

**Oracle® Communications
Billing and Revenue Management**

Installation Guide

Release 7.5

E16706-27

December 2019

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Preface

This document provides an overview of the types of configurations for your Oracle Communications Billing and Revenue Management (BRM) system. This document also describes the system requirements and procedures for installing and configuring your BRM system.

Audience

This document is intended for system administrators and those involved in planning BRM systems.

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>

Additional Oracle Communications documentation is available from the Oracle software delivery Web site:

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Document Revision History

The following table lists the revision history for this document:

Version	Date	Description
E16706-01	November 2011	Initial release.

Version	Date	Description
E16706-02	March 2012	Documentation updates for Pipeline Configuration Center (PCC). <ul style="list-style-type: none"> ■ Added "Installing Pipeline Configuration Center".
E16706-03	May 2012	Documentation updates for BRM 7.5 Patch Set 1. <ul style="list-style-type: none"> ■ Made minor formatting and text changes.
E16706-03	August 2012	Documentation updates for BRM 7.5 Patch Set 2. <ul style="list-style-type: none"> ■ Updated the third-party vendor information in "BRM Software Compatibility".
E16706-04	October 2012	Documentation updates for PCC. <ul style="list-style-type: none"> ■ Updated the following information in "Installing Pipeline Configuration Center": <ul style="list-style-type: none"> Added Configuring a Connection from PCC to BRM. Added Securing the Infranet.properties File. Updated Table 13–2, "PCC Software Requirements". ■ Made minor text changes.
E16706-05	December 2012	Documentation updates for BRM 7.5 Patch Set 3. <ul style="list-style-type: none"> ■ Updated "Other Compatible Software". ■ Added "About Using Virtual Columns". ■ Made minor formatting and text changes.
E16706-06	March 2013	Documentation updates for BRM 7.5 Patch Set 4. <ul style="list-style-type: none"> ■ Replaced multidatabase information with multischema information (except in the account synchronization chapters). See especially "Installing a Multischema System".
E16706-07	July 2013	Documentation updates for BRM 7.5 Patch Set 5. <ul style="list-style-type: none"> ■ Added "Creating an Acknowledgment Queue for Account Migration Manager". ■ Replaced multidatabase information with multischema information in the account synchronization chapters (see Part IV, "Installing Account Synchronization"). ■ Updated "Other Compatible Software".
E16706-08	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. <ul style="list-style-type: none"> ■ Added "HP-UX IA64". ■ Updated "Installing the Third-Party Software". ■ Updated "Installing BRM". ■ Updated "Installing BRM Client and Server Applications on UNIX". ■ Updated "Installing Paymentech Manager". ■ Updated "Troubleshooting the BRM Installation". ■ Updated "Installing Multiple BRM Instances on One System for Testing". ■ Updated "Installing Pipeline Manager". ■ Updated "Installing and Configuring Account Synchronization".

Version	Date	Description
E16706-09	October 2013	<p>Documentation updates for BRM 7.5 Patch Set 6.</p> <ul style="list-style-type: none"> Added Oracle Database 12c Release 1 in the following sections: <ul style="list-style-type: none"> Solaris AIX Linux Made minor formatting and text changes.
E16706-10	February 2014	<p>Documentation updates for BRM 7.5 Patch Set 7.</p> <ul style="list-style-type: none"> Added Oracle Database 12c Release 1 in the following section: <ul style="list-style-type: none"> HP-UX IA64 Added Microsoft Visual Studio 2012 Update 4 in the following section: <ul style="list-style-type: none"> Windows Made minor formatting and text changes.
E16706-11	May 2014	<p>Documentation updates for BRM 7.5 Patch Set 8.</p> <ul style="list-style-type: none"> Updated "Other Compatible Software".
E16706-12	August 2014	<p>Documentation updates for BRM 7.5 Patch Set 9.</p> <ul style="list-style-type: none"> Added documentation for RADIUS Manager. Updated "Other Compatible Software".
E16706-13	October 2014	<p>Documentation updates for BRM 7.5 Patch Set 10.</p> <ul style="list-style-type: none"> Updated the following sections: <ul style="list-style-type: none"> Windows Other Compatible Software Setting Up Schema Qualifications Starting and Using a BRM Client Application Running Payment Tool on Windows 7 and Windows 8.1 Starting Customer Center Uninstalling Customer Center from a Client System Starting Pricing Center Uninstalling Pricing Center from a Client System Uninstalling Pricing Center from Windows Installing Customer Center SDK Operating System Security PCC System Requirements Uninstalling BRM Client Applications Installing Pipeline Manager Creating Additional Account Synchronization Queues Updated step 4 in "Running pin_multidb.pl -i".
E16706-14	January 2015	<p>Documentation updates for BRM 7.5 Patch Set 11.</p> <ul style="list-style-type: none"> Added "About Oracle Exalogic and Oracle Exadata". Made multiple updates in "Installing Pipeline Configuration Center".

Version	Date	Description
E16706-15	June 2015	<p>Documentation updates for BRM 7.5 Patch Set 12.</p> <ul style="list-style-type: none"> Updated the following sections: <ul style="list-style-type: none"> Creating the BRM User for Oracle Other Compatible Software Setting Up Schema Qualifications
E16707-16	August 2015	<p>Documentation updates for BRM 7.5 Maintenance Patch Set 1.</p> <ul style="list-style-type: none"> Updated the partitioning and purging information in Chapter 7, "Installing BRM". Updated the following sections: <ul style="list-style-type: none"> A BRM Production System Other Compatible Software Setting Up Schema Qualifications Installing Customer Center SDK Installing the Localization SDK on Windows Installing the Customer Center Files Starting Pricing Center from Java Web Start System Requirements Installing Tax Calculation Managers in a Multischema Environment What's Next? Reinitializing Optional Component Data Only
E16706-17	December 2015	<p>Documentation updates for BRM 7.5 Patch Set 14.</p> <ul style="list-style-type: none"> Updated the following sections: <ul style="list-style-type: none"> Other Compatible Software Before Installing BRM Client Applications
E16706-18	April 2016	<p>Documentation updates for BRM 7.5 Patch Set 15.</p> <ul style="list-style-type: none"> Updated the following sections: <ul style="list-style-type: none"> Linux Other Compatible Software Granting Execute Permission for billing_updates Added the following section: <ul style="list-style-type: none"> Using Localized PCC
E16706-19	August 2016	<p>Documentation updates for BRM 7.5 Patch Set 16.</p> <ul style="list-style-type: none"> Updated the following sections: <ul style="list-style-type: none"> Linux Other Compatible Software Using Localized PCC

Version	Date	Description
E16706-20	December 2016	Documentation updates for BRM 7.5 Patch Set 17. <ul style="list-style-type: none"> Updated the following sections to add information about Solaris 11: <ul style="list-style-type: none"> Solaris Installing BRM Installing the Third-Party Software Installing Pipeline Manager
E16706-21	April 2017	Documentation updates for BRM 7.5 Patch Set 18. <ul style="list-style-type: none"> Updated the "Other Compatible Software" section to add information about the latest certified Perl version.
E16706-22	May 2017	Updated the " Other Compatible Software " section to include information on the Perl versions that are not supported.
E16706-23	August 2017	Updated the " Other Compatible Software " section to include information about the new HttpClient version. Updated the Database Servers section in the following sections to include information on Oracle Real Application Clusters 12c R1: <ul style="list-style-type: none"> Solaris AIX Linux HP-UX IA64
E16706-24	December 2017	Updated the " Other Compatible Software " section to include information on Vertex Communications Tax Q Series.
E16706-25	April 2018	Updated the " Other Compatible Software " section to include information on Perl and Xalan.
E16706-26	November 2018	Documentation updates for BRM 7.5 Patch Set 22. Updated the following chapter: <ul style="list-style-type: none"> Installing Pipeline Configuration Center Updated the following section: <ul style="list-style-type: none"> Other Compatible Software
E16706-27	December 2019	Documentation updates for BRM 7.5 Patch Set 23. Updated the following chapter: <ul style="list-style-type: none"> Installing Pipeline Configuration Center Updated the following section: <ul style="list-style-type: none"> Other Compatible Software

Part I

Getting Started with BRM Installation

Part I provides information about getting started with your Oracle Communications Billing and Revenue Management (BRM) installation. It contains the following chapters:

- [BRM Installation Overview](#)
- [BRM Software Compatibility](#)
- [Database Configuration and Tuning](#)
- [System Requirements](#)

BRM Installation Overview

This chapter describes examples of basic configurations for your Oracle Communications Billing and Revenue Management (BRM) system. It also describes the high-level steps for installing and configuring your BRM system.

Before installing BRM, you must know the following information:

- Basic BRM concepts. See "Introducing BRM" in *BRM Concepts*.
- BRM system architecture. See "BRM System Architecture" in *BRM Concepts*.
- Basic database administration concepts. See your database documentation.

About Planning and Installing a BRM System

To install and use BRM, you must plan your system by performing the following tasks:

- Determine the services you want to provide; for example, email, telephony, and GSM wireless.
- Determine the type of events you want to rate and how you want to rate them; for example, real-time events and batch events.
- Determine whether you want your customers to prepay for the service or some services or post-pay for the services.
- Depending on the services you want to provide, the event types to rate, (real-time or batch), and the payment type (prepaid or postpaid), decide on the BRM system to install and configure.
- Choose the components you want to install.
- Install BRM and the optional component.
- Configure each component to point to its peer on the server side; for example, configure the Connection Managers (CMs) to point to the Data Managers (DMs) and the DMs to point to the database.

Each BRM component includes a configuration file, such as a **pin.conf**, **.reg**, or **.properties** file, which you edit to set the environment variables and connection parameters. The configuration files include instructions for all the entries. See "Using Configuration Files to Connect and Configure Components" in *BRM System Administrator's Guide*.

Downloading the BRM Applications Software

To download the software from the Oracle Software Delivery Cloud Web site (<https://edelivery.oracle.com>):

1. Select the BRM Applications software for your platform from the Oracle E-Delivery Web site.
2. Download the selected software.
3. Extract the components that you need from the downloaded file.
4. Follow the installation procedure for each component that you want to install.

Types of BRM Systems

The type of BRM system you install depends on your business needs and the licensing agreement you have with Oracle. For more information on BRM system architecture, see "BRM System Architecture" in *BRM Concepts*.

Note: For more information about UNIX platform and software compatibility, see ["Overview of Hardware and Software Requirements"](#).

A BRM Demonstration System

For a simple demonstration system or a small application development environment, you can run all of the BRM components, including the database server, on a single computer as shown in [Figure 1-1](#).

Figure 1-1 Simple Demonstration System Configuration

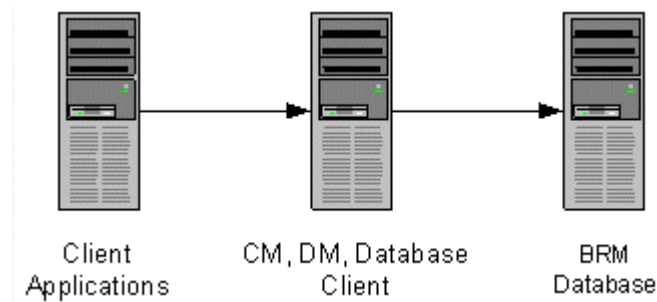


For example, you can use a demonstration system for testing your business policies and pricing plans. After you create test accounts, you can generate events to ensure that your pricing model is working correctly. For final pre-production testing, however, you should use a test system that mirrors your production system configuration.

Important: A single-computer configuration is not adequate for a typical production BRM system.

A BRM Production System

For best performance on a production system, you must distribute the BRM components among several computers as shown in [Figure 1-2](#).

Figure 1–2 Production System Configuration

By using this basic production configuration, you can expand your BRM system to meet your production needs. You can also add components while BRM is running.

- You can set up multiple machines that each run the CM and DM to increase reliability and performance and to ensure that you continuously have at least one copy of the processes running.
- For additional reliability, you can also set up CM Master Processes (CMMPs) that route requests to an alternate CM when a CM fails. For more information on CMMPs, see "About Connection Manager Master Processes (CMMPs)" in *BRM Concepts*.
- You can use redundant subnets for CM and DM systems, and CMs and DMs can share the same subnet. The only access point is the BRM database, which can be replicated as needed.

The following examples show how you can distribute these components across multiple computers.

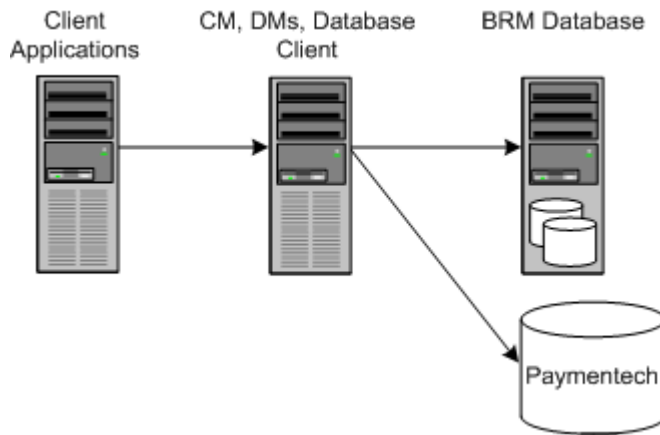
Small Production System

[Figure 1–3](#) shows the minimum level of distributed components. This is a typical configuration for a small number of customers.

- All BRM client applications, such as Pricing Center, are installed on the same machine.
- The CM and DM are installed on the same machine to optimize performance.
- The database client is installed on the DM machine.

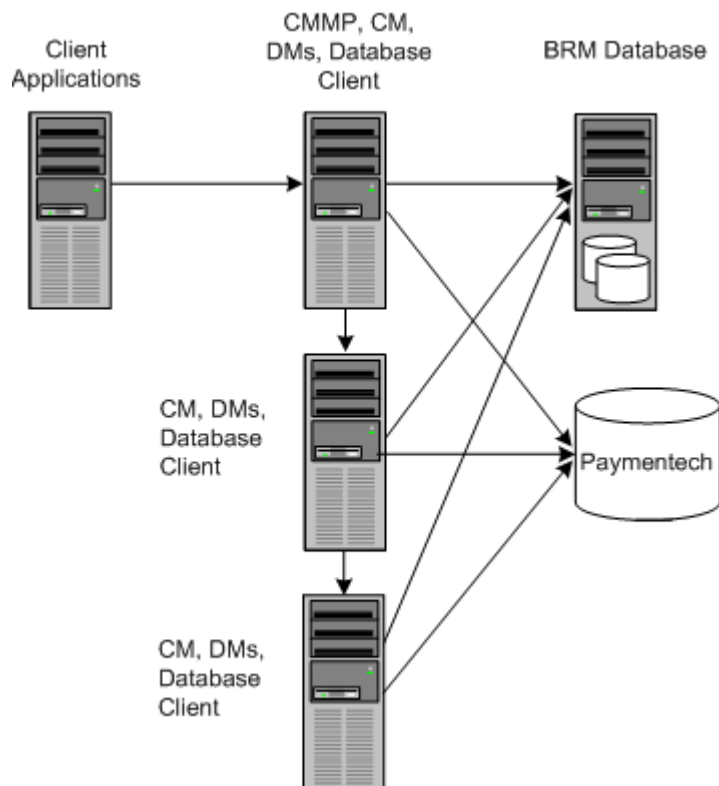
Important: If your database and DM are on separate machines, you must install the database client on the DM machine.

- The BRM database is installed on the separate machine.

Figure 1-3 Minimum Level of Distributed Components

Medium Production System

Figure 1-4 shows a typical mid-size production system that uses multiple machines for the CM and DM. A CMMP is added to route connections from the client applications to the different CMs.

Figure 1-4 Mid-Size Production System Distributed Components

A High-Availability Production System

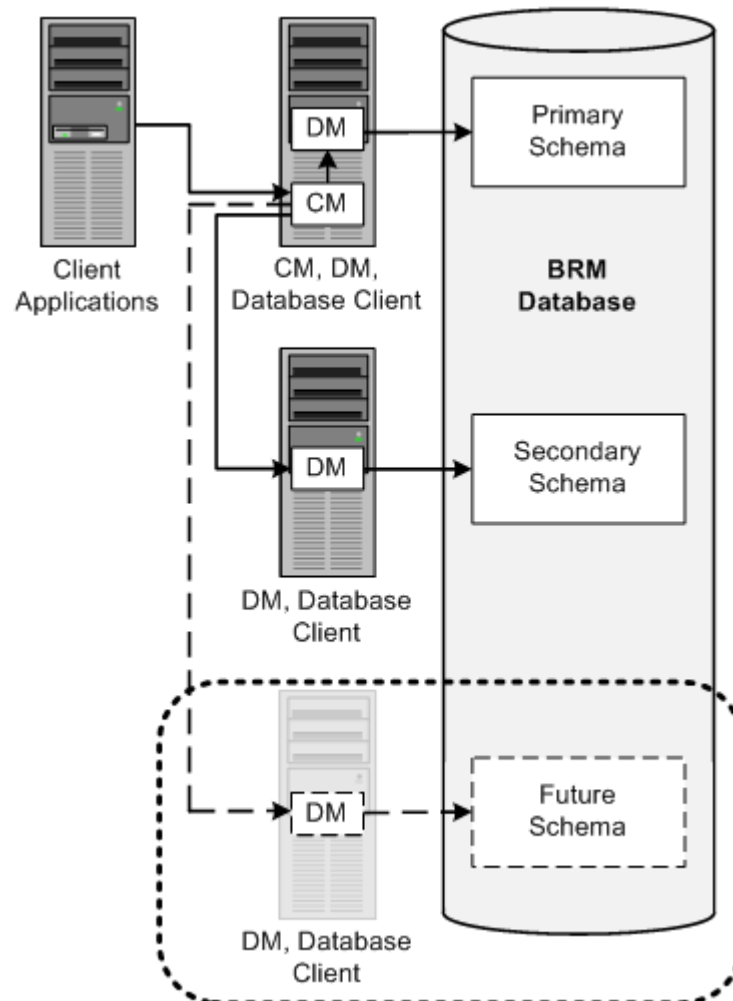
To create a high-availability system, you must install and configure *at least two* instances of each component and then connect each instance to all instances of the component's server-side peer. This ensures that if one instance of a component fails, another one is available to process data.

For more information on setting up a high-availability system, see "Understanding a High-Availability System" in *BRM System Administrator's Guide*.

A BRM Multischema Production System

Although BRM works well with a single database schema for BRM data, you can improve scalability and support load balancing by distributing BRM data among multiple schemas as shown in Figure 1-5. In addition, the accounts and associated objects in one schema continue functioning when another schema is down.

Figure 1-5 BRM Multischema Production System



Designing the Optimal Multischema System

To optimize the benefits of a multischema system, you must decide the following when designing your multischema system:

- How to split BRM applications among multiple schemas

- How to split subscriber data among multiple schemas

To reduce contention at the primary database schema, Oracle recommends the following:

- Set every application to connect to the primary schema.

Important: Any application or utility that directly changes the configuration data, such as Pricing Center, Configuration Center, and Developer Center, must be connected to the primary schema.

- Distribute accounts among the secondary schemas.

In this configuration, all accounts and associated data are stored in the secondary schemas. Configuration, pricing, audit trail, and uniqueness data is stored and updated in the primary schema and then made available to the secondary schemas.

If the primary schema goes down, you can still use RADIUS Manager to access accounts in the secondary schemas. However, to ensure data integrity, you cannot make updates to the primary schema when it is down.

Assigning Accounts to a Database Schema

To set up account distribution for your multischema system, you must first understand that the Multidatabase Manager assigns accounts to a particular database schema based on account hierarchy, schema status, and schema priority.

Account Hierarchy

The Multidatabase Manager stores data as follows:

- All accounts of the same a brand in the same database schema
- All subordinate bill units in the same schema as their parent accounts
- All sponsored accounts in the same schema as their sponsor group
- All accounts associated with a device in the same schema as the device

Therefore, the Multidatabase Manager assigns a subordinate account to the same schema as the parent account, even if the schema has a status of closed or unavailable.

Important: In a multischema system, the Billing Provider and Content Provider reports are accurate only when each content provider account's associated remittance objects, remittance events, content connector events, and user accounts are in the same schema. If those items are not all in the same schema, some data will not be included in the reports.

Database Schema Status

Database schemas are either open, closed, or unavailable. Open schemas are always available for account creation. At installation time, only the primary schema is set to open.

Closed schemas are not used for account creation under most circumstances. Accounts are created in a closed schema only if the account's parent, branded, or sponsoring account belongs to that schema or if all schemas are closed. If all schemas are closed, the Multidatabase Manager chooses a closed schema at random in which to create accounts and continues to create accounts in that schema until a schema becomes

open. A schema's status can be manually changed to closed to limit the number of accounts created in the schema, or it can be automatically changed by the Multidatabase Manager when the schema reaches a predefined maximum limit.

