range:
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 1000 0
```

Weekly Alert Example

This alert runs weekly starting at 8:00 a.m. on Monday. It is triggered when the number of rejected SMS EDRs reaches 100 during that period and again when the number reaches 250. It will be valid for an entire year (52 weeks).

RA_Threshold:

```
Reject_SMS_EDRs_Week /process_audit/batchstat/svctype_
revstream 2 2 52 08:00:00 0 Secs
```

RA Filter:

```
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_STATUS 0 REJECTED
PIN_FLD_GROUP_DETAILS.PIN_FLD_SVC_TYPE 0 SMS
```

RA_Field_Value_Range:

```
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 100 0
PIN_FLD_GROUP_DETAILS.PIN_FLD_EDR_COUNT 250 0
```

Loading Alert Details into the Database

After you have configured alert details, you use the **load_pin_config_ra_thresholds** utility to load them into the **/config/ra_thresholds** object. See "[load_pin_config_ra_thresholds](#)". The **pin_ra_check_thresholds** utility then uses the threshold information in the **/config/ra_thresholds** object to search revenue assurance data when it generates alerts. See "[pin_ra_check_thresholds](#)".

Loading Alert Details by Using **load_pin_config_ra_thresholds**

To load your threshold values into the BRM database:

Important: The **load_pin_config_ra_thresholds** utility needs a configuration (**pin.conf**) file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information. If the utility fails, it does not overwrite the existing data.

1. Open the **BRM_Home/sys/data/config/pin_config_ra_thresholds** file in a text editor.
2. Use the instructions and examples in **pin_config_ra_thresholds** to configure alert details.
3. Save and close the file.
4. Load the alert details into the database by using this command:

```
load_pin_config_ra_thresholds pin_config_ra_thresholds
```

If you do not run the utility from the directory in which the file is located, include the complete path to the file; for example:

```
load_pin_config_ra_thresholds BRM_Home/sys/data/config/pin_config_ra_thresholds
```

Tip: If you copy the **pin_config_ra_thresholds** file to the directory from which you run the **load_pin_config_ra_thresholds** utility, you do not have to specify the path or file name. The file must be named **pin_config_ra_thresholds**.

See ["load_pin_config_ra_thresholds"](#) for more information.

To verify that the alert details were loaded, display the `/config/ra_thresholds` object by using Object Browser, or use the `robj` command with the `testnap` utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

Configuring Email Alerts

Configuring email alerts involves these tasks:

- Specifying the text you want in alert emails and optionally localizing that text.

See ["Specifying Email Alert Text"](#) for more information.

- Specifying email details and loading them into the database.

See ["Specifying Email Alert Details"](#) for more information.

Specifying Email Alert Text

You configure the subject and message body of email alert messages in the locale of your choice. To configure email alert messages in U.S. English, edit the `BRM_Home/sys/msgs/revenueassurance/ra_alert_message.en_US` file. This file includes a default subject line and message body that you can edit. The file also includes information about syntax and required elements, which follow standard rules for localized string files. See "Localizing and Customizing Strings" in *BRM Developer's Guide* for more information.

You can use substitution parameters in the file that are replaced with appropriate information when the alert email is sent. These are the substitution parameters you can use:

- `%ALERT_NAME`: Replaced with the alert name.
- `%START_TIME`: Replaced with the start time of the period for which alert was generated.
- `%END_TIME`: Replaced with end time of the period for which alert was generated.
- `%OBJECT_TYPE`: Replaced with object type value configured for the alert.
- `%FILTERS`: replaced with the field-value pairs of the filter conditions defined for the alert.
- `%THRESHOLD_VALUES`: Replaced with the field and corresponding minimum and maximum limits defined for the alert.
- `%LINE_BREAK`: Replaced with new line. (Applicable to the message body only.)

The default subject line is:

```
Alert %ALERT_NAME has crossed defined threshold values.
```

The default message body defined in the file is:

```
The alert %ALERT_NAME has crossed defined threshold values for the period %START_
TIME to %END_TIME. %LINE_BREAK The alert is configured as given below: %LINE_BREAK
ObjectType = %OBJECT_TYPE %LINE_BREAK Filter = %FILTERS %LINE_BREAK Threshold
Values = %THRESHOLD_VALUES"
```


You can define localized versions of the email alert text by creating **ra_alert_message.locale** files with the appropriate file name extension for the locales. See "Creating New Strings and Customizing Existing Strings" in *BRM Developer's Guide* for more information.

After defining the email text, you use the **load_localized_strings** utility to load the contents of the file into the **/strings** objects.

The load command syntax is as follows:

```
load_localized_strings ra_alert_message.locale
```

See "load_localized_strings" in *BRM Developer's Guide* for more information.

Note: When loading a localized version of this file, be sure to use the correct file extension for your locale. See "Locale Names" in *BRM Developer's Guide* for a list of file extensions.

See "Loading Localized or Customized Strings" in *BRM Developer's Guide* for more information.

Specifying Email Alert Details

You specify recipients and other details about email alerts in the **pin_config_ra_alerts** file. You specify these details for each alert:

- Name of the alert
- Locale to be used for subject and email body.

The locale determines which localized version of the alert text is sent.

- Name of the sender
- Email addresses of recipients

You define the sender name and locale for each alert in a single line with this syntax:

```
RA_Alert: Alert_Name Sender_Name Locale
```

Note: Each entry must begin with **RA_Alert**; the text is case-sensitive.

The **Alert_Name** parameter must be the name of an alert as defined in the **pin_config_ra_thresholds** file. The sender name is the name you want to appear in the **From** line of emails.

You define recipients for each alert by specifying email addresses and types in a block below the **RA_Alert** line. Use this syntax:

```
Email_addr_1 Email_Type>
Email_addr_2 Email_Type>
Email_addr_3 Email_Type>
```

The email type is optional. It determines how the email is sent to the recipient. Valid values are:

- 1 - Email is addressed directly to the recipient.
- 2 - The recipient receives a copy (CC).
- 3 - The recipient receives a blind copy and does not see other recipients (BCC).

- 4 - Specifies that the address is to be used as the Reply To value in the alert message.

This address is not a recipient of the alert email.

The default value is **1**, which is used if no type is specified.

The following example configures email notification for the Rejected_EDRs_Per_Day alert. The sender of alert emails is RA_NOTIFICATION. The primary recipient is RA_admin@mailserver.com and RA_operator@mailserver.com receives a copy.

```
RA_Alert: Rejected_EDRs_Per_Day RA_NOTIFICATION en_US
```

```
RA_admin@mailserver.com 1
RA_operator@mailserver.com 2
```

For additional information see, the *BRM_Home/sys/data/config/pin_config_ra_alerts* file, which includes syntax information and examples.

After configuring alert details, you load the file into the database by using the **load_pin_config_ra_alerts** utility. See "[load_pin_config_ra_alerts](#)". Email alert data is stored in the */config/ra_alerts* object.

Important: The **load_pin_config_ra_alerts** utility needs a configuration (**pin.conf**) file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information. If the utility fails, it does not overwrite the existing data.

To configure and load email details:

1. Open the *BRM_Home/sys/data/config/pin_config_ra_alerts* file in a text editor.
2. Add your email details to the file. The file includes instructions and sample data.
3. Save and close the file.
4. Load the email details into the database by using this command:

```
load_pin_config_ra_alerts pin_config_ra_alerts
```

If you do not run the utility from the directory in which the file is located, include the complete path to the file; for example:

```
load_pin_config_ra_alerts BRM_Home/sys/data/config/pin_config_ra_alerts
```

Tip: If you copy the **pin_config_ra_alerts** file to the directory from which you run the **load_pin_config_ra_alerts** utility, you do not have to specify the path or file name. The file must be named **pin_config_ra_alerts**.

See "[load_pin_config_ra_alerts](#)" for more information.

To verify that the email details were loaded, you can display the */config/ra_alerts* object by using Object Browser, or use the **robj** command with the **testnap** utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

Generating Revenue Assurance Alerts

You use the **pin_ra_check_thresholds** utility to check alert thresholds periodically. See "[pin_ra_check_thresholds](#)". You can run **pin_ra_check_thresholds** as part of a **chron**, **chrontab**, or **at** script, or you can run it manually.

This utility checks the **/config/ra_thresholds** object for the revenue assurance thresholds you have set. If it finds that a threshold has been crossed, it generates a notification event that causes the PCM_OP_PROCESS_AUDIT_POL_ALERT policy opcode to prepare and send an email. You can customize the opcode to change the default alert behavior. See "[Customizing Alert Behavior](#)" for more information.

Important: The **pin_ra_check_thresholds** utility needs a configuration (**pin.conf**) file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Use this command to run the **pin_ra_check_thresholds** utility:

```
pin_ra_check_thresholds
```

See "[pin_ra_check_thresholds](#)" for more information.

Using Revenue Assurance Aggregation Scenarios

This chapter describes the aggregation scenarios provided to collect revenue assurance data from Oracle Communications Billing and Revenue Management (BRM) pipeline batch rating.

Before you read this chapter, you should be familiar with these concepts:

- Pipeline batch rating and aggregation scenarios. See "About Pipeline Rating" in *BRM Configuring Pipeline Rating and Discounting* and the discussion of aggregation scenarios in the Pricing Center Help for more information.
- How Revenue Assurance Manager uses control points and aggregation scenarios. See "[About Control Points](#)" and "[About Aggregation Scenarios](#)" for more information.

About Aggregation Scenarios

Aggregation scenarios specify the data that is collected by Revenue Assurance Manager from pipeline batch rating. You must specify an aggregation scenario at every control point you set up in the pipeline.

Revenue Assurance Manager includes scenarios that are suitable for use in a production system. These scenarios group revenue assurance data in different ways. See "[Data Fields Collected by All Scenarios](#)" for a list of the fields from which the scenarios collect data. See "[Fields Used to Group Scenario Data](#)" for a list of the fields by which the scenarios can group data.

For example, the EDR statistics for scenario **RA_03** are grouped by service type, such as TEL, SMS, or GPRS. Data, such as event count, retail charged amount, and so on, is aggregated for each service type.

Most of the scenarios group by combinations of grouping fields. For example, scenario **RA_04** groups fields by both service type (TEL, SMS, and so on) and EDR status (duplicate, rejected, written-off or successful). Data is aggregated separately for each combination; duplicate EDRs for the SMS service, for example.

If the preconfigured scenarios do not meet your business needs, you can also create your own. For details, see "[Creating New Aggregation Scenarios for Revenue Assurance](#)" and instructions for defining aggregation scenarios in Pricing Center Help.

Note: Custom scenarios require custom UEL templates and cannot be used with Revenue Assurance Center.

Before you can use the preconfigured scenarios, you must load them into the pipeline database. See ["Loading Scenarios into the Pipeline Manager Database"](#) for instructions.

Data Fields Collected by All Scenarios

All of the preconfigured aggregation scenarios collect statistics from the EDR fields listed in [Table 7-1](#):

Table 7-1 All Scenarios Data Fields

Field	Description
Event count	Number of EDRs.
Retail charged amount	Retail charged amount collected.
Event wholesale value	Total wholesale amount charged for the EDR, if appropriate.
Discount amount	Discount amount applied.
Duration	Total usage time, in seconds, if appropriate (for example, for a voice call).
Volume sent	Data transferred in bytes, if appropriate (for example, for a GPRS event).
Volume received	Data received in bytes, if appropriate (for example, for a GPRS event).
Earliest call made	The earliest call start timestamp.
Latest call made	The latest call start timestamp.

Fields Used to Group Scenario Data

The EDR data fields in [Table 7-2](#) are available to use for grouping data.

Table 7-2 Grouping Data Fields

Grouping Field	Description
Batch ID	Batch ID of the batch being processed.
Original batch ID	Mediation batch ID of the rerating or recycling EDR batches.
Suspended from batch ID	The batch ID from which the EDR was suspended.
Service type	Type of service, such as TEL, SMS, or GPRS.
Revenue stream	Retail, Wholesale, or Roaming.
Output stream	The output stream of the EDR. This is based on the service type; for example, if the service type is SMS, the output stream is SMS.
EDR status	Success, Suspense, Duplicate, Discard, Rejected, or Skipped.
Suspense code	Suspense reason code assigned to the EDR.

Preconfigured Aggregation Scenario Details

[Table 7-3](#) provides information about the Revenue Assurance Manager preconfigured aggregation scenarios.

Table 7–3 RA Manager Preconfigured Aggregation Scenarios

Scenario/File Name	Collects Data for an EDR Batch Based On	Grouping Fields (Listed in the Grouping Order)	Storable Class	Installation Point	iScripts Required
RA_01, Batchstat_simple	An EDR batch.	Batch ID, Original batch ID, Suspended from batch ID	/process_audit/batchstat/simple	Anywhere in a pipeline	None
RA_02, BatchStat_status	EDR Status.	Batch ID, Original batch ID, Suspended from batch ID, EDR status	/process_audit/batchstat/status	Anywhere in a pipeline	ISC_SetEDRStatus
RA_03, BatchStat_SvcType	Service type.	Batch ID, Original batch ID, Suspended from batch ID, Service type	/process_audit/batchstat/svctype	After FCT_ServiceCodeMap	None
RA_04, BatchStat_SvcTypeStatus	Service type and EDR status. Using this scenario, you can find the number of records that are duplicate, rejected, or successful for each service type.	Batch ID, Original batch ID, Suspended from batch ID, Service type, EDR status	/process_audit/batchstat/svctype_status	After FCT_ServicecodeMap	ISC_SetEDRStatus
RA_05, BatchStat_RevenueStream	Revenue stream. The revenue streams are: Retail, Wholesale, and Roaming.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream	/process_audit/batchstat/revstream	After Post Rating	ISC_SetRevenueStream
RA_06, BatchStat_RevenueStream_Status	Revenue stream and EDR status.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream, EDR status	/process_audit/batchstat/revstream_status	After Post Rating	ISC_SetRevenueStream, ISC_SetEDRStatus
RA_07, BatchStat_RevenueStream_SvcType	Revenue stream and service type.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream, Service type	/process_audit/batchstat/revstream_svctype	After Post Rating	ISC_SetRevenueStream
RA_08, BatchStat_RevenueStream_ServiceType_Status	Revenue stream, service type, and EDR status.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream, Service type, EDR status	/process_audit/batchstat/revstream_svctype_status	After Post Rating	ISC_SetRevenueStream, ISC_SetEDRStatus
RA_09, BatchStat_SvcType_RevenueStream	Service type and the revenue stream.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream, Service type	/process_audit/batchstat/revstream_status_svctype	After Post Rating	ISC_SetRevenueStream
RA_10, BatchStat_ServiceType_RevenueStream_Status	Service type, revenue stream, and EDR status.	Batch ID, Original batch ID, Suspended from batch ID, Revenue stream, Service type, EDR status	/process_audit/batchstat/svctype_revstream_status	After Post Rating	ISC_SetRevenueStream, ISC_SetEDRStatus

Table 7–3 (Cont.) RA Manager Preconfigured Aggregation Scenarios

Scenario/ File Name	Collects Data for an EDR Batch Based On	Grouping Fields (Listed in the Grouping Order)	Storable Class	Installation Point	iScripts Required
RA_11, BatchStat_ Outputstream	Output stream.	Batch ID, Original batch ID, Suspended from batch ID, Output stream	/process_audit/batchstat/outputstream	Just before output	ISC_SetOutputStream
RA_12, BatchStat_ServiceType_RevenueStream_ Outputstream	Service type, revenue stream, and output stream.	Batch ID, Original batch ID, Suspended from batch ID, Output stream, Service type, Revenue stream	/process_audit/batchstat/svctype_revstream_outputstream	Just before output	ISC_SetRevenueStream and ISC_SetOutputStream
RA_13, BatchStat_Suspense	Suspense reason code.	Batch ID, Original batch ID, Suspended from batch ID, Suspense code	/process_audit/batchstat/suspense	After FCT_Suspense	None
RA_14, BatchStat_ServiceType_RevenueStream_Status_ Outputstream	Service type, revenue stream, EDR status, and output stream.	Batch ID, Original batch ID, Suspended from batch ID, Service type, Revenue stream, EDR status, Output stream	/process_audit/batchstat/svctype_revstream_status_outputstream	Just before output	ISC_SetRevenueStream, ISC_SetOutputStream, and ISC_SetEDRStatus

Customizing Revenue Assurance Manager

This chapter describes how to customize Oracle Communications Billing and Revenue Management (BRM) Revenue Assurance Manager.

See "[Understanding Revenue Assurance Manager](#)" for general information about Revenue Assurance Manager and its capabilities.

To customize Revenue Assurance Manager, you should have knowledge of the Pipeline Manager system architecture, BRM system architecture, PCM opcodes, flists, storable classes, aggregation scenarios, iScripts, and iRules. For more information, see:

- *BRM Concepts*
- *BRM System Administrator's Guide*