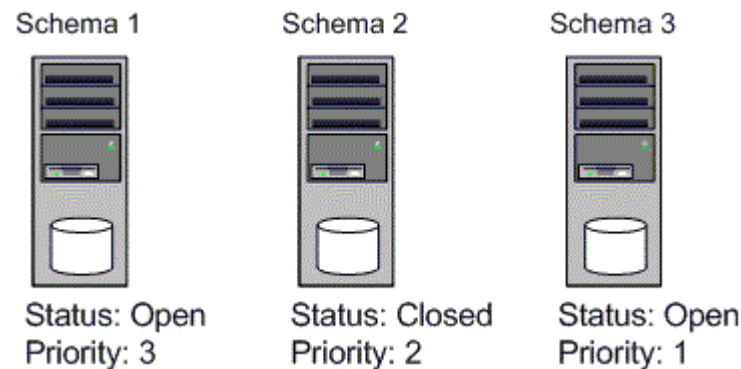
Unavailable schemas are not used for account creation unless the schema contains the account's parent, sponsoring, or branded account. You can change a schema's status to unavailable at any time to suit your system requirements. You might do this, for example, to prevent accounts from being created in the primary schema.

For information on how to set the schema status, see "Setting Database Schema Status" in *BRM System Administrator's Guide*.

Database Schema Priority

Database schema priority determines when customer accounts are created on a particular schema relative to other schemas. The Multidatabase Manager assigns accounts to an open schema with the highest priority number. In the example shown in Figure 1–6, the Multidatabase Manager assigns accounts to schema 3 because it has the highest priority number of all open schemas.

Figure 1–6 Multischema Account Creation Based on Status and Priority



If all schemas have the same priority, the Multidatabase Manager chooses an open schema at random each time it assigns an account. This distributes accounts evenly across all schemas.

For information on how to set the schema priority, see "Setting Database Schema Priorities" in *BRM System Administrator's Guide*.

Setting Up a System Based on Event-Type Rating

After you determine whether you want your customers to prepay or postpay for one or more services and determine how to rate events (in real time, in batch, or in a combination of the two) you can set up your BRM system appropriately. A system that performs both types of rating is called a *convergent* system.

This section describes systems that are configured for the following:

- Real-time rating (postpaid or prepaid events)
- Batch rating (postpaid events)
- Convergent rating (real-time rating and batch rating, and prepaid and postpaid events)

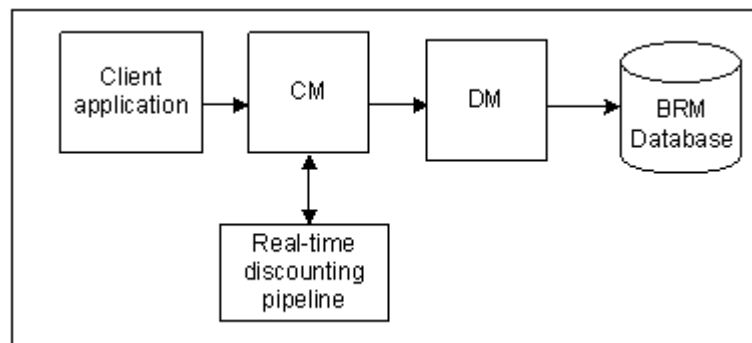
Postpaid Real-Time Rating

A basic BRM system to rate postpaid real-time events includes the following components:

- Client applications either provided by BRM, such as Customer Center, or custom-made, such as a CRM application that you develop
- CM along with the necessary Facilities Modules (FMs)
- Real-time discounting pipeline if your rating includes discounts
- DM
- Database

Figure 1–7 shows a basic BRM system for rating postpaid real-time events:

Figure 1–7 Basic Postpaid Real-Time Events Rating BRM System



Prepaid Real-Time Rating

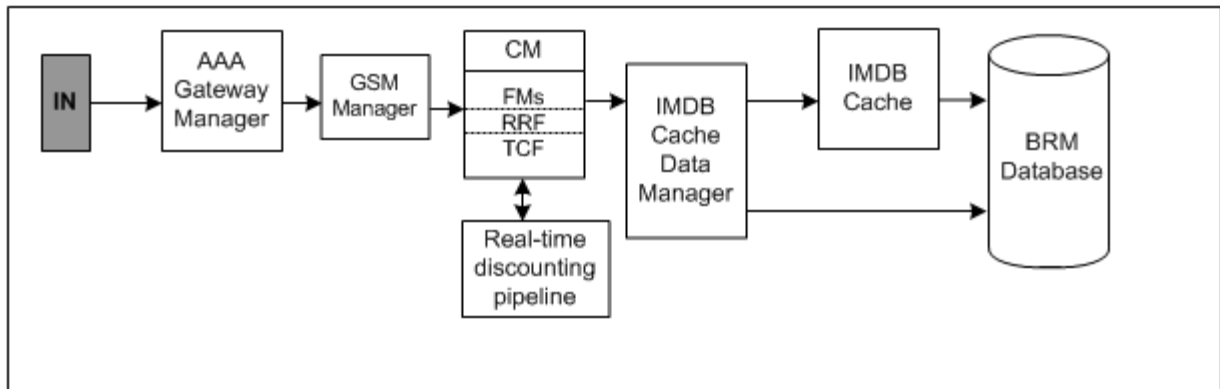
A basic BRM system to rate prepaid events includes the following components:

- Service-specific client applications, such as GSM AAA Manager or GPRS AAA Manager

Note: To support custom service types, install Services Framework AAA Manager.

- CM and Resource Reservation Manager (RRM)
- Real-time discounting pipeline if your rating includes discounts
- IMDB Cache DM
- IMDB Cache for high throughput and low latency for processing prepaid AAA requests
- Database

Figure 1–8 shows a basic BRM system for rating prepaid events:

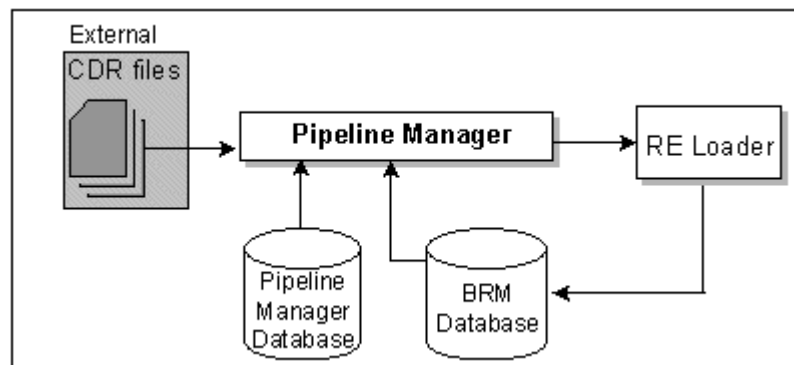
Figure 1–8 Basic Prepaid Rating BRM System

Postpaid Batch Rating

Batch events are not rated in real time. A basic BRM system to rate batch events in a pipeline includes the following components:

- Pipeline Manager
- Pipeline Manager database
- Rated Event (RE) Loader to load the rated events into the BRM database

Figure 1–9 shows a basic BRM system for rating batch events:

Figure 1–9 Basic Batch Rating BRM System

Convergent Rating

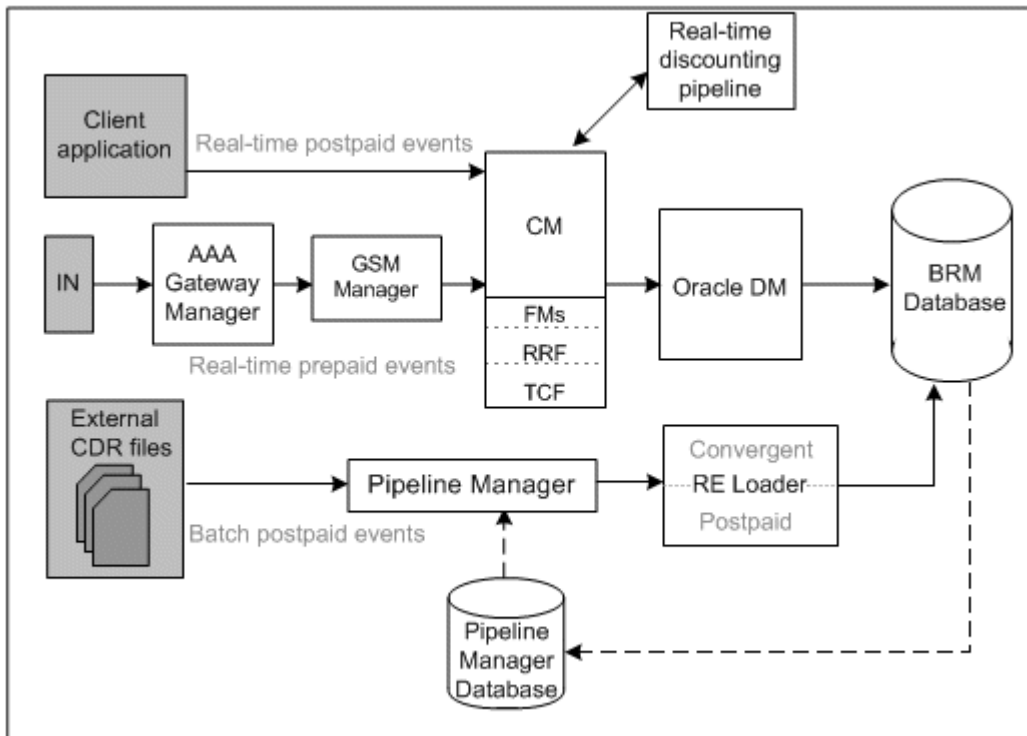
A BRM system that handles prepaid and postpaid accounts and real-time and batch event rating is called a *convergent* system. A *convergent* system requires the components for all types of rating. For example:

- Client applications
- Service-specific client applications
- Real-time discounting pipeline if your rating includes discounts
- CM along with the necessary FMs
- Resource Reservation Framework

- Pipeline Manager and Pipeline Manager database
- Rated Event Loader to load the rated events into the BRM database
- Oracle DM and database

Figure 1–10 shows a BRM system for rating both prepaid and postpaid (real-time and batch) events:

Figure 1–10 Convergent Rating BRM System



Convergent systems require objects to be stored in the BRM database, the pipeline memory, or both.

The pipeline memory consists of the DAT_AccountBatch and DAT_BalanceBatch modules. The DAT_AccountBatch module contains persistent account data that is stored in the database and the DAT_BalanceBatch module contains balance data that is stored in memory. This information is used during batch event processing.

You can configure your BRM system so only the required set of objects is loaded into pipeline memory. This reduces the load time during initialization and data synchronization operations and minimizes memory size. For more information, see "Optimizing BRM for Prepaid and Postpaid Convergence" in *BRM System Administrator's Guide*.

Installation Overview

The BRM system uses a four-tier architecture. To set up this system, you must ensure that each component of the architecture connects to the other components. This section provides a high-level breakdown of the four-tier installation process.

Note: This section provides guidance only on configuring the components of a BRM system. It does not discuss processes documented by your database vendor.

High-Level Overview

To complete your four-tier BRM installation, follow these general steps.

1. Determine your hardware and software requirements.
See ["Overview of Hardware and Software Requirements"](#).
2. Install your database.
Refer to the Oracle documentation for information about installing your database.
3. Configure your database by using the directions in the appropriate guide.
See ["Installing and Configuring Oracle: Task List"](#).
4. Install and configure the BRM software.
See ["Installing BRM"](#).
5. Install the BRM client applications:
 - [Installing BRM Client and Server Applications on UNIX](#)
 - [Installing BRM Client and Server Applications on Windows](#)
6. Tune the BRM software for optimal performance.
See ["Improving BRM Performance"](#) in *BRM System Administrator's Guide* and ["Database Configuration and Tuning"](#).

Installing and Configuring a Localized Version of BRM

For general information about using a localized version of BRM, see ["Using BRM in International Markets"](#) in *BRM Developer's Guide*.

Selecting the Database Character Encoding

For new BRM installations, use the appropriate database character sets when setting up your database.

For Oracle, select AL32UTF8 for the standard character set and for the national character set.

Note: BRM 7.5 supports **AL32UTF8** as its default character set. It also continues to support the **UTF8** character set for backward compatibility. The unicode character set **AL32UTF8** is recommended for all new BRM 7.5 deployments.

Getting Help for Installing BRM

If you need technical assistance with installing BRM software, see ["Getting Help with BRM Problems"](#) in *BRM System Administrator's Guide*.

What's Next?

Now that you understand the various ways you can set up your BRM system, you need to know your hardware and software requirements. See "[Overview of Hardware and Software Requirements](#)".

BRM Software Compatibility

This chapter lists the software compatible with Oracle Communications Billing and Revenue Management (BRM) 7.5 server and client systems.

Overview

Before installing the BRM 7.5 server and client systems, note the following:

- BRM 7.5 server components do not support any 32-bit server operating systems.
- BRM 7.5 supports both AL32UTF8 and UTF8 character sets. The default character set is AL32UTF8 and is recommended for all new BRM 7.5 deployments. Upgrades from previous BRM versions can continue to use UTF8, although the recommendation is to migrate to AL32UTF8 to improve future support.
- Oracle supports versions of that software where the software vendor declares backward compatibility to the version certified with BRM and where the upgrade is a minor version increment; for example, from 8.5.1 to 8.5.2.

The following principles are fundamental for maintaining a secure system:

- **Keep software up to date.** You must keep the product and the installed software dependencies up to date. This includes the latest product release and any patches that apply to it.
- **Keep up to date on security information.** Oracle regularly issues security-related patch updates and security alerts. You must install all security patches as soon as possible. See the "Critical Patch Updates and Security Alerts" article on the Oracle Technology Web site:

<http://www.oracle.com/technetwork/topics/security/alerts-086861.html>

Solaris

This section describes the primary software components compatible with an Oracle Solaris implementation.

Operating Systems

Table 2–1 shows the versions of Solaris server and client operating systems compatible with BRM 7.5:

Table 2–1 Server Operating System Versions (Solaris)

Operating System	Notes
Solaris 10	NA
Solaris 11.2 or later releases	Support added in BRM 7.5 Patch Set 15. Important: You cannot upgrade from Solaris 10 to Solaris 11. For Solaris 11, Oracle recommends that you install BRM 7.5 using the BRM 7.5 installer package for Solaris 11.

Note: For BRM 7.5 Patch Set 4 or later patch sets, if BRM is installed on a Solaris server, install the 148198-03 for SPARC patch on that server. You can download the 148198-03 for SPARC patch from the My Oracle Support Web site (<http://support.oracle.com>). For information about installing the Solaris patches, see the Oracle Solaris documentation.

The following clients are supported on Solaris:

- Developer Center
- Self-Care Manager

Compilers

Table 2–2 shows the supported compilers:

Table 2–2 Supported Compilers (Solaris)

Compiler	Notes
Oracle Solaris Studio 12.2	Certified for use on Solaris platforms only.

Database Servers

Table 2–3 shows the compatible database servers (enterprise):

Table 2–3 Compatible Database Servers (Solaris)

Database Server Version	Notes
Oracle Database 10g (Oracle Enterprise)	NA
Oracle Real Application Clusters 10g	Use Oracle Real Application Clusters 10g for high-availability configurations only. For scalability, use a multischema system. See " A BRM Multischema Production System ". BRM 7.5 supports AL32UTF8 as its default character set. It also continues to support the UTF8 character set for BRM installations that are being upgraded to BRM 7.5 from previous versions. The unicode character set AL32UTF8 is recommended for all new BRM 7.5 deployments.

Table 2–3 (Cont.) Compatible Database Servers (Solaris)

Database Server Version	Notes
Oracle Database 11g (Oracle 11.1.0.6 and later patch levels) (Oracle Enterprise)	NA
Oracle Real Application Clusters 11g R1	NA
Oracle Database 11g R2 (Enterprise Edition)	NA
Oracle Real Application Clusters 11g R2	NA
Oracle In-Memory Database (IMDB) Cache 11.2.2.2.0	NA
Oracle Clusterware 11g R1	NA
Oracle Database 12c R1 (Oracle 12.1.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 6.
Oracle Database 12c R1 Patch Set (Oracle 12.1.0.2.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 12.
Oracle Real Application Clusters 12c R1	Support added in BRM 7.5 Patch Set 12.
Oracle Database 12c R2 (Oracle 12.2.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 21.
Oracle Real Application Clusters 12c R2	Support added in BRM 7.5 Patch Set 21.
Oracle Database 18c R1 (Enterprise Edition)	Support added in BRM 7.5 Patch Set 23.
Oracle Real Application Clusters 18c R1	Support added in BRM 7.5 Patch Set 23.

Web Servers

Table 2–4 shows the compatible Web servers:

Table 2–4 Compatible Web Servers (Solaris)

Web Server	Notes
Apache 2.2.4	NA
Apache 2.2.6	NA
Apache 2.2.8	NA
Apache 2.2.10	NA

Web Browsers

Table 2–5 shows the compatible Web browsers:

Table 2–5 Compatible Web Browsers (Solaris)

Version	Notes
Mozilla Firefox 3.0.1	NA

AIX

This section describes the primary software components compatible with an AIX implementation.

Operating Systems

[Table 2–6](#) shows the operating system compatibility for servers and clients:

Table 2–6 Operating System Versions (AIX)

Operating System	Notes
IBM AIX Version 6.1	AIX 6100-07-01-1141
IBM AIX Version 6.1 TL9	Support added in BRM 7.5 Patch Set 10.

The following clients are supported on AIX:

- Developer Center
- Self-Care Manager

Compilers

[Table 2–7](#) shows the supported compilers:

Table 2–7 Supported Compilers (AIX)

Compiler	Notes
xlc 11.1 (xlc 11.1.0.3)	XL C/C++ Runtime for AIX 6.1 (6100-07-01-1141)

Database Servers

[Table 2–8](#) shows the compatible database servers:

Table 2–8 Compatible Database Servers (AIX)

Database Server Version	Notes
Oracle Database 10g (Oracle Enterprise)	NA
Oracle Real Application Clusters 10g	Use Oracle Real Application Clusters 10g for high-availability configurations only. For scalability, use a multischema system. See " A BRM Multischema Production System ". BRM 7.5 supports AL32UTF8 as its default character set. It also continues to support the UTF8 character set for BRM installations that are being upgraded to BRM 7.5 from previous versions. The unicode character set AL32UTF8 is recommended for all new BRM 7.5 deployments.
Oracle Database 11g (Oracle 11.1.0.6 and later patch levels) (Oracle Enterprise)	NA
Oracle Real Application Clusters 11g R1	NA
Oracle Database 11g R2 (Enterprise Edition)	NA

Table 2–8 (Cont.) Compatible Database Servers (AIX)

Database Server Version	Notes
Oracle Real Application Clusters 11g R2	NA
Oracle In-Memory Database (IMDB) Cache 11.2.2.2.2	NA
Oracle Clusterware 11g R1	NA
Oracle Database 12c R1 (Oracle 12.1.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 6.
Oracle Database 12c R1 Patch Set (Oracle 12.1.0.2.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 12.
Oracle Real Application Clusters 12c R1	Support added in BRM 7.5 Patch Set 12.
Oracle Database 12c R2 (Oracle 12.2.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 21.
Oracle Real Application Clusters 12c R2	Support added in BRM 7.5 Patch Set 21.
Oracle Database 18c R1 (Enterprise Edition)	Support added in BRM 7.5 Patch Set 23.
Oracle Real Application Clusters 18c R1	Support added in BRM 7.5 Patch Set 23.

Web Servers

Table 2–9 shows the compatible Web servers:

Table 2–9 Compatible Web Servers (AIX)

Web Server	Notes
Apache 2.2.6	NA

Note: Apache recommends upgrading to 2.2.x.

Web Browsers

Table 2–10 shows the compatible Web browsers.

Table 2–10 Compatible Web Browsers (AIX)

Browser	Notes
Mozilla Firefox 3.0.1	NA

Linux

This section describes the primary software components compatible with a Linux implementation.

Operating Systems

Table 2–11 shows operating system compatibility for servers and clients:

Table 2–11 Operating System Versions (Linux)

Operating System	Notes
Oracle Linux 5 and higher 5.x updates	NA
RHEL5 and higher 5.x updates	NA
RHEL 6 update 3 and higher 6.x updates (with critical patch updates)	Support added in BRM 7.5 Patch Set 8.
Oracle Linux 6 update 3 and higher 6.x updates (with critical patch updates)	Support added in BRM 7.5 Patch Set 8.
RHEL 7 update 2 and higher 7.x updates (with critical patch updates)	Support added in BRM 7.5 Patch Set 15.
Oracle Linux 7 update 2 and higher 7.x updates (with critical patch updates)	Support added in BRM 7.5 Patch Set 15.