- *BRM Developer's Guide*

About the Revenue Assurance Manager Opcodes

Revenue Assurance Manager uses these Process Audit FM standard opcodes:

- **PCM_OP_PROCESS_AUDIT_CREATE**

This opcode creates audit objects for revenue assurance. It is called by PCM_OP_BILL_MAKE_BILL_NOW and PCM_OP_BILL_MAKE_BILL_ON_DEMAND and the UE Loader.

This opcode performs the following actions:

- Reads the primary database ID for storing **/process_audit** objects.
- Calls the PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK opcode to create **/process_audit/batchstat** objects.
- Calls the PCM_OP_PROCESS_AUDIT_POL_CREATE policy opcode to validate data and check for duplicate objects.
- Calls PCM_OP_CREATE_OBJ to create audit objects.

- **PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK**

This opcode creates **/process_audit/batchstat** objects and links them together.

This opcode performs the following actions:

- Calls the PCM_OP_PROCESS_AUDIT_POL_CREATE_AND_LINK policy opcode to check for duplicate objects and entries.
- Calls the PCM_OP_PROCESS_AUDIT_LINK opcode to create the necessary links between **/process_audit/batchstat** objects.

- **PCM_OP_PROCESS_AUDIT_LINK**
This opcode links **/process_audit/batchstat** objects according to the configuration specified in the **/config/link_controlpoint** object.
- **PCM_OP_PROCESS_AUDIT_CREATE_WRITEOFF_SUMMARY**
This opcode creates a summary of a write-off operation. It is triggered by a notification event generated by Suspense Manager when a suspended EDRs are written off. This opcode gets information about the written-off EDRs from the notification event, including the EDR's suspended batch ID and its original batch ID.
- **PCM_OP_PROCESS_AUDIT_SEARCH**
This opcode searches for and returns revenue assurance data from groups of **/process_audit/batchstat** objects.
You pass in:
 - A **/process_audit/batchstat** object subclass type.
 - A control point name.
 - The detailed grouping or summary data you want.
 - The type of search to perform.
 The opcode returns the relevant statistics.

Using Policy Opcodes to Customize Revenue Assurance Manager

You can use the following policy opcodes to customize Revenue Assurance Manager:

- **PCM_OP_PROCESS_AUDIT_POL_CREATE**
See ["Customizing Audit Object Validation"](#) for more information.
- **PCM_OP_PROCESS_AUDIT_POL_CREATE_AND_LINK**
See ["Customizing /process_audit/batchstat Object Validation"](#) for more information.
- **PCM_OP_PROCESS_AUDIT_POL_ALERT**
See ["Customizing Alert Behavior"](#) for more information.
- **PCM_OP_PROCESS_AUDIT_POL_CREATE_WRITEOFF_SUMMARY**
See ["Customizing the Revenue Assurance Written-Off EDR Summaries"](#) for more information.

Customizing Audit Object Validation

The **PCM_OP_PROCESS_AUDIT_POL_CREATE** policy opcode checks for duplication of audit objects and validates audit data. It is called by the **PCM_OP_PROCESS_AUDIT_CREATE** opcode.

This policy opcode performs the following actions:

- Checks for duplicate objects and validates data.
- Performs validation only if there are no duplicate audit objects.

The opcode returns any validated data and duplicate records.

You can customize PCM_OP_PROCESS_AUDIT_POL_CREATE by modifying the fields in the flist, modifying duplicate checks, and adding validation checks.

Customizing /process_audit/batchstat Object Validation

To validate **/process_audit/batchstat** objects, use the PCM_OP_PROCESS_AUDIT_POL_CREATE_AND_LINK policy opcode.

This opcode checks for duplication of audit objects and entries. It is called by PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK.

You can customize this opcode by modifying the fields in the flist, modifying duplicate checks, and adding validation checks.

This opcode sets and returns errors if there are any duplicate objects or entries, otherwise it returns the POIDs of the **/process_audit/batchstat** objects.

Customizing Alert Behavior

Revenue Assurance Manager uses the PCM_OP_PROCESS_AUDIT_POL_ALERT policy opcode to send email alerts when configured threshold values are crossed. See ["Configuring Email Alerts"](#) for information on configuring email alerts.

PCM_OP_PROCESS_AUDIT_POL_ALERT reads the details of the alert from the notification event and sends an alert email message using the details in the **/config/ra_alerts** object. These details include the recipient e-mail addresses, the locale to be used for subject, and the message body text.

PCM_OP_PROCESS_AUDIT_POL_ALERT calls the PCM_OP_DELIVERY_MAIL_SENDMSG opcode to send email messages using **dm_email**.

You can customize this opcode to notify an external system or change email. For example, you may want to send alerts via text messages or collect alert information in error logs in addition to sending emails.

Customizing the Revenue Assurance Written-Off EDR Summaries

After Suspense Manager writes off an EDR, Revenue Assurance Manager creates a summary of the EDR by calling the PCM_OP_PROCESS_AUDIT_POL_CREATE_WRITEOFF_SUMMARY policy opcode. You can change this process by adding custom code to this opcode.

By default, PCM_OP_PROCESS_AUDIT_POL_PREPARE_WRITEOFF_SUMMARY reads fields from **/suspended_usage/telco** object and maps them to fields in the **/process_audit/batchstat/status** object. [Table 8–1](#) below shows the mapping; the new fields are grouped by Batch ID and Original batch ID:

Table 8–1 RA Manager Field Mapping

Maps these Fields in /suspended_usage/telco	To these Fields in /process_audit/batchstat/status
PIN_FLD_BYTES_IN	PIN_FLD_VOLUME_RECEIVED
PIN_FLD_BYTES_OUT	PIN_FLD_BYTES_VOLUME_SEND
PIN_FLD_BYTES_CALL_DURATION	PIN_FLD_BYTES_EVENT_DURATION
PIN_FLD_BYTES_EDR_COUNT	PIN_FLD_BYTES_EDR_COUNT

PCM_OP_PROCESS_AUDIT_POL_PREPARE_WRITEOFF_SUMMARY sets and returns errors if there are any objects other than `/suspended_usage/telco` objects in the input flist.

You can change the behavior of PCM_OP_PROCESS_AUDIT_POL_PREPARE_WRITEOFF_SUMMARY to read and aggregate any fields of the `/suspended_usage` storable class and its subclasses. The opcode can then map this data to corresponding fields in the `/process_audit/batchstat/status` storable class.

Creating New Aggregation Scenarios for Revenue Assurance

Revenue Assurance Manager uses aggregation scenarios to group the data that it collects from the pipeline. If the aggregation scenarios provided with Revenue Assurance Manager do not meet your needs, you can create your own.

Note: You cannot view data from custom scenarios in Revenue Assurance Center.

See "[About Aggregation Scenarios](#)" for more information on how Revenue Assurance Manager uses aggregation scenarios.

To create your own aggregation scenarios:

1. Create an aggregation scenario by using Pricing Center.
See the discussion of working with aggregation scenarios in Pricing Center Help.
2. Create the appropriate `/process_audit/batchstat` subclasses.
See "Creating Custom Fields and Storable Classes" in BRM Developer's Guide for more information.

Note: The new subclasses created must contain an array field of type `PIN_FLD_GROUP_DETAILS`. The `PIN_FLD_ORIGINAL_BATCHID` field must also be created in the array.

3. Create the XML templates used by Universal Event (UE) Loader to load the aggregation data generated by the new scenario.
For more information on how to create new UE Loader templates, see Developer Center Help.
4. Modify the PCM_OP_PROCESS_AUDIT_POL_CREATE_AND_LINK policy opcode to check for duplication of records in the newly created `/process_audit` object.
See "[Customizing /process_audit/batchstat Object Validation](#)" for more information.

Changing the Control Point for Data on Written-Off EDRs

The control point ID to collect revenue assurance data on written-off EDRs is configured in the Connection Manager configuration file (`BRM_Home/sys/cm/pin.conf`). See "[About Collecting Revenue Assurance Data on Written-Off EDRs](#)" for more information.

To change the control point ID:

1. Open the Connection Manager (CM) *BRM_Home/sys/cm/pin.conf* file in a text editor.
2. Change the control point ID in the `writtoff_control_point_id` entry.
The default control point ID is `CP_SuspenseWriteOff`.
3. Save and close the file.
4. Stop and restart the CM.

See the discussion of starting and stopping the BRM system in *BRM System Administrator's Guide* for more information.

Customizing Revenue Assurance Center

You can use the **racustom.properties** file to customize some features in Revenue Assurance Center. The file is located in *Revenue Assurance Center_home\RevenueAssuranceCenter\lib*.

The **racustom.properties** file contains the following text:

```
# racustom.properties
# Revenue Assurance Center's customizable properties file
# RA Details screen default view by option is configured using the # following
# key. The valid value for this key should be any of 0 #or 1 or 2 or 3 or 4
#Service Type = 0
#BatchID      = 1
#Revenue Stream = 2
#Output Stream  = 3
#Suspense Reason = 4
ra.ratingdetail.default.viewby.value=0
ra.reratingdetail.default.viewby.value=0
ra.status.success=Success
ra.status.suspended=Suspense
ra.status.writtenoff=WRITTEN-OFF
ra.searchdlg.rating.servicetype.items=SMS,GSM
ra.searchdlg.rating.revenuestream.items=Wholesale,Retail
ra.searchdlg.rerating.servicetype.items=SMS,GSM
ra.searchdlg.rerating.revenuestream.items=Wholesale,Retail
ra.common.currency.symbol=$
ra.common.decimal.separator=.
ra.common.currentlocale=en
```

The file specifies:

- The option settings from the Revenue Assurance Center Customize Table dialog box.
- The default grouping parameter for the Revenue Assurance Center Details screen. The Details screen displays revenue assurance data organized by the default grouping parameter.

You can manually change this default configuration by changing the number value in the strings of this type:

```
ra.ratingdetail.default.viewby.value=0
```

The line above shows Service Type selected as the default. If you change **0** to **2**, your default option becomes **Revenue Stream**.

- The **Service type** search options in the rating and rerating Search dialog box.

Add service types to these lines to add search options to the dialog box:

```
ra.searchdlg.rating.servicetype.items=SMS,GSM
ra.searchdlg.rerating.servicetype.items=SMS,GSM
```

- The revenue stream options in the rating and rerating Search dialog boxes.

Add revenue streams to these lines to add search options to the dialog box:

```
ra.searchdlg.rating.revenuestream.items=Wholesale,Retail
ra.searchdlg.rerating.revenuestream.items=Wholesale,Retail
```

- The default system currency. The default is US Dollars (ISO code 840); you can change this to any other currency type. To change the default currency to Euros, use the Unicode escape sequence code shown below:

```
ra.common.currency.symbol=\u20AC
```

- The default decimal separator (.) for the default currency. If the default currency is changed from US Dollars to euros, change the decimal separator to a comma (,).

```
ra.common.decimal.separator=,
```

- The current locale of the BRM server in which CM is running. You can change this locale if necessary. The default setting is English.

```
ra.common.currentlocale=en
```

[Table 8–2](#) lists the additional locales that are supported:

Table 8–2 Supported Locales

Language	Locale
German	de
Portuguese (Brazilian)	pt_BR
Japanese	ja
Spanish	es
French	fr
Italian	it

Revenue Assurance Utilities

This chapter provides reference information for Oracle Communications Billing and Revenue Management (BRM) revenue assurance utilities.

load_ara_config_object

Use the **load_ara_config_object** utility to specify how to check for duplicate audit objects. This utility loads data into the **/config/process_audit_conf** object in the Oracle Communications Billing and Revenue Management (BRM) database.

Caution: The **load_ara_config_object** utility overwrites existing **/config/process_audit_conf** objects. If you are updating existing configuration data, you cannot load new configuration data only. You must load complete sets of configuration data each time you run the **load_ara_config_object** utility.

Important: To connect to the BRM database, the **load_ara_config_object** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

load_ara_config_object *pin_config_audit_conf_file*

Parameters

pin_config_audit_conf_file

The name and location of the file that defines the **/process_audit** object fields used for performing duplicate checks. By default, the utility uses the *BRM_Home/sys/data/config/pin_config_audit_conf* file.

Tip: The file must be named **pin_config_audit_conf**.

If you run the command in a different directory from where the **pin_config_audit_conf** file is located, you must include the entire path for the file.

Results

The **load_ara_config_object** utility notifies you only if it encounters errors. Look in the **default.pinlog** file for errors. This file is either in the directory from which the utility was started, or in a directory specified in the utility configuration file.

load_pin_config_batchstat_link

The **load_pin_config_batchstat_link** utility loads linking data into the **/config/link_batchstat** object in the Oracle Communications Billing and Revenue Management (BRM) database.

Caution: The **load_pin_config_batchstat_link** utility overwrites existing **/config/link_batchstat** objects. If you are updating existing linking data, you cannot load new linking data only. You must load complete sets of linking data each time you run the **load_pin_config_batchstat_link** utility.

Important: To connect to the BRM database, the **load_pin_config_batchstat_link** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