The following clients are supported on Linux:

- Developer Center
- Self-Care Manager

Compilers

Table 2–12 shows the supported compilers:

Table 2–12 Supported Compilers (Linux)

Compiler	Notes
gcc version 4.1.2	For Oracle Linux 5.8 and Red Hat 4.1.2-52
gcc version 4.4.7	For Oracle Linux 6.6 and 6.7 and Red Hat 4.4.7-16
gcc version 4.8.2	For Oracle Linux 7.0 and Red Hat 4.8.2-16
gcc version 4.8.3	For Oracle Linux 7.1 and Red Hat 4.8.3-9

Database Servers

Table 2–13 shows the compatible database servers:

Table 2–13 Compatible Database Servers (Linux)

Database Server Version	Notes
Oracle Database 10g (Oracle Enterprise)	NA

Table 2–13 (Cont.) Compatible Database Servers (Linux)

Database Server Version	Notes
Oracle Real Application Clusters 10g	Use Oracle Real Application Clusters 10g for high-availability configurations only. For scalability, use a multiscHEMA system. See "A BRM MultiscHEMA Production System" . BRM 7.5 supports AL32UTF8 as its default character set. It also continues to support the UTF8 character set for BRM installations that are being upgraded to BRM 7.5 from previous versions. The unicode character set AL32UTF8 is recommended for all new BRM 7.5 deployments.
Oracle Database 11g (Oracle 11.1.0.6 and later patch levels) (Oracle Enterprise)	NA
Oracle Real Application Clusters 11g R1	NA
Oracle Database 11g R2 (Enterprise Edition)	NA
Oracle Real Application Clusters 11g R2	NA
Oracle In-Memory Database (IMDB) Cache 11.2.2.2.0	NA
Oracle Clusterware 11g R1	NA
Oracle Database 12c R1 (Oracle 12.1.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 6.
Oracle Database 12c R1 Patch Set (Oracle 12.1.0.2.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 12.
Oracle Real Application Clusters 12c R1	Support added in BRM 7.5 Patch Set 12.
Oracle Database 12c R2 (Oracle 12.2.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 21.
Oracle Real Application Clusters 12c R2	Support added in BRM 7.5 Patch Set 21.
Oracle Database 18c R1 (Enterprise Edition)	Support added in BRM 7.5 Patch Set 23.
Oracle Real Application Clusters 18c R1	Support added in BRM 7.5 Patch Set 23.

Web Servers

[Table 2–14](#) shows the compatible Web servers:

Table 2–14 Compatible Web Servers (Linux)

Web Server	Notes
Apache 2.2.4	NA
Apache 2.2.6	NA

Web Browsers

Table 2–15 shows the compatible Web browsers.

Table 2–15 Compatible Web Browsers (Linux)

Browser	Notes
Mozilla Firefox 3.0.1	NA

HP-UX IA64

This section describes the primary software components compatible with an HP-UX IA64 implementation.

Note: Support added in BRM 7.5 Patch Set 5.

Operating Systems

Table 2–16 shows operating system compatibility for servers and clients:

Table 2–16 Operating System Compatibility (HP-UX IA64)

Operating System	Notes
HP-UX IA64 11i Version 3 (B.11.31)	NA

The following clients are supported on HP-UX IA64:

- Developer Center
- Self-Care Manager

Note: BRM can be customized on a 64-bit machine with the compiler's 32-bit flag set. This produces 32-bit code that runs on 32-bit and 64-bit machines.

Compilers

Table 2–17 shows the supported compilers:

Table 2–17 Supported Compilers (HP-UX IA64)

Compiler	Notes
aCC B3910B A.06.12 [Nov 03 2006]	NA
cc C/aC++ B3910B A.06.12 [Nov 03 2006]	NA

Database Servers

Table 2–18 shows the compatible database servers:

Table 2–18 Compatible Database Servers (HP-UX IA64)

Database Server Version	Notes
Oracle Database 10g R2 (Oracle 10.2.0.1 and later patch levels) (Enterprise Edition only)	NA
Oracle Real Application Clusters 10g	Use Oracle Real Application Clusters 10g for high-availability configurations only. For scalability, use a multiscHEMA system. See "A BRM MultiscHEMA Production System" . BRM 7.5 supports AL32UTF8 as its default character set. It also continues to support the UTF8 character set for BRM installations that are being upgraded to BRM 7.5 from previous versions. The unicode character set AL32UTF8 is recommended for all new BRM 7.5 deployments.
Oracle Database 11g (Oracle 11.1.0.6 and later patch levels) (Enterprise Edition only)	NA
Oracle Real Application Clusters 11g	NA
Oracle Database 12c R1 (Oracle 12.1.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 6.
Oracle Database 12c R1 Patch Set (Oracle 12.1.0.2.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 12.
Oracle Real Application Clusters 12c R1	Support added in BRM 7.5 Patch Set 12.
Oracle Database 12c R2 (Oracle 12.2.0.1.0) (Enterprise Edition)	Support added in BRM 7.5 Patch Set 21.
Oracle Real Application Clusters 12c R2	Support added in BRM 7.5 Patch Set 21.
Oracle Database 18c R1 (Enterprise Edition)	Support added in BRM 7.5 Patch Set 23.
Oracle Real Application Clusters 18c R1	Support added in BRM 7.5 Patch Set 23.

Windows

This section describes the primary software components compatible with a Windows implementation.

Operating Systems

Table 2–19 shows operating system compatibility for BRM clients:

Table 2–19 Operating System Compatibility (Windows)

Operating System	Notes
Windows XP SP3	NA
Windows Vista Business Type (32)	NA
Windows 7	NA
Windows 8.1 Enterprise	Support added in BRM 7.5 Patch Set 10.
Windows 10	Support added in BRM 7.5 Patch Set 22.

Compilers

Table 2–20 shows the supported compilers for client development:

Table 2–20 Supported Compilers (Windows)

Compiler	Notes
Microsoft Visual Studio .NET 13.10.3077	NA
Microsoft Visual Studio 2012 Update 4	Support added in BRM 7.5 Patch Set 7.

Web Browsers

Table 2–21 shows the compatible Web browsers.

Table 2–21 Compatible Web Browsers (Windows)

Browser	Notes
Microsoft Internet Explorer 8	Supported on Windows XP and Windows 7.
Microsoft Internet Explorer 11	Supported on Windows 7 and Windows 8.1. Support added in BRM 7.5 Patch Set 10. Only supported for Self-Care Manager.
Mozilla Firefox 32	Support added in BRM 7.5 Patch Set 10. Only supported for Self-Care Manager.

Other Compatible Software

Table 2–22 provides the compatibility information for other applications needed to create a complete customer management and billing system for your business:

Note:

- With BRM 7.5 Patch Set 10, the OpenSSL software is no longer part of the BRM patch set installation package. For BRM, Oracle recommends that you use the OpenSSL software bundled with the host operating system.
 - Taxware Manager is no longer part of the BRM installation package. BRM no longer supports an integration with Taxware.
-

Table 2–22 Third-Party Software Supported by BRM

Vendor	Software	Notes
AES	AES issue date: 29/07/2002	NA
Agentpp	Agentx++ version 1.4.14	NA
Agentpp	Agent++ version 3.5.26	NA
Agentpp	snmp++ version 3.2.20	NA
Apache Foundation	Axis2/Java 1.6.2	Support added in BRM 7.5 Patch Set 8. Note: BRM 7.5 does not support Apache Foundation Axis1 from Patch Set 8 onwards.
Apache Foundation	HttpComponents HttpClient 4.4	Support added in BRM 7.5 Patch Set 12.
Apache Foundation	HttpComponents HttpClient 4.5.3	Support added in BRM 7.5 Patch Set 19.
Apache Foundation	HttpComponents HttpClient 4.5.8	Support added in BRM 7.5 Patch Set 23.
Apache Foundation	Tomcat version 5.5.27	NA
Apache Foundation	Tomcat version 6.0.18	Servlet/JSP (2.5/2.1) JDK 1.5.0_09 Only supported for Self-Care Manager on Solaris.
Apache Foundation	Tomcat version 7.0.30	Support added in BRM 7.5 Patch Set 3. Only supported for Web Services Manager and Self-Care Manager.
Apache Foundation	Tomcat version 7.0.42	Support added in BRM 7.5 Patch Set 7. Only supported for Web Services Manager and Self-Care Manager.
Apache Foundation	Tomcat version 7.0.54	Support added for Web Services Manager in BRM 7.5 Patch Set 9.
Apache Foundation	Tomcat version 7.0.59	Support added for Web Services Manager in BRM 7.5 Patch Set 12.
Apache Foundation	Tomcat version 7.0.62	Support added for Web Services Manager in BRM 7.5 Patch Set 13.
Apache Foundation	Tomcat version 8.5.16	Support added for Web Services Manager in BRM 7.5 Patch Set 21.
Apache Foundation	Xerces-C++ 2.7.0	For all platforms.
Apache Foundation	Xerces-C++ 3.1.1	Support added in BRM 7.5 Patch Set 9.
Apache Foundation	Xerces-C++ 3.1.3	Support added in BRM 7.5 Patch Set 15.
Apache Foundation	Xerces-C++ 3.1.4	Support added in BRM 7.5 Patch Set 16.
Apache Foundation	Xerces-C++ 3.2.1	Support added in BRM 7.5 Patch Set 22.
Apache Foundation	Xerces-C++ 3.2.2	Support added in BRM 7.5 Patch Set 23.
Apache Foundation	Xalan-C++ 1.10	NA
Apache Foundation	Xalan-C++ 1.11	Support added in BRM 7.5 Patch Set 9. Note: BRM 7.5 does not support Xalan-C++ from BRM 7.5 Patch Set 21 onwards.
Apache Foundation	Xalan-Java 2.7.1	NA

Table 2–22 (Cont.) Third-Party Software Supported by BRM

Vendor	Software	Notes
Apache Foundation	Xalan-Java 2.7.2	Support added in BRM 7.5 Patch Set 16. Note: BRM 7.5 does not support Xalan-Java from BRM 7.5 Patch Set 21 onwards.
Apache Foundation	Xerces-J (Java) 2.6.2	NA
Apache Foundation	Xerces-J (Java) 2.9.1	Only JCA Resource Adapter uses Xerces version 2.9.1.
Apache Foundation	Xerces-J (Java) 2.11.0	Support added in BRM 7.5 Patch Set 9.
Apache Foundation	Xerces-J (Java) 2.12.0	Support added in BRM 7.5 Patch Set 22.
Borland	JBuilder 2008 Release 2	NA
HP	Java JDK/JRE 7.0.05	Supported only on HP-UX IA64.
IBM	Rational Purify 7.0.0.0_0.12	NA
Install Shield	Install Shield Multi-Platform 5.0.2	NA
Install Shield	Install Shield Multi-Platform 5.5	NA
LDAP	Netscape LDAP 5.0	Support removed in BRM 7.5 Patch Set 16.
LDAP	Netscape LDAP 5.5	Support removed in BRM 7.5 Patch Set 16.
LDAP	Netscape LDAP 6.1	Support removed in BRM 7.5 Patch Set 16.
LDAP	Oracle Unified Directory 11.1.2.3.0	Support added in BRM 7.5 Patch Set 16.
OpenSSL Project	OpenSSL 1.0.0a	NA
OpenSSL Project	OpenSSL 1.0.1g	Support added in BRM 7.5 Patch Set 8.
Oracle	Application Integration Architecture for Communications 2.4	NA
Oracle	Application Integration Architecture for Communications 2.5.1	NA
Oracle	Application Integration Architecture for Communications 11.1	NA
Oracle	Application Integration Architecture for Communications 11.2	NA
Oracle	Application Integration Architecture for Communications 11.3	Support added in BRM 7.5 Patch Set 3.
Oracle	Business Intelligence Publisher 10.1.3.4	Only supported for reports. BRM and BI Publisher invoicing integration is certified only on the OC4J 10.1.3.x application server on Windows and Linux.
Oracle	Business Intelligence Publisher 10.2.0.5	Only supported for AMP.

Table 2–22 (Cont.) Third-Party Software Supported by BRM

Vendor	Software	Notes
Oracle	Business Intelligence Publisher 11.1.1.7 (with critical patch updates)	<p>Support added in BRM 7.5 Patch Set 4 on Solaris, AIX, and Linux.</p> <p>Support added in BRM 7.5 Patch Set 5 on HP-UX IA64.</p> <p>You must install BRM 7.5 Patch Set 4 or later to use BRM reports with BI Publisher 11g with the mandatory Oracle Business Intelligence Enterprise Edition Suite Patch 11.1.1.7.150120 or a later patch.</p> <p>Note: Running reports and generating invoices with BI Publisher 11g running on Windows is not supported.</p>
Oracle	Business Intelligence Publisher 11.1.1.9 (with critical patch updates)	<p>Support added in BRM 7.5 Patch Set 15 on Solaris, AIX, Linux, and HP-UX IA64.</p> <p>Note: Running reports and generating invoices with BI Publisher 11g running on Windows is not supported.</p>
Oracle	Business Intelligence Publisher 12c (with critical patch updates)	<p>Support added in BRM 7.5 Patch Set 23 on Solaris, AIX, Linux, and HP-UX IA64.</p> <p>Note: Running reports and generating invoices with BI Publisher 11g running on Windows is not supported.</p>
Oracle	Java JDK 1.6.0_26	Supported only on Windows, Solaris, Linux, and AIX.
Oracle	Java JRE 1.6.0_26	Supported only on Windows, Solaris, Linux, and AIX.
Oracle	Java JRE 1.7.0_13	Support added in BRM 7.5 Patch Set 5 on Windows, Solaris, Linux, and AIX. JRE 1.7.0_13 is certified with BRM 7.5 Patch Set 5 and later patch sets. You cannot have JRE 1.7.0_13 preinstalled during the installation of base BRM 7.5 software.
Oracle	Java JRE 1.8.0_45	<p>Note: Running reports and generating invoices using BI Publisher 11g with JRE 1.8 is not supported.</p> <p>You cannot have JRE 1.8 preinstalled during the installation of base BRM 7.5 software.</p>
Oracle	Java JRE 1.8.0_201	<p>Note: Running reports and generating invoices using BI Publisher 11g with JRE 1.8 is not supported.</p> <p>You cannot have JRE 1.8 preinstalled during the installation of base BRM 7.5 software.</p>
Oracle	Oracle GlassFish Server 3.1	NA
Oracle	Oracle GlassFish Server 3.1.2.2	Support added in BRM 7.5 Patch Set 12.
Oracle	Oracle Help for Java 5	NA
Oracle	Remote Diagnostic Agent (RDA) 4.24	NA

Table 2–22 (Cont.) Third-Party Software Supported by BRM

Vendor	Software	Notes
Oracle	RDA 8.03	Support added in BRM 7.5 Patch Set 8 on Solaris and Linux. Support added in BRM 7.5 Patch Set 9 on AIX and HP-UX IA64.
Oracle	WebLogic Server Version 9.1	WebLogic Server 9.1 is supported only for Self-Care Manager.
Oracle	WebLogic Server Version 10.3	WebLogic Server 10.3 is supported for JCA Resource Adapter and Web Services Manager.
Oracle	WebLogic Server Version 12.1.1	Support added for JCA Resource Adapter in BRM 7.5 Maintenance Patch Set 1.
Oracle	WebLogic Server Version 12.1.3	Support added in BRM 7.5 Patch Set 14 for JCA Resource Adapter and Web Services Manager.
Oracle	WebLogic Server Version 12.2.1	Support added in BRM 7.5 Patch Set 16 for Web Services Manager.
Paymentech	120 Byte Batch Version 3.0.0 R 4.2	Requires Paymentech Manager.
Paymentech	Online Authorization Version 7.4 R3	Requires Paymentech Manager.
Perl	Perl 5.8.0	Not supported from BRM 7.5 Patch Set 8 and later.
Perl	Perl 5.18.2	Support added in BRM 7.5 Patch Set 8 on Solaris and Linux. Support added in BRM 7.5 Patch Set 9 on AIX and HP-UX IA64. Not supported from BRM 7.5 Patch Set 18.
Perl	Perl 5.24.0	Support added in BRM 7.5 Patch Set 18. Not supported from BRM 7.5 Patch Set 21.
Perl	Perl 5.26.1	Support added in BRM 7.5 Patch Set 21.
Perl	Perl 5.28.1	Support added in BRM 7.5 Patch Set 22.
RIVERACE	ACE 6.4.3	NA
Roaming Standard	TAP 3.11.13	NA
Roaming Standard	TAP 3.12	Support added in BRM 7.5 Patch Set 3.
Roaming Standard	TAP 3.12 (TD57 version 32.1)	Support added in BRM 7.5 Patch Set 8.
Roaming Standard	RAP 1.4	NA
Roaming Standard	RAP 1.5	Support added in BRM 7.5 Patch Set 2.
Roaming Standard	RAP 1.6 (TD32 version 6.11)	Support added in BRM 7.5 Patch Set 8.
Roaming Standard	CIBER 2.5	NA
Rogue Wave	SourcePro C++ 11.1	NA
Rogue Wave	Stingray Studio 7.1	NA
Rogue Wave	Stingray Studio 11.1	Support added in BRM 7.5 Patch Set 8.
Vertex Communications Tax Q Series	CTQ 3.0	Support added in BRM 7.5 Patch Set 20. Support continued for CTQ 1.00.13, CTQ 1.01.06, and CTQ 2.00.05.

Table 2–22 (Cont.) Third-Party Software Supported by BRM

Vendor	Software	Notes
Vertex Communications Tax Q Series	CTQ 3.00.02	Support added in BRM 7.5 Patch Set 22. Support continued for CTQ 1.00.13, CTQ 1.01.06, CTQ 2.00.05, and CTQ 3.0.
Vertex Sales Tax Q Series	STQ 4.0.6	Support continued for STQ 3.1.6 and STQ 3.2.21. HP-UX IA64 is supported with the ISAM database.
Vertex Sales Tax Q Series	STQ 5.0	Support added in BRM 7.5 Patch Set 22. Support continued for STQ 3.1.6, STQ 3.2.21, and STQ 4.0.6. HP-UX IA64 is supported with the ISAM database.
Webstart	1.6	NA

Database Configuration and Tuning

This chapter provides database configuration guidelines for configuring your Oracle Communications Billing and Revenue Management (BRM) database.

For information on installing BRM, see ["BRM Installation Overview"](#).

Generic Database Configuration

The basic tasks involved in creating a BRM database are the following:

- [Selecting the Storage Device Type](#)
- [Estimating the Database Size](#)
- [Assigning Disks for the Operating System and for BRM](#)
- [Assigning Storage for Log Files, Rollback Segments, and Temporary Storage](#)
- [Selecting the Storage Model](#)
- [Creating Tablespace Storage](#)
- [Mapping Tablespaces to Logical Devices](#)
- [Creating Tablespaces](#)
- [Running Configuration Scripts to Create the BRM Database](#)

Selecting the Storage Device Type

Databases can be stored in raw devices (partitions) or files. Raw devices provide the best performance for most workloads, but file systems are easier to administer because of the availability of system administration utilities. However, depending on your system, the performance when using files can be almost equal to the performance when using raw partitions. For example, this is true of some disk arrays that are available.

In general, databases are stored in raw partitions on large systems.

Estimating the Database Size

The objects that require the most storage space in a default BRM installation are accounts, bills, and events. The tables that correspond to these objects are also the ones with the most activity:

- ACCOUNT_T
- ACCOUNT_BALANCE_T

- ACCOUNT_NAMEINFO_T
- PURCHASED_PRODUCTS_T
- BILL_T
- EVENT_T
- EVENT_TOTAL_T
- EVENT_BAL_IMPACTS_T
- ITEM_T

Service objects also require a lot of storage:

- SERVICE_T

Your customizations might create additional large tables. For example, if you store a lot of account profile data, you must account for data in the ACCOUNT_PROFILES_T table.

Your estimate should not include space gained by archiving.

It takes about 17 to 18 GB of disk space for one million accounts. Activities such as billing, invoicing, and rating result in the most disk space used.

International Version Sizing Considerations

English databases store VARCHARs as one byte per character. Localized versions of BRM can store these strings in AL32UTF8 or UTF8 format. BRM 7.5 uses the AL32UTF8 character set. Character strings such as names, addresses, descriptions, and notes that can be manipulated by BRM GUI tools can vary in size. To size the database, you must determine roughly what percentage of the database consists of strings that can vary in size.

Assigning Disks for the Operating System and for BRM

Allocate separate disks for the BRM software, operating system, and operating system SWAP space. These disks should not be used for any other purpose.

Assigning Storage for Log Files, Rollback Segments, and Temporary Storage

Use separate disks for redo log files, rollback segments, and temporary space. Do not use the disks for any other purpose.

The redo, rollback, and temporary storage database objects are not created or modified by the BRM configuration scripts. Use a separate script to create these objects.

To determine the amount of storage that is used for redo logs, rollback segments, and temporary space, use the following guidelines.

Assigning Storage for Redo Log Files

The redo log files are the most heavily used objects in the database system. You usually create two redo logs.

The redo log files should be large enough to avoid excessive switching between log files. Each switch triggers a checkpoint, which slows performance. For most implementations, the size of each redo log file should be 1 to 5 GB.

If you are not using database archiving, you can put both redo logs on one disk. If you are using archiving, you should use at least two redo logs, on separate disks. When

archiving, the redo log files should be large enough to enable each redo log file to be fully archived before it has to be active. You can increase the number of redo log files to allow enough space for archiving.

Assigning Storage for Rollback Segments

Rollback segments are the second-most used objects in Oracle databases. All rollback segments can be in a single tablespace. The number of rollback segments should be approximately equal to the number of Data Manager (DM) back ends.

To prevent the growing and shrinking of rollback statements, use the following declaration:

```
SQL> init 256K next 256K minextents 20 optimal 5120K
```

Assigning Storage for Temporary Storage

Temporary storage should be three to four times the size of the largest table (usually EVENT_T). In most cases, 1 GB is enough, since simulation programs and BRM do not sort this table.

Note: By default, temporary storage is **TEMP**.

Selecting the Storage Model

Choose a storage model based on the total size of your database, which you can determine by summing your data, index, rollback, and temporary tablespaces.

- Use **Test** for test or demonstration databases smaller than 700 MB.
- Use **Small** for test or demonstration databases smaller than 1.5 GB.
- Use **Medium** for databases smaller than 30 GB.
- Use **Large** for databases larger than 30 GB.

You set the storage option at installation by editing the **pin_setup.values** file. See ["Installing BRM"](#).

During installation, BRM tables are created using one of the storage models. Therefore, the default storage clause is not used at installation. (The default storage clause specifies the storage parameters to use if no storage clause is provided.) However, if you create custom tables, you must specify a storage clause, or else the default storage clause is used.

Creating Tablespace Storage

Tablespace storage is created from physical disks, however, the unit of storage assigned to a tablespace is a logical device (also called a logical drive or volume). A logical device can be an entire disk, a set of disks, or part of a disk.

You usually use a volume manager, a hardware-specific utility, or a hardware-level RAID manager to create logical devices. (Use either a volume manager or a RAID manager, but not both.) A disadvantage with using a RAID solution is the lack of controller redundancy.

There are various types of logical devices, for example, striped (RAID0), RAID1, and RAID5. Which one you choose depends on requirements for performance, availability, and price:

- RAID0 has the best performance and price, but provides no fault tolerance.

- RAID1 and RAID5 provide increased availability, but with reduced performance, especially for write operations.
- RAID0+1 provides the performance advantage of striping, and the availability of mirroring. However, the cost is higher because you use twice as much disk space.

Before determining the number of tablespaces and how to assign them to logical devices, determine the number of available logical devices.

The number of logical devices that can be created on a UNIX system depends on the number and size of stripes used to construct each logical device. Each logical device is normally constructed from several 32 KB or 64 KB stripes made over four to seven physical disks using a volume manager. Each logical device consists of multiple stripes over the same set of disks. One or more logical devices can be created on one set of disks. Fewer than four disks might be used in small- or medium-sized databases.

For best performance:

- Assign all logical devices created over the same set of disks to the same tablespace.
- Each logical device should be on independent disks and controller, usually 6 to 14 disks per controller. Only three or four disks per tablespace would still be a good configuration.

Indexes occupy approximately one third of the space required by the database. A good initial size for a tablespace is 2 GB. Logical devices can then be added in 2 GB or larger increments. Logical devices smaller than 2 GB can lead to reduced performance due to maintenance overhead, although they may be required in smaller databases where the number of available disks is limited. The ability to create logical devices larger than 2 GB depends on disk size and number of disks.

If possible, create very large (10 GB) initial tablespaces instead of small (less than 2 GB) tablespaces. Use the Tables Sheet and Indexes Sheet to determine the size of these initial tablespaces.

From the **pin_tables.values** file, determine which tables map to which tablespaces. Then sum the storage required for the tablespace. This can be done for the larger tables and tablespaces. The smaller tablespaces do not need more than a few Gigabytes for their initial storage. See "[Tablespace Priorities](#)".

The size of the database, in turn, determines the minimum number of disks required for the database. Remember to consider disk space required for other purposes, for example, the operating system, BRM, log files, temporary storage, and swap files.

You should have enough disks to avoid performance bottlenecks. In addition, you can increase performance by spreading the most-used tables over multiple disks.

Note: You can add disks and logical devices at any time after BRM has been installed.

After determining the number of disks available for the database, divide the tablespaces among those disks.

Half the remaining space will be used for mirroring. Put mirrors on different disks than their corresponding tables and indexes. The number of mirror logical devices will be equal, in number and size, to their corresponding table and index logical devices.

After allocating disk space for mirrors, divide the remaining disk space using the ratio of 2:1 between tables and indexes. That is, two-thirds of the space will be used for table logical devices and one-third of the space will be used for index logical devices.

Note: The logical devices may not be the same size, because some tablespaces will be more active than others. See "[Tablespace Priorities](#)".

Create the logical devices over the remaining physical disks using the above guidelines. The next step is mapping tablespaces to logical devices.

Mapping Tablespaces to Logical Devices

Logical-to-physical table and index mapping is defined in the *BRM_Home/setup/scripts/pin_tables.values* file. This file lists 36 logical tablespaces for indexes and 36 logical tablespaces for data.

In the default BRM installation, all 72 BRM logical tablespaces map to two separate physical tablespaces: one for all the tables (\$PIN_CONF_DM_DB_TABLES_GROUP) and one for all the indexes (\$PIN_CONF_DM_DB_INDEX_GROUP). When you install BRM, the physical tablespace names PIN00 and PINX00 are substituted for the configuration variable names in the file.

The default logical-to-physical tablespace mappings defined in the *pin_tables.values* file are:

Default Tablespaces for Data

```
$PIN_CONF_TBLSPACE0="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE1="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE2="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE3="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE4="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE5="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE6="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE7="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE8="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE9="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE10="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE11="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE12="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE13="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE14="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE15="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE16="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE17="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE18="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE19="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE20="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE21="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE22="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE23="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE24="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE25="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE26="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE27="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE28="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE29="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE30="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE31="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE32="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE33="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE34="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
```

```
$PIN_CONF_TBLSPACE35="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE36="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
```

Default Tablespaces for Indexes

Note: You can customize the tablespaces to improve performance.

```
$PIN_CONF_TBLSPACE0="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE1="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE2="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE3="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE4="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE5="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE6="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE7="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE8="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE9="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE10="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE11="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE12="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE13="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE14="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE15="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACE16="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE17="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE18="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE19="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE20="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE21="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE22="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE23="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE24="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE25="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE26="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE27="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE28="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE29="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE30="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE31="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE32="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE33="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE34="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE35="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE36="$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
```

To map logical and physical devices, you modify the entries in the right-hand column. You can edit the file before or after creating the logical devices, however, you must create logical and physical tablespaces before running the **pin_setup** script that uses the values in the **pin_tables.values** file.

Tablespace Priorities

BRM tablespaces are ranked according to highest level of activity. [Table 3–1](#) shows the default priority:

Table 3–1 Tablespace Priorities

Priority	Table	Index
1	tablespace5	tablespacex15
2	tablespace0	tablespacex14
3	tablespace15	tablespacex1
4	tablespace1	tablespacex0
5	tablespace6	tablespacex7
6	tablespace2	tablespacex11
7	tablespace3	tablespacex5
8	tablespace7	tablespacex12
9	tablespace4	tablespacex9
10	tablespace8	tablespacex6
11	tablespace14	tablespacex13
12	tablespace13	tablespacex2
13	tablespace12	tablespacex3
14	tablespace10	tablespacex10
15	tablespace11	tablespacex4
16	tablespace9	tablespacex8

In most cases you should not change table to tablespace mappings. Instead, change the tablespace priorities, the number of logical priorities, or both. Your goal should be to maintain the best performance based on your customizations and customer usage patterns.

To change table-to-tablespace mapping, use the same tablespace for tables whose sizes are a function of different parameters. In this way, tables grow at different rates, resulting in more efficient space allocation within one tablespace. If tablespaces are not large enough, they fill up and an error is returned to BRM. This usually happens with the event tables first.

For best results, 36 tablespaces have been provided for data and another 36 tablespaces for indexes in the **pin_tables.values** file. Depending on your installation size, available hardware, and the functionality you are implementing, such as using the Rated Event (RE) Loader, some or all of these tablespaces might be used for database. BRM recommends the use of at least 18 tablespaces for data and another 16 for indexes.

Important: If you are using RE Loader, you may need additional tablespaces for related tables.

If there are fewer than 72 logical devices, you can choose your own method to map the logical tablespaces to the smaller number of physical tablespaces. For example, you can allocate a few physical tablespaces to the highest-priority logical tablespaces, and allocate the remaining logical tablespaces using round-robin. Or, you can simply map all tablespaces using round-robin.

For example, assume that you have 6 logical devices for tables, and 4 logical devices for indexes. These 10 logical devices are mapped to 10 physical tablespaces. The two highest priority tablespaces are mapped to their own physical tablespaces, using the

priorities defined in the priority table. The remaining 30 logical tablespaces are then mapped to the remaining tablespaces using round-robin. To do this, first assign the physical tablespace to the physical tablespace configuration variable:

```
#=====
# default tablespace or filegroup names
#=====
$PIN_CONF_DM_DB_TABLES_GROUP = "pin00";
$PIN_CONF_DM_DB_TABLES_GROUP1 = "pin01";
$PIN_CONF_DM_DB_TABLES_GROUP2 = "pin02";
$PIN_CONF_DM_DB_TABLES_GROUP3 = "pin03";
$PIN_CONF_DM_DB_TABLES_GROUP4 = "pin04";
$PIN_CONF_DM_DB_TABLES_GROUP5 = "pin05";
$PIN_CONF_DM_DB_INDEX_GROUP = "pinx00";
$PIN_CONF_DM_DB_INDEX_GROUP1 = "pinx01";
$PIN_CONF_DM_DB_INDEX_GROUP2 = "pinx02";
$PIN_CONF_DM_DB_INDEX_GROUP3 = "pinx03";
```

Then change the default logical tablespace to physical tablespace mapping as follows, using the priority table:

For Data

```
$PIN_CONF_TBLSPACE0 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP1";
$PIN_CONF_TBLSPACE1 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP3";
$PIN_CONF_TBLSPACE2 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP5";
$PIN_CONF_TBLSPACE3 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP2";
$PIN_CONF_TBLSPACE4 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP4";
$PIN_CONF_TBLSPACE5 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP";
$PIN_CONF_TBLSPACE6 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP4";
$PIN_CONF_TBLSPACE7 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP3";
$PIN_CONF_TBLSPACE8 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP5";
$PIN_CONF_TBLSPACE9 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP3";
$PIN_CONF_TBLSPACE10 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP5";
$PIN_CONF_TBLSPACE11 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP2";
$PIN_CONF_TBLSPACE12 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP4";
$PIN_CONF_TBLSPACE13 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP3";
$PIN_CONF_TBLSPACE14 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP2";
$PIN_CONF_TBLSPACE15 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_TABLES_GROUP2";
...
...
```

For Indexes

```
$PIN_CONF_TBLSPACEX0 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP3";
$PIN_CONF_TBLSPACEX1 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP2";
$PIN_CONF_TBLSPACEX2 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP3";
$PIN_CONF_TBLSPACEX3 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACEX4 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP2";
$PIN_CONF_TBLSPACEX5 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP2";
$PIN_CONF_TBLSPACEX6 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP1";
$PIN_CONF_TBLSPACEX7 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACEX8 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP3";
$PIN_CONF_TBLSPACEX9 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
$PIN_CONF_TBLSPACEX10 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP1";
$PIN_CONF_TBLSPACEX11 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP1";
$PIN_CONF_TBLSPACEX12 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP3";
$PIN_CONF_TBLSPACEX13 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP2";
$PIN_CONF_TBLSPACEX14 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP1";
$PIN_CONF_TBLSPACEX15 = "$PIN_CONF_TABLESPACE_ID $PIN_CONF_DM_DB_INDEX_GROUP";
...
...
```

...

The details on changing configuration variables in the configuration scripts can be found in the comments in those scripts.

In test installations, where the total number of disks is constrained on the database server, it is often easier to configure a single tablespace or file group for data (PIN00) and one for indexes (PINX00). For example, if a database system has 12 physical drives available for data and indexes, you could configure the database as follows:

- Create 3 logical volumes (E:, F:, G:) of 4 striped drives
- Create the data tablespace PIN00 using a data file on E: and F:
- Create the index tablespace PINX00 using a data file on G:
- Map all the \$PIN_CONF_TBLSPACE* entries to PIN00 and all the \$PIN_CONF_TBLSPACEX* entries to PINX00

Since there are not enough disks to practically separate tablespaces into distinct logical volumes, it makes sense from a performance perspective to manage just 2 tablespaces. This way the operating system will manage the underlying parallel I/O operations.

Be sure to assign custom tables (new tables created for new objects that are not part of the default BRM installation) to explicit tablespaces. These can be new tablespaces that you create or existing ones. If you do not make a tablespace assignment for these tables, the new tables will go into a default tablespace which may cause performance or storage problems as the new tables grow or are accessed.

Creating Tablespaces

Create the actual tablespaces before running the **pin_setup** configuration script since they require existing tablespaces. Only the two default tablespaces must be created if you have not edited the **pin_tables.values** file to assign tables to nondefault tablespaces.

Running Configuration Scripts to Create the BRM Database

See ["Installing and Configuring the Oracle Database"](#) for information about creating the BRM database.

Configuring Oracle Databases

For information about configuring the Oracle database, see the Oracle documentation. To increase performance, experiment with database configuration options (for example, increase the number of processes, rollbacks, shared pool size, index space, shared memory, and buffers).

Examine the **init.ora** parameters in TPC-C full disclosure reports for your hardware platform. Compare those parameters with your installation. Understand why the examples might be different than your values, and experiment with different values.

[Table 3–2](#) provides guidelines for some Oracle and operating system configuration options.

Table 3–2 Configuration Options for Operating Systems

Configuration Options	Guidelines
_b_tree_bitmap_plans	Set to FALSE for all BRM system configurations. This improves BRM database performance.
disk_async_io	Set to TRUE to enable asynchronous database updates. Using async I/O means that you only have one dbwriter process.
block_size	Use a minimum 8KB block size for the database.
cursor_space_for_time	Set to TRUE to increase performance, although this uses slightly more disk space in the SGA.
db_block_buffers shared_pool_size	<p>In general, the size of the SGA should be less than or equal to one-half of real memory. The two major components of the SGA are shared_pool_size and db_block_buffers. In other words, the SGA in bytes is roughly equal to $(\text{shared_pool_size} + (\text{db_block_buffers} * \text{db_block_size}))$.</p> <p>Set the shared_pool_size to approximately 10 to 12 MB. On larger systems, you can set it to be twice as large. To find the optimal value for db_block_buffers, divide the size of available shared memory minus shared_pool_size by db_block_size.</p> <p>The amount of RAM available on the database server sets an upper bound on the size of the SGA. The SGA should be roughly one-half the available RAM. SGAs can be up to 2 GB for large installations. The number of buffers (db_block_buffers) can be up to approximately 300000 on large installations.</p> <p>Sample value setting for the db_block_buffers parameter: 340000.</p> <p>Sample value setting for the shared_pool_size parameter: 30000000.</p>
db_writer_processes	You can improve I/O performance by increasing the number of DB writer processes from the default, single process. Setting db_writer_processes between 5 and 10 (for the largest systems) can improve I/O throughput. If db_writer_processes is set, dbwr_io_slaves must not be specified.
DML locks	<p>Use 5000 for DML locks for very heavy workloads.</p> <p>Sample value setting for the dml_locks parameter: 5000.</p>
freelist and pctfree	Consider creating tablespaces with additional room for inserting. The storage parameters are pctfree and freelist. Although using freelists requires more disk and memory, insert speed is greatly enhanced. The default is 1. The most active tables should be in tablespaces with at least 10 – 20 freelists, depending on the size of the installation.
log_buffer	<p>Set the log_buffer option to approximately 2 MB.</p> <p>Sample value setting for the log_buffer parameter: 2621440.</p>
log_checkpoint_interval	Make the log_checkpoint_interval higher for performance and lower for recoverability. The log_checkpoint_interval should be set to 3600 for small workloads. A much larger number should be used for large configurations. The performance impact for checkpointing can be up to 20%.
logfile	Set the size of the logfile parameter to be between 1 and 5 GB for better performance. Configure at least two log groups and put them on the fastest disks in the system.

Table 3–2 (Cont.) Configuration Options for Operating Systems

Configuration Options	Guidelines
open_cursors	<p>A minimum number for open_cursors is 1080. There is no penalty, however, for having this parameter set to a high value.</p> <p>Set open_cursors to match the value of the stmt_cache_entries entry in the DM Oracle configuration (pin.conf) file. If using a statement cache size of 1080, for example, the stmt_cache_entries entry appears as follows in the DM pin.conf file:</p> <pre>- dm stmt_cache_entries -1080</pre> <p>The statement-handle caching performance feature requires a large number of open_cursors. Increase the open_cursors parameter to 4192 by adding the following line to the initSID.ora file.</p> <pre>open_cursors = 4192 (minimum value: statement cache size + number of dm_backends)</pre>
rollback segments	The ratio of shadow processes to rollback segments should be approximately the same. For example, if you use 142 shadow processes, you should create approximately 142 rollback segments. The number of shadow processes is the same as the number of DM back end processes. Because of the way BRM can multiplex client requests in the DMs, the client load on the database is usually under or close to 100, even on large installations.
session_cached_cursors	Set the session_cached_cursors option to a nonzero value to enable the database to maintain cursors used in the repeated parsing of SQL statements. Use 150 as a starting point.
shared pool size	Shared pool size should be close to 10000000 for high hit ratios. Twice this can be used on large installations.
db_files	Sample value setting for the db_files parameter: 300 to 1020 .
max_rollback_segments	Sample value setting for the max_rollback_segments parameter: 200 .
processes	Sample value setting for the processes parameter: 320 .
db_block_size	Sample value setting for the db_block_size parameter: 4096 .

The **shared_pool_size** is not the size of available shared memory. The SGA mainly consists of two pools (**shared_pool_size** and **db_block_buffers**) whose combined size is roughly the size of the SGA. The size of shared memory should be bigger than the result of the following formula:

$$\text{shared_pool_size} + (\text{db_block_buffer} * \text{db_block_size})$$

Example of a Large-Scale Oracle Installation

Table 3–3 shows the tablespace mapping to physical array groups for a large-scale Oracle installation.

Table 3–3 Tablespace Mapping to Physical Array Groups

Tablespace Name	Array Group (LUN)	Storage Size
PIN05	\$c0d1	20G
PIN00	\$c1d2	20G
PIN15	\$c2d1	20G
PIN01	\$c3d1	20G
PIN06	\$c0d3	15G
PIN02	\$c1d4	15G

Table 3–3 (Cont.) Tablespace Mapping to Physical Array Groups

Tablespace Name	Array Group (LUN)	Storage Size
PIN03	\$c2d3	15G
PIN07	\$c3d3	15G
PIN04	\$c0d5	15G
PIN08	\$c1d6	15G
PIN14	\$c2d5	15G
PIN13	\$c3d5	15G
PIN12	\$c0d7	15G
PIN10	\$c1d8	15G
PIN11	\$c2d7	15G
PIN09	\$c3d7	15G
PINX15	\$c0d9	10G
PINX14	\$c1d10	10G
PINX01	\$c2d9	10G
PINX00	\$c3d9	10G
PINX07	\$c0d11	10G
PINX11	\$c1d12	10G
PINX05	\$c2d11	10G
PINX12	\$c3d11	10G
PINX09	\$c0d13	10G
PINX06	\$c1d14	10G
PINX13	\$c2d13	10G
PINX02	\$c3d13	10G
PINX03	\$c0d15	10G
PINX10	\$c1d0	10G
PINX04	\$c2d15	10G
PINX08	\$c3d15	10G
RBS00	\$c4d0	10G
RBS01	\$c4d2	10G
REDO_LOGS1	\$c5d0 10G	NA
REDO_LOGS2	\$c5d2 10G	NA
SYSTEM	\$c5d4	1G
TEMP	\$c5d6	10G

Using Rule-Based Optimization versus Cost-Based Optimization

If you have *not* partitioned any tables in your BRM database, you can use rule-based optimization or cost-based optimization. If you have partitioned tables, you can use only cost-based optimization.