```
load_pin_config_batchstat_link pin_config_batchstat_link_file
```

Parameters

pin_config_batchstat_link_file

The name and location of the file that defines the linking data objects. The default **pin_config_batchstat_link** file is in *BRM_Home/sys/data/config/pin_config_batchstat_link*.

Tip: If you copy the **pin_config_batchstat_link** file to the directory from which you run the **load_pin_config_batchstat_link** utility, you do not have to specify the path or file name.

If you load the **pin_config_batchstat_link** file from a different directory, you must include the entire path for the file.

Results

If the utility does not notify you that it was successful, look in the **default.pinlog** file to find any errors. This file is either in the directory from which the utility was started or in a directory specified in the utility configuration file.

load_pin_config_controlpoint_link

The **load_pin_config_controlpoint_link** utility loads control point linking data into the **config/link_controlpoint** object in the Oracle Communications Billing and Revenue Management (BRM) database.

Note: This utility does not support branding.

Caution: The **load_pin_config_controlpoint_link** utility overwrites existing **/config/link_controlpoint** objects. If you are updating existing linking data, you cannot load new linking data only. You must load complete sets of linking data each time you run the **load_pin_config_controlpoint_link** utility.

Important: To connect to the BRM database, the **load_pin_config_controlpoint_link** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

load_pin_config_controlpoint_link pin_config_controlpoint_link

Parameters

pin_config_controlpoint_link

The name and location of the file that defines the linking data objects. The default **pin_config_controlpoint_link** file is in *BRM_Home/sys/data/config/pin_config_controlpoint_link*.

Tip: If you copy the **pinonfig_controlpoint_link** file to the directory from which you run the **load_pin_config_controlpoint_link** utility, you do not have to specify the path or file name.

If you load the **pin_config_controlpoint_link** file from a different directory, you must include the entire path for the file.

Results

If the utility does not notify you that it was successful, look in the **default.pinlog** file to find any errors. This file is either in the directory from which the utility was started or in a directory specified in the utility configuration file.

load_pin_config_ra_alerts

Use the **load_pin_config_ra_alerts** utility to configure email details in the **/config/ra_alerts** object in the Oracle Communications Billing and Revenue Management (BRM) database. You define these email details in the **pin_config_ra_alerts** file in *BRM_Home/sys/data/config*.

See "Configuring Email Alerts" in *BRM Collecting Revenue Assurance Data* for more information.

Caution: The **load_pin_config_ra_alerts** utility overwrites existing **/config/ra_alerts** objects. If you are updating revenue assurance alerts, you cannot load new alerts only. You must load complete sets of alerts each time you run the **load_pin_config_ra_alerts** utility.

Important: To connect to the BRM database, the **load_pin_config_ra_alerts** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

```
load_pin_config_ra_thresholds pin_config_ra_alerts
```

Parameters

pin_config_ra_alerts

The name and location of the file that contains the configured alert. The default **pin_config_ra_alerts** file is in *BRM_Home/sys/data/config*.

The **pin_config_ra_alerts** file contains the rules for configuring email details and includes an example. You can customize this example and configure your email details.

If you do not run the utility from the directory in which the file is located, you must include the complete path to the file, for example:

```
load_pin_config_ra_thresholds BRM_Home/sys/data/config/pin_config_ra_alerts
```

Tip: If you copy the **pin_config_ra_alerts** file to the directory from which you run the **load_pin_config_ra_alerts** utility, you do not have to specify the path or file name. The file must be named **pin_config_ra_alerts**.

Results

The **load_pin_config_ra_alerts** utility notifies you when it successfully creates the **/config/ra_alerts** object. Otherwise, look in the **default.pinlog** file for errors. This file is

either in the directory from which the utility was started or in a directory specified in the utility configuration file.

To verify that the alerts were loaded, display the **/config/ra_alerts** object by using the Object Browser, or use the **robj** command with the **testnap** utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

load_pin_config_ra_flows

Use the **load_pin_config_ra_flows** utility to load revenue assurance flows into the **/config/ra_flows** object in the Oracle Communications Billing and Revenue Management (BRM) database. You define the flows in the **pin_config_ra_flows** file in *BRM_Home/sys/data/config*.

See "Adding Control Points to Flows" in *BRM Collecting Revenue Assurance Data* for more information.

Caution: The **load_pin_config_ra_flows** utility overwrites existing flows. If you are updating flows, you cannot load new flows only. You must load complete sets of flows each time you run the **load_pin_config_ra_flows** utility.

Important: To connect to the BRM database, the **load_pin_config_ra_flows** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