BRM indexes are designed to work best when you use rule-based optimization. To specify rule-based optimization, enter this line in the **init.ora** initialization file:

```
OPTIMIZER_RULE=RULE
```

The alternative to using rule-based optimization is using CHOOSE optimization. This is the default optimization method. It requires some initialization and maintenance to achieve consistently high performance.

Setting **OPTIMIZER_RULE=CHOOSE** in the **init.ora** file forces Oracle to use a cost-based optimization algorithm when tables in the query have statistics and the rule-based optimization when they do not. Cost-based optimization uses the actual relationship between data. To support cost-based optimization (which can be enabled by specifying HINTs in the query or running **ANALYZE** on a table), statistics must be updated by analyzing the actual data in the tables. This operation can take a long time on large tables, such as event tables. Cost-based optimization is used when an SQL statement accesses partitioned tables or indexes; rule-based optimization is not available for partitioned tables and indexes.

In addition, using **ANALYZE** requires table statistics to be periodically updated. Unless this occurs, the optimizer can choose a poorly performing access path, even though an index exists. In other words, the optimizer could actually skip an index if statistics are not updated

Important: After **ANALYZE** has been run on a table or set of tables, cost-based optimization is used. If the statistics are not kept up to date, the optimizer may not choose the best access plan and performance will be impacted.

About Oracle Parallel Server

Oracle Parallel Server (OPS) is a version of Oracle that runs on a cluster. A single database is accessed through multiple host systems, each of which is running its own instance of Oracle. This configuration can be used for high availability or performance. This configuration is not necessarily the best configuration for high availability because other solutions based on a cluster and a single Oracle instance are easier to install and administer. With strong DBA expertise, however, OPS might be an option. If OPS is used, single active instance (primary node/backup node) mode is recommend.

From a performance standpoint, an OPS configuration is not recommended for BRM installations where write workloads predominate. An OPS installation can get much better performance than a single instance on read-only or read-mostly workloads such as basic authentication and authorization or basic customer service representative (CSR) operations. However, performance for write workloads, like event processing, is only slightly better than it is on a single instance. For increased performance and scalability, consider using a multischema system. See "[A BRM Multischema Production System](#)".

About Using Virtual Columns

Oracle Database 11g, by default, supports virtual columns (columns whose values are defined by an expression, are computed when you query the data, and are not physically stored in the database). You can use virtual columns in the BRM database if you have Oracle Database 11g (or later).

Implementations of BRM have shown that a high percentage of the BRM database storage space can be used by the event tables. BRM can use virtual columns in a way that results in space savings for event records. To enable virtual columns in the BRM database, you convert event classes (**/event** and its subclasses) in the BRM schema. The savings in database storage applies to event data that the system creates *after* the virtual columns are generated (not to existing event data). Virtual column functionality is transparent to BRM.

For information about virtual columns in general, see the Oracle Database documentation.

For information on generating virtual columns on BRM event tables, see the discussion on enabling virtual columns in *BRM System Administrator's Guide*.

Maintaining a BRM Database

You monitor and maintain the BRM database with standard database tools. For example, you can set up your database software to generate log files. For more information, see the documentation for your database software.

You can also use the **sar** utility to monitor performance.

Important: Do not use SQL statements to insert, delete, or update BRM tables or objects. Always use the Portal Communications Module (PCM) interface, which guarantees the integrity of the BRM database.

For information about managing a multischema system, see "Managing a Multischema System" in *BRM System Administrator's Guide*.

Maintaining the Connection to the Database

If the connection to the database fails, BRM automatically attempts to reconnect, using the database name listed in the configuration file for the DM. If BRM can reestablish the connection, BRM generally restarts the operation. If BRM was in the middle of a transaction, BRM reports a **PIN_ERR_STORAGE** error in the log file for the DM. If BRM cannot reestablish the connection, it reports a **PIN_ERR_STORAGE_DISCONNECT** error.

If BRM is running on an OPS to increase fault tolerance, the OPS database appears to a DM to be multiple logical databases, each with a different host name, or SID. For the DM to be able to reconnect to a surviving host after a failure of one host, you must configure the DM to look for all hosts in an OPS system:

1. Open the DM configuration file (*BRM_Home/sys/dm_oracle/pin.conf*).
2. For each host in the OPS system, add an **sm_database** configuration entry below the existing entry.

See the guidelines for that entry in the configuration file.

3. Stop and restart the DM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

The DM looks for OPS hosts in the order in which they appear in the configuration file.

For more information on failure recovery, see "Four-Tier Architecture and Failure Recovery" in *BRM Concepts*.

Scheduling Backups

You should back up the database every night. You can choose a backup solution from your database manufacturer or from a third party.

To keep your database always running, ready to respond to real-time events, use the database online backup utilities for routine backups.

You should also back up your system files (programs, scripts, source code, and documentation) and your data files and keep the backups in a secure, offsite location. To be safe, you should keep at least three iterations of your system backups and at least one month's worth of daily backups. Storage media are usually less expensive than customer problems.

Verify the data and system backup files to ensure that you can recover the data. At times, this secondary system can also serve as a fully functional test system. If BRM releases a patch that can significantly affect your installation, it is important to try it on a test system before installing it in your production system.

Important: The only way to verify the data and system backup files is to restore them to another location to ensure that there are no errors in reading, writing, or formatting.

Monitoring Database Space

Before you installed BRM, you set up your database based on estimates of the size of tables for your business activity. The planning process also included forecasts of how fast the tables would grow. You should monitor the growth of tables not only to ensure you maintain enough space on your system, but also to check for unexpected growth that would indicate some problem.

On a typical production system, you should check tables monthly. As part of this audit, you should match rows in each of the tables against the expected rows. If you spot discrepancies, checking the individual tables shows where the unexpected growth is coming from. For a list of the BRM tables, see "Storable Class-to-SQL Mapping" in *BRM Developer's Reference*.

If you have a multischema system, you can use growth information to revise your scheme for distributing accounts among your various schemas. See "Setting Database Priorities" in *BRM System Administrator's Guide*.

Monitoring Oracle Tablespace Usage

You should monitor the growth of tables so that you can add more extents or data files before the tablespaces are filled. For information about adding data files to tablespaces, you should make a quick check of the free space remaining in the tablespaces. For example, you can use this SQL command:

```
SQL> select * from user_free_space;
```

This command produces data about the available blocks and bytes for each tablespace. Your database administrator should provide a maximum value. If a tablespace grows past that maximum, you (or an automated script) should notify the database administrator for remedial action.

Monitoring SQL Statements

You can collect debugging information by gathering the SQL statements generated by **dm_oracle** processes. The statements appear in the DM log file, not the DM **pinlog** file.

To get the SQL statements for a specific operation or sequence of events:

1. In the environment from which the **dm_oracle** will be started, set the environment variable **DM_DEBUG3** to **0xFFFF003F**:

Using the c-shell (**cs**h):

```
setenv DM_DEBUG3 0xFFFF003F
```

Using the korn shell (**sh**/**ksh**):

```
DM_DEBUG3=0xFFFF003F
export DM_DEBUG3
```

2. Clear the old log file.
3. Start the Oracle DM.
4. Run the DM operation you are debugging to generate SQL statements.
5. Stop the Oracle DM.
6. Use the **grep** command on the Oracle DM log file for the "SQL_STMT" string.
7. Unset the **DM_DEBUG3** environment variable. Otherwise, subsequent DM operations generate huge log files.

Using the c-shell (**cs**h):

```
% unsetenv DM_DEBUG3
```

Using the korn shell (**sh**/**ksh**):

```
$ unset DM_DEBUG3
```

Rebuilding Indexes

The structure of indexes influences the speed at which BRM can find records in the database. While you are using BRM in a production environment, especially when there is intensive inserting in the database, these indexes can become unbalanced, impeding access to BRM records. For best efficiency, rebuild the indexes frequently. For example, if you have a heavily used production system, you might want to rebuild the indexes weekly.

Caution: Do *not* delete any of the standard BRM indexes without first consulting Oracle. Removing an index can lead to serious performance problems. Also, do *not* delete or change any of the standard stored procedures. Otherwise, the DM might malfunction.

System Requirements

This chapter describes the hardware and software required for an Oracle Communications Billing and Revenue Management (BRM) system.

Important: Before you configure your system, see "Improving BRM Performance" in *BRM System Administrator's Guide* and "[Database Configuration and Tuning](#)". These documents contain information on configuring hardware and software for optimal performance with BRM. They also contain a detailed description of memory configuration for the Connection Manager (CM) and Data Manager (DM) on all platforms.

Overview of Hardware and Software Requirements

Running BRM requires the following:

- A compatible operating system.
See "[Operating System Requirements](#)".
- Available disk space.
See "[Disk Space Requirements](#)".
- Database software.
See "[Database Requirements](#)".
- Network connections.
See "[Network Requirements](#)".

Operating System Requirements

The BRM software is available for the HP-UX IA64, Linux, Solaris, and AIX operating systems. To determine which versions of each operating system are currently supported by BRM, see "[BRM Software Compatibility](#)".

Important: On Solaris operating systems, BRM requires the Forte compiler with the appropriate operating system patches. For the list of patches you must install, see:

<http://www.oracle.com/technetwork/java/index.html>

About Critical Patch Updates

You should install all Critical Patch Updates as soon as possible. To download Critical Patch Updates, find out about security alerts, and enable email notifications about Critical Patch Updates, see the Security topic on Oracle Technology Network:

<http://www.oracle.com/technetwork/topics/security/whatsnew/index.html>

Disk Space Requirements

This section describes the disk space requirements for BRM server processes and applications.

BRM Server

Table 4–1 shows disk space requirements for the BRM server processes:

Table 4–1 Server Disk Space Requirements

BRM System Component	Required Disk Space
BRM server	300 MB
BRM database	2 to 5 GB per 10,000 customers per year. Note: This requirement varies greatly with the number of accounts and the amount of activity.

See "Database Configuration and Tuning" for information on determining your database requirements.

BRM Applications

Table 4–2 shows the details on the applications that BRM supports on the UNIX platform:

Table 4–2 Application Details (Linux)

Application	Type	Required Disk Space
Self-Care Manager	Server application	3 MB
Developer Center	Developer tools	12 MB

Other BRM client applications are supported on Windows. See "Required Disk Space for BRM Windows Applications" for more information.

BRM Service Integration Components

To install optional service integration components such as RADIUS Manager or GSM Manager, you need 60 MB of disk space.

Database Requirements

BRM supports Oracle databases on HP-UX IA64, Linux, Solaris, and AIX platforms.

To run BRM with an Oracle database, you need the following:

- Oracle Enterprise Edition.
- AL32UTF8 and UTF8 database character sets.

Note: BRM 7.5 supports **AL32UTF8** as its default character set. It also continues to support the **UTF8** character set for backward compatibility. The unicode character set **AL32UTF8** is recommended for all new BRM 7.5 deployments.

- (Optional) Oracle Partitioning. You need this to partition the tables in your BRM database. See "Partitioning Tables" in *BRM System Administrator's Guide*.

To determine which versions of the Oracle software are currently supported by BRM, see "[BRM Software Compatibility](#)".

Network Requirements

To set up networking and communications channels, you need TCP/IP. You also need a permanent IP address for each computer that hosts a BRM process or application.

Any kind of network connection that supports TCP/IP supports BRM, for example, local area network, virtual private network, and PPP.

TCP/IP

BRM requires TCP/IP on every machine that runs a BRM component, including custom client programs.

Important: BRM also needs very large bandwidth to handle traffic between the DM and the database. See "[Database Configuration and Tuning](#)" for more information.

IP Addresses

Every computer that runs a BRM component, including the database server, must have its own unique IP address.

Important: BRM uses IP addresses to identify specific machines, so IP addresses cannot be dynamically allocated.

About Oracle Exalogic and Oracle Exadata

BRM is supported on Oracle Exalogic and Oracle Exadata systems. You can install BRM server and client software on an Oracle Exalogic system and the BRM database on an Oracle Exadata system.

You can install and configure the BRM database with Oracle RAC. See the Oracle Exadata documentation for more information about creating an Oracle RAC instance in Oracle Exadata.

See "[Database Configuration and Tuning](#)" for information on configuring hardware and software for optimal performance with BRM. See the discussion about configuring a high-availability system in *BRM System Administrator's Guide* for information on configuring a BRM high-availability system.

When both Oracle Exalogic and Oracle Exadata are available and connected together using InfiniBand network, you can configure a database listener for the network to serve all connection requests from BRM. See the discussion about setup listener on

InfiniBand network using both SDP and TCP protocol (Doc ID 1580584.1) on the My Oracle Support Web site:

<https://support.oracle.com>

Additional Requirements

You need additional software packages to create a complete customer management and billing solution for your business. These packages allow you to take best advantage of BRM functionality:

- Internet software
- Credit card processing software
- Tax calculation software
- Invoice formatting software
- Compilers

See "[BRM Software Compatibility](#)" for a list of third-party software supported by BRM.

Part II

Installing BRM

Part II describes how to install Oracle Communications Billing and Revenue Management (BRM) server and client components. It contains the following chapters:

- [Installing and Configuring the Oracle Database](#)
- [Installing the Third-Party Software](#)
- [Installing BRM](#)
- [Installing a Multischema System](#)
- [Installing BRM Client and Server Applications on UNIX](#)
- [Installing BRM Client and Server Applications on Windows](#)
- [Installing Tax Calculation Managers](#)
- [Installing Paymentech Manager](#)
- [Installing Pipeline Configuration Center](#)
- [Troubleshooting the BRM Installation](#)
- [Installing Multiple BRM Instances on One System for Testing](#)
- [Uninstalling BRM](#)
- [Installation Utilities](#)

Installing and Configuring the Oracle Database

This chapter does the following:

- Describes how to configure your Oracle database to work with the Oracle Communications Billing and Revenue Management (BRM) system.
- Provides a task list to help you make configuration choices when installing Oracle.
- Contains the pre-installation procedures for installing your BRM system.

This chapter is intended for network administrators, technicians, database administrators, and engineers who install and configure the Oracle software for use with BRM. The person installing the software should be familiar with the following topics:

- UNIX commands and the UNIX operating system.
- Database installation and configuration.
- Network Management Systems.
- SQL*Plus.
- A UNIX text editor, such as **vi** or **vi**uepad.

Collecting Information before Installing Oracle

You will need the following documents while installing and configuring the Oracle software:

- Oracle documentation:
 - Oracle 10g or Oracle 11g operating system installation documentation.
- The current release notes for your Oracle software.
- The Oracle Administrator's Guide for instructions on configuring the network.
- A UNIX operating system reference guide.

Information to Note during Oracle Installation

As you install the Oracle software, record the following important information. You will need this information later, when you install BRM.

- Host name of the Oracle database server.
- IP address of the Oracle database server.
- Port number of the Oracle database server.

- User login name and password (the BRM defaults are **pin** and **pin**).
- SID for the BRM database name (the BRM default is **pin**db**hostname**).
- Oracle database alias/Global Database Name (for example, **pin**db**hostname.BRM.com**).

Before Installing Oracle

Before installing Oracle on your system, verify the following:

- Your system meets the minimum hardware and software requirements.
See ["System Requirements"](#).
- You have all the software required to run BRM with an Oracle database.
See ["Database Requirements"](#).
- You planned your Oracle database according to the guidelines in "Improving BRM Performance" in *BRM System Administrator's Guide* and ["Database Configuration and Tuning"](#).

Installing and Configuring Oracle: Task List

This section explains how to install and configure your Oracle database for BRM.

Note: These lists are not a substitute for the Oracle documentation or the most recent release notes for the database.

Installing Oracle for BRM includes these major tasks:

1. [Installing the Oracle Software](#)
2. [Creating your BRM Database](#)
3. [Setting Environment Variables](#)
4. [Setting Your Database for BRM](#)

Installing the Oracle Software

Install Oracle according to the instructions in the Oracle documentation. When you install the software, pay particular attention to the following requirements.

- Install the **Oracle Enterprise Edition**.
- Choose a **Customized** installation. This option lets you configure Oracle with the AL32UTF8 database character set.

Important: If you installed your database before referring to this document and used the **Typical** installation option, your database might have been installed with another character set. See ["Modifying Your Oracle Database Installation"](#) for information on how to modify your existing database.

- To configure discounts in BRM, install the following Oracle components:

- **Oracle XML DB.** For more information, see the Oracle documentation.
- **Oracle XML Developer's Kit (XDK).** For more information, see the Oracle documentation.
- Install Oracle JServer as part of the Oracle Database installation.
- To partition the tables in your BRM database, you must install the **Oracle Partitioning** component. See "Partitioning Tables" in *BRM System Administrator's Guide*.

Creating your BRM Database

Create your database by using the Oracle Database Configuration Assistant, which can be started automatically by the Oracle installer or started manually. If you start it manually, choose the **Custom** option.

Note: BRM 7.5 supports **AL32UTF8** as its default character set. It also continues to support the **UTF8** character set for backward compatibility. The unicode character set **AL32UTF8** is recommended for all new BRM 7.5 deployments.

As you create your database, pay particular attention to the following:

- Specify a **Global Database Name** using the format *DatabaseName.DomainName*, where *DatabaseName* is the database name and *DomainName* is the network domain in which the database is located. For example, **pindbhostname.brm.com**. Most BRM databases use a *DatabaseName* of **pindbhostname**, but you can use another name.

Note: You can modify your machine's default domain name in the **\$ORACLE_HOME/network/admin/sqlnet.ora** file. For information, see your Oracle documentation.

- Specify a **System Identifier (SID)** for your database. For clarity, it should be the same as your Oracle database name. Most BRM databases are named **pindbhostname**, but you can use another name.
 - Set the **Character Set** to **AL32UTF8**.
 - Set the **National Character Set** to **AL16UTF16**.

For detailed instructions on how to create your database, see the Oracle documentation.

Setting Environment Variables

Set the 64-bit environment variables as shown in [Table 5–1](#):

Table 5–1 Environment Variables (64-Bit)

Environment Variable	Value
LD_LIBRARY_PATH_64 (Solaris)	\$ORACLE_HOME/lib

Table 5–1 (Cont.) Environment Variables (64-Bit)

Environment Variable	Value
LD_LIBRARY_PATH (Linux)	\$ORACLE_HOME/lib
SHLIB_PATH (HP-UX IA64)	\$ORACLE_HOME/lib
LIBPATH (AIX)	\$ORACLE_HOME/lib

Setting Your Database for BRM

You have the option to configure your database manually or let the BRM installer configure your database automatically. Set up your database using one of the following options:

- [Using the BRM Installer to Configure Your Database for Demonstration Systems](#)
- [Configuring Your Database Manually for Demonstration Systems](#)
- [Configuring Your Database Manually for Production Systems](#)

Using the BRM Installer to Configure Your Database for Demonstration Systems

The BRM installer provides the option to automatically configure your database for demonstration or development systems. The installer configures your database by creating one data, one index, and one temporary tablespace; creating the BRM user; and granting connection privileges to the BRM user. If you want the BRM installer to configure your database, your Oracle installation is complete and you can go directly to ["Installing BRM"](#).

Configuring Your Database Manually for Demonstration Systems

To configure your database so that it uses additional or larger tablespaces than those created automatically by the BRM installer, you must perform these general tasks:

- [Creating BRM Tablespaces](#)
- [Creating the BRM User for Oracle](#)

Creating BRM Tablespaces

For a simple demonstration BRM system, you must create a minimum of three tablespaces for BRM. The following section shows the steps required to create the following tablespaces:

- **pin00** (for data)
- **pinx00** (for indexes)
- **PINTEMP** (for a temporary tablespace)

To create your tablespaces:

1. Create a directory for the tablespaces, such as **/u02/oradata/pindb**.

This directory is referred to as *table_location*.

2. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@DatabaseAlias
```

3. Create the data, index, and temporary tablespaces, making sure:

- Data tablespaces are at least 600 MB with an extent (“next”) size of 64 KB.
- Index tablespaces are at least 400 MB with an extent size of 64 KB.
- Temporary tablespaces are at least 100 MB with an extent size of 64 KB.

```
SQL> create tablespace pin00 datafile 'table_location/pin00.dbf'
      size 600M reuse autoextend on default
      storage( initial 64K next 64K pctincrease 0 );
```

Tablespace created.

```
SQL> create tablespace pinx00 datafile 'table_location/pinx00.dbf'
      size 400M reuse autoextend on default
      storage( initial 64K next 64K pctincrease 0 );
```

Tablespace created.

```
SQL> create temporary tablespace PINTEMP tempfile
      'table_location/PINTEMP.dbf'
      size 100M reuse autoextend on maxsize unlimited
      storage(initial 64K next 64K pctincrease 0);
```

Tablespace created.

Creating the BRM User for Oracle

Create a new BRM user who can access the Oracle database. The Oracle Data Manager (DM) gains access to the Oracle database by using the Oracle user **pin**. This Oracle user owns all the tables created and used by BRM.

Important: If you are installing a multischema system, the primary and secondary database schemas must *not* use the same user name. If they do, multischema installation will fail.

Usually, the BRM database is set up at the SQL*Plus command prompt with the user name and password **pin**, but you can choose another name and password.

1. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@DatabaseAlias
```

2. Create the Oracle user **pin**, grant the user the resource to connect to Oracle with the user name **pin**, and allow **pin** access to the **pin00** and **PINTEMP** tablespaces:

```
SQL> create user pin identified by password;
```

User created.

```
SQL> grant resource, connect to pin, create synonym, create any synonym;
```

Grant succeeded.

```
SQL> alter user pin default tablespace pin00;
```

User altered.

```
SQL> alter user pin temporary tablespace PINTEMP;
```

User altered.

3. Type **exit** to exit SQL*Plus.

Configuring Your Database Manually for Production Systems

To create a production system, you must create multiple tablespaces for the BRM data and indexes. For information on how to estimate your database size, create multiple tablespaces, and map the tablespaces to BRM tables, see ["Database Configuration and Tuning"](#).

Installing the Database and Oracle DM on Separate Machines

If you are installing your Oracle database and Oracle DM on separate machines, you must perform the following on the machine containing the Oracle DM:

1. Install the Oracle database client.

Important: For BRM installation to be successful:

- Install an Oracle 10g database client if you have an Oracle 10g or Oracle 11g database server. An Oracle 11g database client must be used with an Oracle 11g database server.
 - Install the 32-bit version and 64-bit version of the Oracle database client.
-
-

2. Modify the `$ORACLE_HOME/network/admin/tnsnames.ora` file to include entries for connecting to your BRM database.
3. Use SQL*Plus to ensure that you can connect to your database.

For information, see the Oracle documentation.

Modifying Your Oracle Database Installation

If you installed your Oracle database before referring to this document and accepted the default options, your database installation might have defaulted to an unsupported character set. If this occurred, you must move your data to a database installation that supports the AL32UTF8 or the UTF8 character set. By default, BRM 7.5 uses the AL32UTF8 character set.

Caution: After you create a database, you *cannot change* the character set.

To export your existing data to a database installation that supports the AL32UTF8 character set:

1. Back up your existing database. See your Oracle documentation for details.
2. Uninstall your existing database. See your Oracle documentation for details.
3. Create a new Oracle database that supports the AL32UTF8 character set.
See ["Creating your BRM Database"](#).
4. Use the Oracle Import utility to import your existing data to the new database.

See your Oracle documentation for more information.

What's Next?

Now that you have installed the database server software, you can install the BRM Server and client applications. See ["Installing BRM"](#) and ["Installing BRM Client and Server Applications on UNIX"](#).

Installing the Third-Party Software

This chapter describes how to install the Third-Party software.

About the Third-Party Software

The Third-Party package includes Remote Diagnostic Agent (RDA), Perl libraries and JRE to enable the installation of Oracle Communications Billing and Revenue Management (BRM) software packages that use the InstallShield MultiPlatform (ISMP) installation method and Java servers such as Enterprise Applications Integration (EAI) Manager.

Note: You only need to install the Third-Party package once, before the installation of the first package that uses ISMP installation.

Installing the Third-Party Software

Caution: Do not install the software as the **root** user. Installing the software as the **root** user causes the installation to fail.

To install the Third-Party software package:

1. Download the **7.5.0_ThirdParty_platform_32_opt.extension** installation file to a temporary directory (*temp_dir*).
where:
 - *platform* is the operating system type. For Solaris 10 and Linux systems, use **solaris** or **linux**.
For Solaris 11, the installation file is **7.5PS15_ThirdParty_solaris11_32_opt.bin**.
For HP-UX IA64, the installation file is **7.5PS5_ThirdParty_hpux_ia64_32_opt.bin**.
For AIX, the installation file is **7.5PS1_ThirdParty_aix_32_opt.bin**.
 - *extension* is the appropriate extension for the platform type. Use **bin** for UNIX.
2. Go to the *temp_dir* directory.
3. Run the Third-Party software installation program.

Note: You can use the **-console** parameter to run the installation in command-line mode. To use the graphical user interface (GUI) for installation, make sure you have X Windows installed in your computer.

4. When prompted, enter the directory where you want to install the Third-Party software. The default directory is **/opt/portal/ThirdParty**.
5. The install location and the RDA, JRE and Perl features are displayed. Click **Next** to install the Third-Party package at the specified location.
6. After the installation completes, the installation program displays a message reminding you to execute the source command:

Bash shell:

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

C shell:

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

7. To finish the installation, click Finish.

The Third-Party package is now installed.

Uninstalling the Third-Party Software

To uninstall the Third-Party package, run **uninstaller/ThirdParty/uninstaller.bin** from the directory in which the Third-Party software is installed. The default directory is **/opt/portal/ThirdParty**.

Installing BRM

This chapter describes how to install Oracle Communications Billing and Revenue Management (BRM) on HP-UX IA64, Linux, Solaris, and AIX.

This chapter is for network administrators, database administrators, and engineers who install and configure the BRM software. The person installing the software should be familiar with the following topics:

- UNIX administration commands and the UNIX operating system.
- Database configuration.
- Network system management.
- A UNIX text editor, such as *vi* or *viu*.

Important: For instructions on installing optional components, such as RADIUS Manager or GSM Manager, see the documentation for those components.

Preparing for BRM Installation

To install BRM, you need the following:

- A directory with sufficient space for the Third-Party software and the BRM software (at least 440 MB).
- A user ID, such as **pin**, with the privileges to access the files under your BRM home directory and to execute BRM and third-party applications.

Important: The user ID must also:

- Belong to the **pin** group.
 - Restrict file access from other operating system users.
 - Not have **root** access privileges.
 - Have password protections that prevent unauthorized access.
-

Important: On the system on which you are installing BRM, make sure that a version of Java later than Java 1.6 is not installed. You can install the latest version of Java certified with BRM after installing the base BRM software.

See "[Other Compatible Software](#)" for the latest version of JRE certified with BRM.

- The BRM-related information that you noted when installing your database.

See "[Information to Note during Oracle Installation](#)".

Important: If you are installing BRM on a HP-UX IA64 system, make sure you disable the memory window because BRM shares files for 32- and 64-bit applications from the same address space.

Granting Execute Permission for `dbms_lock`

Before you install BRM, you must grant execute permission to `pin_user` for `dbms_lock`. This ensures that all BRM stored procedures are successfully loaded into the database when the `pin_setup` script for BRM is run:

1. Log in to your database as user `SYS`:

```
% sqlplus "sys/password@databaseAlias as sysdba"
```

where:

- `password` is the Oracle database user password.
- `databaseAlias` is the Oracle database alias.

2. Grant execute privileges to `pin_user`:

```
SQL> grant execute on dbms_lock to pin_user
```

Granting Execute Permission for `billing_updates`

After you install BRM, grant execute permission to BRM users for the `billing_updates` store procedure on both primary and secondary databases by using SQL*Plus.

To grant execute permission for `billing_updates`:

1. Open SQL*Plus by running the following command:

```
% sqlplus "sys/password@databaseAlias as sysdba"
```

where:

- `password` is the Oracle database password.
- `databaseAlias` is the Oracle database alias.

2. Log in to the primary schema and run the following command:

```
SQL> grant execute on billing_updates to pin_schema1, pin_schema2
```

where:

- `pin_schema1` is the username of the primary schema.

- `pin_schema2` is the username of the secondary schema.

This command grants both the primary schema user and the secondary schema user the privilege to run `billing_updates` on the primary schema.

3. Log in to the secondary schema and run the following command:

```
SQL>grant execute on billing_updates to pin_schema1, pin_schema2
```

where:

- `pin_schema1` is the username of the primary schema.
- `pin_schema2` is the username of the secondary schema.

This command grants both the primary schema user and the secondary schema user the privilege to run `billing_updates` on the secondary schema.

Installing the SNMP Software

BRM uses the Simple Network Management Protocol (SNMP) to configure some system components.

Note: SNMP is an optional component.

To install the SNMP software, do the following:

1. Install the Third-Party software package.
See ["Installing the Third-Party Software"](#).
2. 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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).
-

3. 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
```

4. Go to the *temp_dir* directory and enter the following command:

- For Solaris 10 and Linux systems:

```
7.5.0_SNMP_3rd_party_tool_platform_64_opt.bin
```

where *platform* is **solaris** or **linux**.

- For Solaris 11 systems:

```
7.5PS15_SNMP_3rd_party_tool_solaris11_64_opt.bin
```

- For AIX systems:

```
7.5PS1_SNMP_3rd_party_tool_aix_64_opt.bin
```

- For HP-UX IA64 systems:

```
7.5PS5_SNMP_3rd_party_tool_hpux_ia64_64_opt.bin
```

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.

5. Follow the instructions displayed during installation. The default installation directory for the SNMP Third-Party package is **opt/ifw**.

The SNMP Third-Party software is now installed.

Installing and Configuring a BRM Demonstration System

The instructions in this section assume that you are installing all of the BRM components, including the database, on a single computer as shown in [Figure 7-1](#):

Figure 7-1 Single Machine BRM Installation



The procedures for installing a demonstration system include:

1. [Setting the BRM User's Environment](#)
2. [Installing a BRM Demonstration System](#)
3. [Enabling Different Classes for Partitioning during Installation](#)
4. [Running the pin_setup Script](#)
5. (Optional) [Changing Your Database Partitions](#)
6. [Loading the Tailor-Made Stored Procedure](#)

Setting the BRM User's Environment

Create a BRM user, and set the user's environment before installing BRM.

1. In the `.cshrc` file, set the `NLS_LANG` environment variable to **American_America.AL32UTF8**.

Important: You must use **American_America** as the language and territory, regardless of your locale, and the **AL32UTF8** character set.

The other environment variables are set during installation. See "[BRM Environment Variables](#)".

2. Update the environment for the current shell session:

```
% source .cshrc
```

Referencing Environment Variables in `pin.conf` Files

To prepare for migrating `pin.conf` files to other systems or platforms at a future time, you can reference certain environment variables from within the `pin.conf` files, as in this example:

```
- cm fm_module ${PIN_HOME}/lib/fm_utils/${LIBRARYEXTENSION} fm_utils_config fm_utils_init pin
```

For more information, see "Preparing for Platform Migration by Using Variables in `pin.conf` Files" in *BRM System Administrator's Guide*.

Installing a BRM Demonstration System

This section describes how to install a BRM demonstration system.

important: If you are installing BRM to replace an identical release (for example, to restore a clean version of the package), you must first uninstall the existing installation. See "[Uninstalling BRM](#)".

To install BRM:

1. If the Third-Party software package is not installed already, install it.
See "[Installing the Third-Party Software](#)".

2. Log in as user `pin`.

```
% su - pin
```

Caution: Do not install as user `root`.

3. 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. For information, see [Increasing Heap Size to Avoid “Out of Memory” Error Messages](#).
-

4. Stop all BRM processes. See “Starting and Stopping the BRM System” in *BRM System Administrator’s Guide*.
5. 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
```

6. Go to *temp_dir* directory and run the following command:

- For Solaris 10 and Linux systems:

```
7.5.0_Portal_Base_platform_32_opt.bin
```

where *platform* is **solaris** or **linux**.

- For Solaris 11 systems:

```
7.5PS15_Portal_Base_solaris11_32_opt.bin
```

- For AIX systems:

```
7.5PS1_Portal_Base_aix_32_opt.bin
```

- For HP-UX IA64 systems:

```
7.5PS5_Portal_Base_hpux_ia64_32_opt.bin
```

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.

7. Follow the instructions displayed during installation (see [Table 7–1](#)). Your responses are written to the *BRM_Home/setup/pin_setup.values* file, where *BRM_Home* is the directory in which BRM is installed.

Table 7–1 Prompt Descriptions

Prompt	Description
Directory name:	Enter the directory in which to install BRM. The default is /opt/portal/7.5.0 .
Setup type:	Enter the type of installation you prefer. The default is Typical . <ul style="list-style-type: none"> ■ Enter Typical for development and production systems. ■ Enter Demo for test or demonstration systems. This is the quickest option and asks you the least number of questions. ■ Enter Custom for production systems. The installer lets you install a subset of the BRM components.
Select the database type:	Select the version of Oracle Database you are using.
Create BRM Database Tablespaces?	Enter whether you want the installer to create default tablespaces for you. Enter No to create custom tablespaces manually. You must create your tablespaces <i>before</i> you run the pin_setup script. Caution: Entering Yes may cause installation to fail.
Database alias:	Enter your database alias. The default is pin\$dbhostname .
Oracle DM database number:	Enter the database number. The default is 0.0.0.1 .
Oracle DM port:	Enter the port number for the BRM Data Manager (DM). The default is 12950 .
Database username:	Enter your database user name. The default is pin .
Database password:	Enter your database password. The default is pin .
Oracle DM character set:	Enter the character set your database uses. BRM strongly recommends using the AL32UTF8 character set. The default is AL32UTF8 .
Storage Model used for Oracle tablespaces:	Enter the desired size of your database. The default is Small . <ul style="list-style-type: none"> ■ Enter Test for test or demonstration databases smaller than 700 MB. ■ Enter Small for demonstration databases smaller than 1.5 GB. ■ Enter Medium for production databases smaller than 30 GB. ■ Enter Large for production databases larger than 30 GB.
Tablespace name for Tables:	Enter the name of your data tablespace. The default is pin00 .
Tablespace name for Indexes:	Enter the name of your index tablespace. The default is pinx00 .
Drop the BRM tables?	Enter whether you want to drop the database tables. The default is Yes . Caution: If you select Yes , the installer drops all existing tables on your system. This results in irrecoverable loss of data. Do not use this unless you have backed up all of your existing data. If you select No , the installer uses your existing BRM tables. In test systems, select Yes to reinitialize the database.

Table 7–1 (Cont.) Prompt Descriptions

Prompt	Description
Partition tables?	<p>Specify whether you want to enable partitioning. The default is Yes.</p> <p>Caution: To partition tables, you must have Oracle Partitioning installed. If you select Yes but do not have Oracle Partitioning installed, the BRM setup program fails when it tries to create partitions.</p> <ul style="list-style-type: none"> If you select Yes, the following classes are automatically enabled for partitioning: event, bill, invoice, item, journal, newsfeed, sepa, and user activity. To enable other classes for partitioning during installation, see "Enabling Different Classes for Partitioning during Installation". <p>Note: This sets the \$ENABLE_PARTITION parameter to Yes in the pin_setup.values file.</p> <ul style="list-style-type: none"> If you select No, you can enable partitioning after installation. See <i>"Converting Nonpartitioned Classes to Partitioned Classes"</i> in <i>BRM System Administrator's Guide</i>. If you plan to use Rated Event (RE) Loader to load prerated events, you must partition your event tables. <p>For more information, see <i>"Partitioning Tables"</i> in <i>BRM System Administrator's Guide</i>.</p>
Add 12 fixed (monthly) partitions to all event tables?	<p>This prompt is displayed only if you enter Yes to the "Partition tables?" prompt.</p> <p>Specify whether you want the installer to add 12 monthly partitions to your event tables:</p> <ul style="list-style-type: none"> Enter Yes to have the installer add 12 monthly partitions, a historic partition, and a last partition to your event tables. <p>This sets the \$SETUP_CREATE_PARTITIONS parameter to Yes in the pin_setup.values file.</p> <ul style="list-style-type: none"> Enter No if you want the installer to add only a historic partition and a last partition to the event tables. You can use this partitioning layout for a simple test or demonstration system. For a production system, however, you must add purgeable partitions after installation is complete and before the system generates events.
CM Port:	Enter the port number for the Connection Manager (CM). The default is 11960 .
Install Summary:	The install location and features that will be installed are displayed.

- Go to *BRM_Home* and source the **source.me** file:

Bash shell:

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

C shell:

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

- To further configure BRM, such as changing the default currency and country or adding partitions for additional storable classes, edit the *BRM_Home/setup/pin_setup.values* file.

For example, see ["Enabling Different Classes for Partitioning during Installation"](#).

This file stores the information you provided to the installer and a number of database and add-on component parameters.

- Run the *BRM_Home/setup/pin_setup* script.

For information on how to run the `pin_setup` script, see ["Running the pin_setup Script"](#).

Enabling Different Classes for Partitioning during Installation

If you choose to enable partitioning during installation by responding **Yes** to the **Partition tables?** prompt (see step 7), the following storable classes are made partitionable by default when `pin_setup` is run:

- bill
- event
- invoice
- item
- journal
- newsfeed
- sepa
- user activity

To enable partitioning for different storable classes during the BRM installation, you must edit the `pin_setup.values` file *before* running the `pin_setup` script.

Note: To enable partitioning for storable classes *after* installation, see "Converting Nonpartitioned Classes to Partitioned Classes" in *BRM System Administrator's Guide*.

To enable different storable classes for partitioning during installation:

1. Open the `BRM_Home/setup/pin_setup.values` file.
2. Ensure that the `$ENABLE_PARTITION` parameter is set to **Yes**.
3. In the `@CLASSES_TO_BE_PARTITIONED` entry, add or remove storable classes. Following is the default list:

```
@CLASSES_TO_BE_PARTITIONED = ("/bill:local", "/invoice:local", "/item:local",
"/journal:local", "/newsfeed:local", "/sepa:local", "/user_activity:local");
```

- Add classes that you want to enable for partitioning, in the following format:
`"/class_name:index_type"`

Where:

- *class_name* is the name of a base storable class.

Add only base storable classes to the list.

The event storable class is never added to the list. If partitioning is enabled (`$ENABLE_PARTITION = Yes`), the event tables are always partitioned.

- *index_type* is one of the following index types available for non-event partitions (all event indexes are local):

:local — Maintenance can be done without shutting down BRM, but performance may suffer. Search operations are more time consuming because searches must hit every local index.

:global — Search operations are fast, but BRM services must be shut down before adding or dropping partitions. Tables with global indexes require the indexes to be rebuilt.

Caution: When **pin_setup** is run, the tables of storable classes enabled for partitioning get an initial partition. Because BRM does not provide a tool to revert partitioned tables to nonpartitioned tables, these partitions cannot easily be removed after data starts being stored in them.

- Remove storable classes that you do not want to enable for partitioning.
4. Save and close the file.

Running the pin_setup Script

Important: Make sure you logged in as user **pin**. If you logged in as another user, you must manually edit the *BRM_Home/setup/pin_setup* file by changing the PINUSER entry to your user name.

The **pin_setup** script reads the **pin_setup.values** file and the **pin_tables.values** file and configures BRM by performing these tasks:

- Initializes the database.
- Configures the various configuration (**pin.conf**) files.
- Sets up data files, such as Balance Element ID Objects (BEIDs), G/L IDs, ratable usage metrics (RUMs), and price lists.
- Sets up database tables and indexes.

To run the **pin_setup** script:

1. Go to the *BRM_Home/setup* directory and enter the following command:

```
% ./pin_setup
```
2. Check the **pin_setup.log** file for status and errors.

Note: After you run **pin_setup**, the **cm.pinlog** file erroneously contains several PIN_ERROC_FLIST and PIN_ERRCLASS_SYSTEM_DETERMINE error messages. You can safely ignore these messages.

Changing Your Database Partitions

If you *did not* enable partitioning during installation, skip this section.

Note: To enable partitioning after installation, see "Converting Nonpartitioned Classes to Partitioned Classes" in *BRM System Administrator's Guide*.

If you *did* enable partitioning for one or more storable classes during installation, the tables for those storable classes are now divided into the following partitions:

- **Event tables**

- If you chose to add 12 fixed partitions to your event tables, those tables were divided into 12 monthly partitions, a historic partition, and a last partition. See "About the Default Partitioning Scheme" in *BRM System Administrator's Guide*.
- If you chose *not* to add 12 fixed partitions to your event tables, those tables were divided into a historic partition and a last partition (which stores *all* purgeable objects for the table). This partitioning scheme is sufficient for a test or demonstration system. For a production system, however, you must create purgeable partitions.

- **Item tables**

Tables for item storable classes were divided into a historic partition and a last partition.

- **Tables for all other storable classes in @CLASSES_TO_BE_PARTITIONED**

Tables for all storable classes listed in the `pin_setup.values` file's `@CLASSES_TO_BE_PARTITIONED` entry *except* the item storable class were given only one partition, `partition_last` (see "About Objects Stored in `partition_last` and `partition_last_pin`" in *BRM System Administrator's Guide*). For a production system, you must create purgeable partitions.