```
load_pin_config_ra_flows pin_config_ra_flows
```

Parameters

pin_config_ra_flows

The name and location of the file that contains the configured flows. The default **pin_config_ra_flows** file is in *BRM_Home/sys/data/config*.

The **pin_config_ra_flows** file contains the rules for configuring flows and includes an example. You can customize this example and configure flows.

If you do not run the utility from the directory in which the file is located, you must include the complete path to the file, for example:

```
load_pin_config_ra_flow BRM_Home/sys/data/config/pin_config_ra_flows
```

Tip: If you copy the **pin_config_ra_flows** file to the directory from which you run the **load_pin_config_ra_flows** utility, you do not have to specify the path or file name. The file must be named **pin_config_ra_flows**.

Results

The **load_pin_config_ra_flows** utility notifies you when it successfully creates the **/config/ra_flows** object. Otherwise, look in the **default.pinlog** file for errors. This file is either in the directory from which the utility was started or in a directory specified in the utility configuration file.

To verify that the flows were loaded, display the `/config/ra_flows` object by using the Object Browser, or use the **robj** command with the **testnap** utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

load_pin_config_ra_thresholds

Use the **load_pin_config_ra_thresholds** utility to load revenue assurance alert threshold details into the **/config/ra_thresholds** object in the Oracle Communications Billing and Revenue Management (BRM) database. You define these thresholds in the **pin_config_ra_thresholds** file in *BRM_Home/sys/data/config*.

See "Configuring Alert Thresholds" in *BRM Collecting Revenue Assurance Data* for more information.

Caution: The **load_pin_config_ra_thresholds** utility overwrites existing thresholds. If you are updating revenue assurance thresholds, you cannot load new thresholds only. You must load complete sets of thresholds each time you run the **load_pin_config_ra_thresholds** utility.

Important: To connect to the BRM database, the **load_pin_config_ra_thresholds** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information.

Location

BRM_Home/bin

Syntax

```
load_pin_config_ra_thresholds pin_config_ra_thresholds
```

Parameters

pin_config_ra_thresholds

The name and location of the file that contains the configured threshold details. The default **pin_config_ra_thresholds** file is in *BRM_Home/sys/data/config*.

The **pin_config_ra_thresholds** file contains the rules for configuring thresholds and includes an example. You can customize this example and configure thresholds.

If you do not run the utility from the directory in which the file is located, you must include the complete path to the file, for example:

```
load_pin_config_ra_thresholds BRM_Home/sys/data/config/pin_config_ra_thresholds
```

Tip: If you copy the **pin_config_ra_thresholds** file to the directory from which you run the **load_pin_config_ra_thresholds** utility, you do not have to specify the path or file name. The file must be named **pin_config_ra_thresholds**.

Results

The **load_pin_config_ra_thresholds** utility notifies you when it successfully creates the **/config/ra_thresholds** object. Otherwise, look in the **default.pinlog** file for errors. This file is either in the directory from which the utility was started, or in a directory specified in the utility configuration file.

To verify that the alert thresholds were loaded, display the **/config/ra_thresholds** object by using the Object Browser, or use the **robj** command with the **testnap** utility. See "Reading an Object and Writing its Contents to a File" in *BRM Developer's Guide* for more information.

pin_ra_check_thresholds

Use the **pin_ra_check_thresholds** utility to notify you when the **/config/re_thresholds** object contains revenue assurance alerts. Alerts are loaded into this object if the revenue assurance thresholds you have configured are crossed.

See "Configuring Alert Thresholds" in *BRM Collecting Revenue Assurance Data* for more information.

Important: To connect to the Oracle Communications Billing and Revenue Management (BRM) database, the **pin_ra_check_thresholds** utility needs a configuration file in the directory from which you run the utility. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide* for more information. You can change the configuration **logfile** and **loglevel** entries as needed.

Location

BRM_Home/bin

Syntax

pin_ra_check_thresholds

Parameters

There are no parameters for the **pin_ra_check_thresholds** utility.

Results

The **pin_ra_check_thresholds** utility returns the values listed in "[Return Values](#)" and logs other information in the revenue assurance log file. This log file is either in the directory from which this utility was started or in a directory specified in the utility configuration file.

Return Values

pin_ra_check_thresholds returns the following:

- **0** - on success
- **1** - error opening the PCM connection
- **2** - **/config/thresholds** object not present
- **3** - all other errors