Note: To test partitioning, you must add at least one purgeable partition.

Important: To change your partitioning scheme (for example, by adding purgeable partitions), do so *before* any objects are stored in the partitions you want to modify. *Do not modify a partition after BRM adds objects to the partition.*

For information about changing your partitioning scheme, see "Partitioning Tables" in *BRM System Administrator's Guide*.

Loading the Tailor-Made Stored Procedure

Loading of the stored procedure is required for the Tailor-Made Plan feature.

The following are the requirements to load the tailor-made stored procedure:

- BRM and Pipeline Manager should be installed.
- The BRM schema and the Pipeline Manager schema should reside on the same database.

To load the stored procedure, do the following:

1. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

2. Grant access of pipeline schema to user `pin` by doing the following:

- a. Run the SQL grant select, update, insert, delete commands on the Pipeline Manager tables. For example, for the `ifw_rateplan` table, run the command:

```
SQL> grant select, update, insert, delete on ifw_rateplan to pin;
```

Run the command on the following tables:

- ifw_rateplan
- ifw_rateplan_cnf
- ifw_rateplan_ver
- ifw_model_selector
- ifw_selector_detail
- ifw_selector_rule
- ifw_selector_rule_lnk
- ifw_selector_ruleset
- ifw_pricemodel
- ifw_pricemdl_step

- b. Run the SQL grant select commands on the Pipeline Manager tables mentioned below. For example, for the ifw_service table, run the command:

```
SQL> grant select on ifw_service to pin;
```

Run the command on the following tables:

- ifw_service
- ifw_timezone
- ifw_timemodel
- ifw_impact_cat
- ifw_zonemodel
- ifw_calendar

- c. Run the SQL grant select commands on the Pipeline Manager sequences. For example, for the ifw_seq_selectordetail sequence, run the command:

```
SQL> grant select ifw_seq_selectordetail to pin;
```

Run the command on the following tables:

- ifw_seq_selectordetail
- ifw_seq_selectorrule
- ifw_seq_modelselector
- ifw_seq_pricemodel
- ifw_seq_rateplan

3. Type **exit** to exit SQL*Plus.
4. Go to the *IFW_Home/database/Oracle/Scripts* directory, where *IFW_Home* is the pipeline install directory.
5. Enter the following command to open SQL*Plus:

```
sqlplus pin/pin@database_Name
```

where *database_Name* is the service name or database alias of the Oracle database.

6. Enter the following command to load the stored procedure:

```
SQL>@create_pricing_tailormadeplan_procedures.plb
```

7. Type **exit** to exit SQL*Plus.

Installing and Configuring a BRM Production System

For a production system, you optimize BRM performance and availability by installing and running the BRM database on its own computer and the various processes on separate computers.

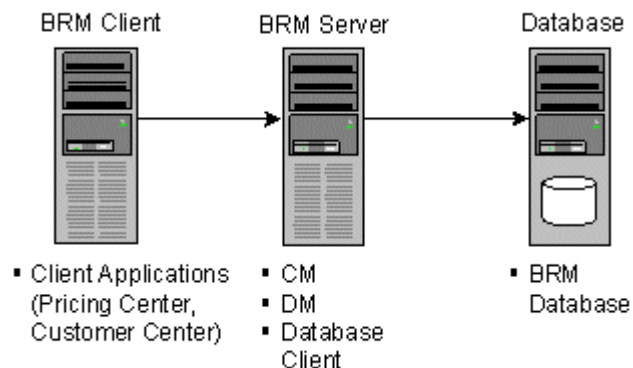
In a production environment, computers are typically dedicated to the following functions:

- Client applications
- CM and Oracle DM
- BRM database

For an overview of the different ways to set up a production system, see ["Types of BRM Systems"](#).

The instructions in this section assume that you have three machines in your production system as shown in [Figure 7-2](#):

Figure 7-2 Production BRM System on Three Machines



- The *BRM client machine* is a Windows system that runs BRM client applications, such as Pricing Center. These applications provide a graphical user interface to the data in the BRM database. All client applications communicate with BRM through the CM.
- The *BRM server machine* contains your CM, DM, and database client. BRM communicates with the database through the Oracle DM.
- The *database machine* contains your BRM database.

The procedures for installing a production system include:

1. [Installing the Database Client](#)
2. [Setting the BRM User's Environment](#)
3. [Installing a BRM Production System](#)
4. [Editing the pin_setup.values File](#)

5. [Editing the pin_tables.values File](#)
6. [Enabling Different Classes for Partitioning during Installation](#)
7. [Running the pin_setup Script](#)
8. [Completing the Installation](#)
9. (Optional) [Changing Your Database Partitions](#)
10. (Optional) [Installing Sample Data Files](#)
11. [Installing Optional Components on a Separate Machine from the CM](#)
12. [Loading the Tailor-Made Stored Procedure](#)

Installing the Database Client

If you are installing the Oracle DM and your database on separate machines, you must install a database client. For information, see ["Installing the Database and Oracle DM on Separate Machines"](#).

Setting the BRM User's Environment

Create a BRM user and set the user's environment before installing BRM.

1. In the `.cshrc` file, see the `NLS_LANG` environment variable to **American_America.AL32UTF8**.

Important: You must use **American_America** as the language and territory, regardless of your locale, and the **AL32UTF8** character set.

2. Update the environment for the current shell session:

```
% source .cshrc
```

Referencing Environment Variables in pin.conf Files

To prepare for migrating `pin.conf` files to other systems or platforms at a future time, you can reference certain environment variables from within the `pin.conf` files, as in this example:

```
- cm fm_module ${PIN_HOME}/lib/fm_utils/${LIBRARYEXTENSION} fm_utils_config fm_utils_init pin
```

For more information, see "Preparing for Platform Migration by Using Variables in `pin.conf` Files" in *BRM System Administrator's Guide*.

Installing a BRM Production System

Note: If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

You can install a subset of BRM components, such as the CM and DM, on a single machine to save disk space.

Important: If you are installing the CM and DM on separate machines, make sure all DMs are running before you install the CM.

To install individual components:

1. If the Third-Party software package is not installed already, install it.
See ["Installing the Third-Party Software"](#).
2. Log in as user **pin**.
3. Stop all BRM processes. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
4. Go to the *temp_dir* directory where you downloaded the BRM software and enter the following command:

- For Solaris 10 and Linux systems:

7.5.0_Portal_Base_platform_32_opt.bin

where *platform* is **solaris** or **linux**.

- For Solaris 11 systems:

7.5PS15_Portal_Base_solaris11_32_opt.bin

- For AIX systems:

7.5PS1_Portal_Base_aix_32_opt.bin

- For HP-UX IA64 systems:

7.5PS5_Portal_Base_hpux_ia64_32_opt.bin

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.

This starts the installation program.

5. Enter **Custom** when asked to specify the setup type.
Select features you want to install by typing their respective numbers. Click **Next**.
6. Follow the instructions displayed during installation.
Your responses are written to the *BRM_Home/setup/pin_setup.values* file. For a description of all prompts, see ["Prompt Descriptions"](#).
7. Go to the directory where you installed the BRM software and source the **source.me** file:

Bash shell:

source source.me.sh

C shell:

source source.me.csh

8. To further configure BRM, such as changing the default currency and country, edit the *BRM_Home/setup/pin_setup.values* file.

The component files are copied to your machine.

Editing the pin_setup.values File

To further configure BRM, such as changing the default currency and country, you edit the *BRM_Home/setup/pin_setup.values* file. This file stores the information you provided to the installer and a number of database and add-on component parameters.

The entries you need to edit in the **pin_setup.values** file depend on which components you install on the current machine. For example, if you are installing the Email DM on the current machine, edit the **\$DM_EMAIL** entries.

The following examples show the important entries to check in three configurations:

- The CM and DM reside on separate machines.
- The system contains multiple Oracle DMs connected to one database.
- Invoices are stored in a separate database schema.

Example 7–1 The CM and DM Reside on Separate Machines

Machines that contain a CM must include the correct port number and host name of each DM in the system. This is especially critical when DMs reside on separate machines from the CM.

For example, you might install the Oracle DM and Email DM on a separate machine from the CM. In this case, you must modify the parameters in the CM machine's **pin_setup.values** file as shown in [Table 7–2](#):

Table 7–2 CM Machine's pin_setup Values

Entry	Description
\$DM_ORACLE{'port'}	Must contain the port number of the Oracle DM.
\$DM_ORACLE{'hostname'}	Must contain the host name of the machine running the Oracle DM.
\$DM_EMAIL{'port'}	Must contain the port number of the Email DM.
\$DM_EMAIL{'hostname'}	Must contain the host name of the machine running the Email DM.

Example 7–2 The System Contains Multiple Oracle DMs Connected to One Database

When your system contains multiple Oracle DMs connected to one database, you must initialize the database and drop the tablespaces only *once*. In this case, you must modify each DM machine's **pin_setup.values** file as shown in [Table 7–3](#):

Table 7–3 DM Machine's pin_setup Values

Entry	Description
\$SETUP_INIT_DB	Must be set to Yes on the primary Oracle DM machine; on all other machines containing an Oracle DM, set to No .
\$SETUP_DROP_ALL_TABLES	Must be set to Yes on the primary Oracle DM machine; on all other machines containing an Oracle DM, set to No .

Example 7-3 Invoices Are Stored in a Separate Database Schema

Storing invoices in their own database schemas speeds up the invoicing process; enables you to store a large number of invoices; and enables you to view, email, and print invoices without affecting the performance of the main BRM schema.

If you are storing invoices in their own schemas, you must update the **pin_setup.values** file to include the correct pointers to the invoice schema. Therefore, you must modify the parameters listed in [Table 7-4](#) on the machine containing the Invoice DM.

Note: The Invoice DM is supported only on Oracle databases.

Table 7-4 Invoice DM Machine's pin_setup Values

Entry	Description
\$INVOICE_DB{'user'}	Must contain the user name to log in to your invoice schema. This user name must be different from the one used for the main BRM schema.
\$INVOICE_DB{'password'}	Must contain the password to log in to your invoice schema.
\$INVOICE_DB{'alias'}	Must contain the database alias of the invoice schema.
\$INVOICE_DB{'Host'}	Must contain the host name of the machine running the invoice schema.
\$INVOICE_DB{'tables_group'}	Must contain the name of the data tablespace.
\$INVOICE_DB{'indexes_group'}	Must contain the name of the index tablespace.
\$DM_INVOICE{'port'}	Must contain the port number of the Invoice DM. For guidelines, see "Guidelines for Database and Port-Number Entries" in <i>BRM System Administrator's Guide</i> .
\$DM_INVOICE{'db_num'}	Must contain the database number for the invoice schema.

Editing the pin_tables.values File

If you install BRM with the default settings, BRM data is stored in a single tablespace (**pin00**), and BRM indexes are stored in a second tablespace (**pinx00**). Although you can run and test BRM with just these tablespaces, you need multiple tablespaces for optimal performance on a production system.

If your BRM database contains multiple tablespaces, you must use the *BRM_Home/setup/scripts/pin_tables.values* file to map the BRM tables to the tablespaces you created in Oracle. For information on how to map your tables, see ["Mapping Tablespaces to Logical Devices"](#).

Enabling Different Classes for Partitioning during Installation

If you choose to enable partitioning during installation by responding **Yes** to the **Partition tables?** prompt (see step 7), the following storable classes are made partitionable by default when **pin_setup** is run:

- bill
- event
- invoice
- item
- journal

- newsfeed
- sepa
- user activity

To enable partitioning for different storable classes during the BRM installation, you must edit the **pin_setup.values** file *before* running the **pin_setup** script.

Note: To enable partitioning for storable classes *after* installation, see "Converting Nonpartitioned Classes to Partitioned Classes" in *BRM System Administrator's Guide*.

To enable different storable classes for partitioning during installation:

1. Open the *BRM_Home/setup/pin_setup.values* file.
2. Ensure that the \$ENABLE_PARTITION parameter is set to **Yes**.
3. In the @CLASSES_TO_BE_PARTITIONED entry, add or remove storable classes. Following is the default list:

```
@CLASSES_TO_BE_PARTITIONED = ("/bill:local", "/invoice:local", "/item:local",  
"/journal:local", "/newsfeed:local", "/sepa:local", "/user_activity:local");
```

- Add classes that you want to enable for partitioning, in the following format:

```
"/class_name:index_type"
```

Where:

- *class_name* is the name of a base storable class.

Add only base storable classes to the list.

The event storable class is never added to the list. If partitioning is enabled (\$ENABLE_PARTITION = **Yes**), the event tables are always partitioned.

- *index_type* is one of the following index types available for non-event partitions (all event indexes are local):

:local — Maintenance can be done without shutting down BRM, but performance may suffer. Search operations are more time consuming because searches must hit every local index.

:global — Search operations are fast, but BRM services must be shut down before adding or dropping partitions. Tables with global indexes require the indexes to be rebuilt.

Caution: When **pin_setup** is run, the tables of storable classes enabled for partitioning get an initial partition. Because BRM does not provide a tool to revert partitioned tables to nonpartitioned tables, these partitions cannot easily be removed after data starts being stored in them.

- Remove storable classes that you do not want to enable for partitioning.
4. Save and close the file.

Running the `pin_setup` Script

The `pin_setup` script reads the `pin_setup.values` and `pin_tables.values` files and configures BRM by:

- Configuring your various configuration (`pin.conf`) files.
- Setting up database tables and indexes.

To run the `pin_setup` script:

1. Go to the `BRM_Home/setup` directory and enter the following command:

```
% ./pin_setup
```

2. If you receive a notification that you must append information to the CM `pin.conf` file:
 - a. Append the lines from the `BRM_Home/append_to_cm_pin_conf` file to the CM machine's `BRM_Home/sys/cm/pin.conf` file.
 - b. Stop and restart the CM process.

You receive the notification shown below when you install a DM component on a separate machine from the CM component:

```
Warning: File not found: BRM_Home/sys/cm/pin.conf
To complete the install, append the following
file to the sys/cm/pin.conf file and then restart the CM
process:
"BRM_Home/append_to_cm_pin_conf"
```

3. Check the `pin_setup.log` file for status and errors.

Note: After you run `pin_setup`, the `cm.pinlog` file erroneously contains several `PIN_ERROC_FLIST` and `PIN_ERRCLASS_SYSTEM_DETERMINATE` error messages. You can safely ignore these messages.

By default, the `pin_setup` script configures only the last installed product by reading the `pin_setup.values` file. You can also do the following:

- Use the `-all` parameter to configure BRM and all the optional components present in the `@PRODUCT_LIST` section of `pin_setup.values`.

For example, go to the `BRM_Home/setup` directory and enter the following command:

```
pin_setup -all
```

- Use the `productname` parameter to configure only BRM or an optional component present in the `@PRODUCT_LIST` section of the `pin_setup.values` file.

For example, go to the `BRM_Home/setup` directory and enter the following command:

```
pin_setup productname
```

where *productname* indicates the name of the optional component you want to configure.

Important: Make sure *productname* matches the name of the optional component present in the @PRODUCT_LIST section of the **pin_setup.values** file.

Completing the Installation

After BRM has been installed on each computer, check the parameters in the CM configuration file (*BRM_Home/sys/cm/pin.conf*) and Oracle DM configuration file (*BRM_Home/sys/dm_oracle/pin.conf*).

1. In the *BRM_Home/sys/cm/pin.conf* file, verify that the **dm_pointer** entry contains the DM machine's host name or IP address.

Your **pin.conf** file must contain a **dm_pointer** entry for each DM in your system. Verify that any additional **dm_pointer** entries include the correct host name:

```
- cm dm_pointer 0.0.0.1 ip dm_machine 12950
```

2. In the *BRM_Home/sys/dm_oracle/pin.conf* file, make sure the DM points to the correct database:

```
- dm sm_database databaseAlias
```

Installation is now complete. If you encountered installation problems, verify that the settings in the **pin_setup.values** file on each computer point to the correct CM and DM.

Changing Your Database Partitions

If you *did not* enable partitioning during installation, skip this section.

Note: To enable partitioning after installation, see "Converting Nonpartitioned Classes to Partitioned Classes" in *BRM System Administrator's Guide*.

If you *did* enable partitioning for one or more storable classes during installation, the tables for those storable classes are now divided into the following partitions:

■ Event tables

- If you chose to add 12 fixed partitions to your event tables, those tables were divided into 12 monthly partitions, a historic partition, and a last partition. See "About the Default Partitioning Scheme" in *BRM System Administrator's Guide*.
- If you chose *not* to add 12 fixed partitions to your event tables, those tables were divided into a historic partition and a last partition (which stores *all* purgeable objects for the table). This partitioning scheme is sufficient for a test or demonstration system. For a production system, however, you must create purgeable partitions.

■ Item tables

Tables for item storable classes were divided into a historic partition and a last partition.

■ Tables for all other storable classes in @CLASSES_TO_BE_PARTITIONED

Tables for all storable classes listed in the **pin_setup.values** file's @CLASSES_TO_BE_PARTITIONED entry *except* the item storable class were given only one

partition, **partition_last** (see "About Objects Stored in partition_last and partition_last_pin" in *BRM System Administrator's Guide*). For a production system, you must create purgeable partitions.

Note: To test partitioning, you must add at least one purgeable partition.

Important: To change your partitioning scheme (for example, by adding purgeable partitions), do so *before* any objects are stored in the partitions you want to modify. *Do not modify a partition after BRM adds objects to the partition.*

For information about changing your partitioning scheme, see "Partitioning Tables" in *BRM System Administrator's Guide*.

Installing Sample Data Files

When you perform a custom installation, the installer does not copy sample data files, such as Balance Element ID Objects (BEIDs), G/L IDs, ratable usage metrics (RUMs), and price lists, to your system. You must create your own data files or install the BRM sample data files before you can use any client applications, such as Pricing Center.

To install the BRM sample data files:

1. Log in to the machine containing the primary CM.
2. Go to the *BRM_Home/setup* directory and open the **pin_setup.values** file in a text editor such as *vi*.
3. Change the **\$SETUP_INIT_DB** entry to **Yes** and make sure all pointers to all DMs contain the correct port number.
4. Save and close the file.
5. Go to the *BRM_Home/setup/scripts* directory and enter the following command:

```
% perl pin_cmp_pin_bill.d.pl
```
6. Stop and restart the CM processes. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Installing Optional Components on a Separate Machine from the CM

If you install any optional components on a separate machine from your CM, manually edit each component's configuration file to include the following:

- The correct CM port number.
- The correct host name for the CM machine.
- Any component-specific Facilities Module (FM) entries. For information, see "Syntax for Facilities Module (FM) Entries" in *BRM System Administrator's Guide*.

Loading the Tailor-Made Stored Procedure

Loading of the stored procedure is required for the Tailor-Made Plan feature.

The following are the requirements to load the tailor-made stored procedure:

- BRM and Pipeline Manager should be installed.
- The BRM schema and the Pipeline Manager schema should reside on the same database.

To load the stored procedure, do the following:

1. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

2. Grant access of pipeline schema to user **pin** by doing the following:

- a. Run the SQL grant select, update, insert, delete commands on the Pipeline Manager tables. For example, for the ifw_rateplan table, run the command:

```
SQL> grant select, update, insert, delete on ifw_rateplan to pin;
```

Run the command on the following tables:

- ifw_rateplan
- ifw_rateplan_cnf
- ifw_rateplan_ver
- ifw_model_selector
- ifw_selector_detail
- ifw_selector_rule
- ifw_selector_rule_lnk
- ifw_selector_ruleset
- ifw_pricemodel
- ifw_pricemdl_step

- b. Run the SQL grant select commands on the Pipeline Manager tables mentioned below. For example, for the ifw_service table, run the command:

```
SQL> grant select on ifw_service to pin;
```

Run the command on the following tables:

- ifw_service
- ifw_timezone
- ifw_timemodel
- ifw_impact_cat
- ifw_zonemodel
- ifw_calendar

- c. Run the SQL grant select commands on the Pipeline Manager sequences. For example, for the ifw_seq_selectordetail sequence, run the command:

```
SQL> grant select ifw_seq_selectordetail to pin;
```

Run the command on the following tables:

- ifw_seq_selectordetail
- ifw_seq_selectorrule

- ifw_seq_modelselector
 - ifw_seq_pricemodel
 - ifw_seq_rateplan
3. Type **exit** to exit SQL*Plus.
 4. Go to the *BRM_Home/sys/dm_oracle/data* directory.
 5. Enter the following command to open SQL*Plus:

```
sqlplus pin/pin@database_Name
```

where *database_Name* is the service name or database alias of the Oracle database.
 6. Enter the following command to load the stored procedure:

```
SQL>@create_pricing_tailormadeplan_procedures.plb
```
 7. Type **exit** to exit SQL*Plus.

BRM Environment Variables

Table 7–5 shows the BRM environment variables. All of these environment variables are set during installation except for **NLS_LANG**.

Note: Do not change the default setting for **NLS_LENGTH_SEMANTICS**.

Table 7–5 *BRM Environment Variables*

Environment Variable	Description
PIN_HOME	The directory where the BRM software will be installed. The default PIN_HOME value is /opt/portal/7.5 . The BRM documentation refers to this location as <i>BRM_Home</i> . Note: You can reference this variable in pin.conf configuration files. See "Preparing for Platform Migration by Using Variables in pin.conf Files" in <i>BRM System Administrator's Guide</i> .
PIN_LOG_DIR	The directory where the BRM log file will be installed. The default PIN_LOG_DIR value is /opt/portal/7.5/var . Note: You can reference this variable in pin.conf configuration files.
LIBPATH (AIX only)	The path to the AIX library files. Set this to include \$PIN_HOME/lib , \$PIN_HOME/bin , and \$PIN_HOME/bin/classic .
LD_LIBRARY_PATH (Solaris and Linux)	The path to the Solaris and Linux library files. Normally, this value should be \$PIN_HOME/lib .
SHLIB_PATH (HP-UX IA64 only)	The path to the HP-UX IA64 library files. Normally, this value should be \$PIN_HOME/lib .
LIBRARYEXTENSION	The extension for the libraries used by your platform. There is no default value. Extensions for Solaris, Linux, and HP-UX IA64 platform types are .so ; extensions for AIX platform types are .a . Note: You can reference this variable in pin.conf configuration files.
LIBRARYPREFIX	The prefix for the libraries used by your platform. There is no default value. <ul style="list-style-type: none"> ▪ lib Note: You can reference this variable in pin.conf configuration files.

Table 7–5 (Cont.) BRM Environment Variables

Environment Variable	Description
PATH	The path of the BRM binary files. This value should be <code>\$PIN_HOME/bin</code> . For AIX, also include <code>\$PIN_HOME/jre/bin</code> .
PERL5LIB	Set this to include the path to your Perl files. By default, the BRM installer copies the Perl files to <code>/opt/portal/7.5/lib</code> and <code>/opt/portal/7.5/perl/5.8.0/lib</code> .
NLS_LANG	Set this to <code>American_America.AL32UTF8</code> . Important: You must use <code>American_America</code> as the language and territory, regardless of your locale, and the <code>AL32UTF8</code> character set.

What's Next?

You installed the BRM system software, which you can use to test your business models. To set up pricing plans, business policies, and customer accounts, you must install the BRM client applications. See ["Installing BRM Client and Server Applications on UNIX"](#).

Installing a Multischema System

This chapter explains how to install an Oracle Communications Billing and Revenue Management (BRM) multischema system.

This chapter is for network administrators, database administrators, and engineers who install and configure BRM software. The person installing the software should be familiar with the following technologies:

- UNIX operating systems
- Database installation and configuration
- Network management systems

Before Installing a Multischema System

Before you install a multischema system, verify the following:

- Your system meets the minimum hardware and software requirements.
See ["System Requirements"](#).
- You have all the software required to run BRM with an Oracle database in an Oracle Real Application Clusters (Oracle RAC) system.
See ["Database Requirements"](#).
- All database schemas in your system use the following:
 - A unique schema name
 - The same tablespace names

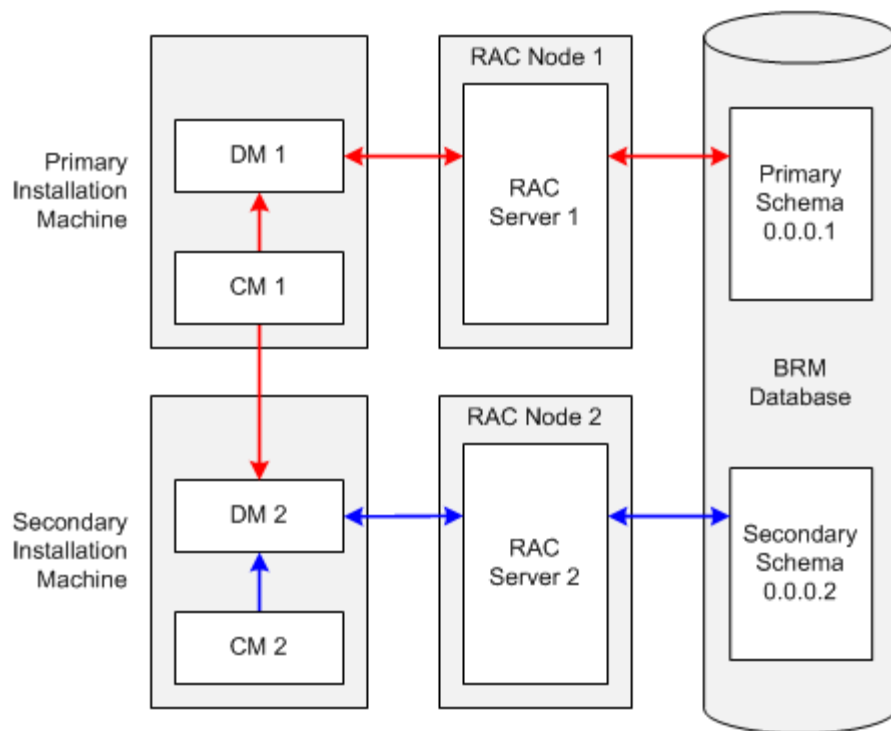
Installing a Multischema BRM System

You can distribute BRM data among multiple database schemas to increase scalability and availability. For more information about multischema systems, see ["A BRM Multischema Production System"](#).

Multischema Installation Overview

Typically, a multischema system includes one or more database schema machines and several machines running BRM. You configure the additional BRM machines so that each Oracle Data Manager (DM) process communicates with one particular schema across the network.

For example, [Figure 8–1](#) shows a multischema system with two BRM installation machines and two schemas.

Figure 8–1 Two-Schema BRM Multischema Environment

- The *primary installation machine* must contain, at a minimum, the primary Connection Manager (CM), the primary Oracle DM, and a database client. The primary CM communicates with both primary and secondary Oracle DMs, and the primary DM is dedicated to the primary database schema.
- The *secondary installation machine* must contain, at a minimum, a secondary DM and a database client. In figure [Figure 8–1](#), it also contains a secondary CM. The secondary CM communicates with the secondary DM, and the secondary DM is dedicated to the secondary database schema. Although the secondary CM is not required, it enables you to perform dedicated operations, such as billing, on the secondary database schema.
- The *primary database schema* contains all the configuration, pricing, audit trail, and uniqueness objects. Modifications to configuration, pricing, and audit trail objects are always performed by the primary DM in the primary database schema. Secondary DMs can modify uniqueness objects in the primary database schema by using schema qualifications. The primary database schema also contains subscriber data, such as events and account objects.
- The *secondary database schema* contains subscriber data. Each secondary database schema also has access to the configuration, pricing, audit trail, and uniqueness objects stored in the primary database schema.

Installing a Multischema System: Task List

This section provides an overview of the tasks you must perform to install and configure a multischema system.

1. Install an Oracle database across all the servers in your Oracle RAC system.

For more information, see the following:

- [Installing and Configuring the Oracle Database](#)

- [Setting Up Oracle RAC for a Multischema System](#)
 - Oracle RAC documentation
2. Through one Oracle RAC node, create the primary database schema.
See "[Creating the BRM User for Oracle](#)".

Note: The term "BRM user" is synonymous with the term "database schema."

3. Through each of the other Oracle RAC nodes, create a secondary database schema.
See "[Creating the BRM User for Oracle](#)".
4. Configure each database schema in your system to connect to all the other database schemas, and verify that the connections work.

Note: This enables the database links created when you run the **pin_multidb.pl** script (see step 15) to work across the schemas.

For information, see your Oracle database documentation.

5. For each database schema, grant execute permission for **dbms_lock**.
See "[Granting Execute Permission for dbms_lock](#)".
6. On your primary installation machine, install the Third-Party software package, which includes the PERL libraries and the JRE required to install BRM components.
See "[Installing the Third-Party Software](#)".
7. On each of your secondary installation machines, install the Third-Party software package.
See "[Installing the Third-Party Software](#)".
8. On your primary installation machine, install BRM.
See "[Setting Up BRM on the Primary Installation Machine](#)".
9. On your secondary installation machines, install BRM.
See "[Setting Up BRM on a Secondary Installation Machine](#)".
10. Verify that the BRM installation machines can connect to all the schemas.
See "[Verifying That the Installation Machines Connect to All Schemas](#)".
11. Install Multidatabase Manager on the primary installation machine.
See "[Installing Multidatabase Manager on the Primary Installation Machine](#)".
12. (Optional) Disable the creation of uniqueness objects.
See "[Disabling Creation of Uniqueness Objects](#)".
13. Edit the **pin_multidb.conf** file on the primary installation machine.
See "[Configuring pin_multidb.conf on the Primary Installation Machine](#)".
14. Grant Oracle database system privileges to each database schema in your system.
See "[Granting System Privileges to Each Database Schema](#)".

15. Run the **pin_multidb.pl** script on the primary installation machine.
See ["Running pin_multidb.pl on the Primary Installation Machine"](#).
16. (Optional) Make custom tables available to all the schemas in your system.
See "Creating Custom Tables That Are Available to All Database Schemas" in *BRM System Administrator's Guide*.
17. (Optional) Configure BRM to enforce the creation of unique account numbers.
See ["Enforcing the Creation of Unique Account Numbers"](#).

Setting Up Oracle RAC for a Multischema System

To set up Oracle RAC for a multischema system:

1. Set up an Oracle RAC instance for each database schema that you plan to create.
For more information, see your Oracle RAC documentation.
2. Configure Oracle database services.
See ["Configuring Oracle Database Services"](#).
3. Add entries for the Oracle database services to all **tnsnames.ora** files that will be referenced by the Oracle DMs in your system.
See ["Defining Connections to the Oracle Database Services"](#).

Configuring Oracle Database Services

You use Oracle database services to connect Oracle DMs to Oracle RAC instances. You must map each database service to one Oracle RAC instance.

For example, if your system has four database schemas and five Oracle RAC instances, configure the database services as shown in [Table 8–1](#):

Table 8–1 Example Database Service Configuration

Database Service	Oracle RAC Instance	Backup Oracle RAC Instance for High Availability
Service1	Oracle RAC instance 1	Oracle RAC instance 5
Service2	Oracle RAC instance 2	Oracle RAC instance 5
Service3	Oracle RAC instance 3	Oracle RAC instance 5
Service4	Oracle RAC instance 4	Oracle RAC instance 5

Note: Oracle RAC systems are typically configured for high availability, so a backup Oracle RAC instance is included in the examples in this section. The backup instance is not required, however, for a multischema system. For more information about high-availability systems, see "Administering a High-Availability System" in *BRM System Administrator's Guide*.

To create the services in the preceding table, log on to any Oracle RAC node as the Oracle database administrator, and run the following commands:

```

srvctl add service -d racDatabaseName -s service1 -r racInstanceName1 -a racInstanceName5 -P Basic
srvctl add service -d racDatabaseName -s service2 -r racInstanceName2 -a racInstanceName5 -P Basic
srvctl add service -d racDatabaseName -s service3 -r racInstanceName3 -a racInstanceName5 -P Basic

```

```
srvctl add service -d racDatabaseName -s service4 -r racInstanceName4 -a racInstanceName5 -P Basic
```

For information about the **srvctl** command, see your Oracle RAC documentation.

Defining Connections to the Oracle Database Services

To define connections to the Oracle database services:

1. Open the appropriate **tnsnames.ora** file in a text editor.
By default, that file is in the *Oracle_Home/network/admin/* directory.
2. For each database service, add the following connect descriptor:

```
connectionString =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = primaryRacInstanceHostName) (PORT =
oraHostPortNo))
    (ADDRESS = (PROTOCOL = TCP) (HOST = backupRacInstanceHostName) (PORT =
oraHostPortNo))
    (LOAD_BALANCE = OFF)
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = serviceName)
      (FAILOVER_MODE =
        (TYPE = SELECT)
        (METHOD = BASIC)
        (RETRIES = 180)
        (DELAY = 5)
      )
    )
  )
```

where:

- *connectionString* is the connection name.

Note: The **sm_database** entry in the Oracle DM **pin.conf** file must match this entry. See ["Setting Up BRM on the Primary Installation Machine"](#) and ["Setting Up BRM on a Secondary Installation Machine"](#).

- **ADDRESS** defines a single listener protocol address. Add an entry for the primary Oracle RAC instance's listener and the backup Oracle RAC instance's listener.
- *primaryRacInstanceHostName* is the name of the computer on which the service's primary Oracle RAC instance resides.
- *backupRacInstanceHostName* is the name of the computer on which the service's backup Oracle RAC instance resides.
- *oraHostPortNo* is the port number for the Oracle database on the host computer. Typically, this number is 1521.
- **LOAD_BALANCE** specifies whether to distribute connection requests across the listeners specified in the **ADDRESS** entries. For high-availability BRM systems, set this to **OFF**.
- *serviceName* specifies the name of the database service.

Note: The **sm_svcname** entry in the Oracle DM **pin.conf** file must match this entry. See ["Setting Up BRM on the Primary Installation Machine"](#) and ["Setting Up BRM on a Secondary Installation Machine"](#).

- For **FAILOVER MODE**,
TYPE = SELECT specifies that work in progress is not lost when failover occurs from the primary to the backup Oracle RAC node.
METHOD = BASIC specifies that applications connect to a backup Oracle RAC node only *after* their connection to the primary Oracle RAC node fails. Backup connections are not preestablished.
3. Save and close the file.

Setting Up BRM on the Primary Installation Machine

The primary installation machine must contain, at a minimum, the primary CM, the primary Oracle DM, and a database client.

Note: The database client is required because the primary Oracle DM and the primary database schema are installed on different machines.

To set up the primary installation machine:

1. Install BRM according to the instructions in ["Installing and Configuring a BRM Production System"](#).
2. Connect the Oracle DM to the primary Oracle RAC instance:
 - a. Open the Oracle DM configuration file in a text editor:
BRM_home/sys/dm_oracle/pin.conf
 - b. Set the **sm_database** entry to the connect descriptor configured for the primary Oracle RAC instance:

```
- dm sm_database connectionString
```


connectionString must match the *connectionString* entry for the primary Oracle RAC instance in the **tnsnames.ora** file.
 - c. Add the following entry:

```
- dm sm_svcname serviceName
```


serviceName must match the **SERVICE_NAME** entry in the connect descriptor specified in the preceding step.
 - d. Save and close the file.
 - e. Stop and restart the Oracle DM. See ["Starting and Stopping the BRM System"](#) in *BRM System Administrator's Guide*.
3. Configure the primary database client to connect to each secondary database schema.

For information, see ["Installing the Database and Oracle DM on Separate Machines"](#).

4. Install the optional components you purchased that might add tables to your database.

Important:

- You must install optional components *before* you run the **pin_multidb.pl** script to ensure that configuration objects from your optional component tables are made available to your secondary database schemas. See ["Running pin_multidb.pl on the Primary Installation Machine"](#).
 - If you are installing wireless managers, such as the Account Synchronization DM or GSM Manager, you must run the **object_auditing** script *after* you run the **pin_multidb.pl** script. Otherwise, installation will fail.
-
-

Setting Up BRM on a Secondary Installation Machine

A secondary installation machine must contain, at a minimum, an Oracle DM and a database client.

Note: The database client is required because a secondary installation machine and its corresponding secondary database schema machine (which is in an Oracle RAC system) are different machines.

Important: You must install all of the BRM software on all machines that run a BRM process, even if you run only a CM or a DM on a particular machine.

To set up a secondary installation machine:

1. Install BRM according to the instructions in ["Installing and Configuring a BRM Production System"](#), with this exception:

Before running the **pin_setup** script, set the following parameters in the *BRM_home/setup/pin_setup.values* file as follows:

- Set **\$SETUP_INIT_DB** to **Yes**.
- Set **\$DM_ORACLE{'db_num'}** to **0.0.0.2**.

For subsequent schemas, use database numbers **0.0.0.3**, **0.0.0.4**, and so on. Each schema must have a unique database number.

2. Connect the Oracle DM to a secondary Oracle RAC instance:

- a. Open the Oracle DM configuration file in a text editor:

*BRM_home***BRM_home/sys/dm_oracle/pin.conf**

- b. Set the **sm_database** entry to the connect descriptor configured for a secondary Oracle RAC instance:

- dm sm_database *connectionString*

connectionString must match the *connectionString* entry for a secondary Oracle RAC instance in the **tnsnames.ora** file.

- c. Add the following entry:

```
- dm sm_svcname serviceName
```

serviceName must match the **SERVICE_NAME** entry in the connect descriptor specified in the preceding step.
- d. Save and close the file.
- e. Stop and restart the Oracle DM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
3. Configure the secondary database client to connect to the primary database schema.

For information, see ["Installing the Database and Oracle DM on Separate Machines"](#).
4. Install the same optional components that you installed on the primary installation machine.

Verifying That the Installation Machines Connect to All Schemas

Verify that BRM was installed and set up properly on your installation machines by connecting to the primary and secondary database schemas.

Using testnap to Verify Access to Your Schemas

The BRM **testnap** utility tests your installation machine's connection to the database schema by establishing a Portal Communications Module (PCM) connection with the CM and executing PCM opcodes using that connection. For more information, see "testnap" in *BRM Developer's Reference*.

Verifying Access between the Primary Installation Machine and the Primary Database Schema

Perform the following procedure on the primary installation machine to verify that it can connect to the primary database schema:

1. Log in as user **pin** and open the *BRM_home/sys/test/pin.conf* file in a text editor such as **vi**:

```
su - pin
cd BRM_home/sys/test
vi pin.conf
```

2. Modify the following entries in the **pin.conf** file:

```
- nap cm_ptr ip primary_hostname port_number
- nap login_name login_name
- nap login_pw password
```

where:

- *primary_hostname* is the host name of the primary installation machine.
 - *port_number* is the port number of the primary CM.
 - *login_name* is the login for the primary CM (the default is **root.0.0.0.1**).
 - *password* is the password for the primary CM (the default is **password**).
3. Run the **testnap** utility from the *BRM_home/sys/test* directory, and check for connection errors:

```
testnap
====>database 0.0.0.1 from pin.conf "userid"
q
```

Verifying Access between the Secondary Installation Machines and the Secondary Database Schemas

Perform the following procedure on each secondary installation machine to verify that it can connect to its secondary database schema:

1. Log in as user **pin** open the *BRM_home/sys/test/pin.conf* file in a text editor such as **vi**.
2. Modify the following entries in the **pin.conf** file:

```
- nap cm_ptr ip secondary_hostname port_number
- nap login_name login_name
- nap login_pw password
```

where:

- *secondary_hostname* is the host name of the secondary installation machine.
 - *port_number* is the port number of the secondary CM.
 - *login_name* is the login for the secondary CM (the default is **root.0.0.0.2**).
 - *password* is the password for the secondary CM (the default is **password**).
3. Run the **testnap** utility from the *BRM_home/sys/test* directory, and check for connection errors:

```
testnap
====>database 0.0.0.2 from pin.conf "userid"
q
```

Installing Multidatabase Manager on the Primary Installation Machine

To install Multidatabase Manager, perform the following procedure on the primary installation machine:

1. Download the Multidatabase Manager software package (**7.5.0_MultiDBMgr_platform_opt.bin**) for the appropriate platform from the Oracle software delivery Web site (<http://edelivery.oracle.com>) 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"](#).
-

2. Stop all BRM processes. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
3. Go to the directory where you installed the Third-Party package (by default, */opt/portal/ThirdParty*), 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
```

4. Go to *temp_dir* and enter the following command:

```
7.5.0_MultiDBMgr_platform_opt.bin
```

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.

5. Follow the instructions displayed during installation. The default installation directory for Multidatabase Manager is **opt/portal/7.5**.

Note: Because BRM is already installed on the primary installation machine, the installation program automatically installs the Multidatabase Manager package in *BRM_home*.

6. Go to the directory where you installed Multidatabase Manager, and source the **source.me** file:

Bash shell:

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

C shell:

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

7. Go to the *BRM_home/setup* directory, and run the **pin_setup** script.
8. Log in as user **pin** and copy the Multidatabase Manager configuration file (*BRM_home/apps/multi_db/pin.conf*) to the *BRM_home/setup/scripts* directory:

```
su - pin
```

```
cp BRM_home/apps/multi_db/pin.conf BRM_home/setup/scripts
```

9. Open the *BRM_home/setup/scripts/pin.conf* file in a text editor such as **vi**.
10. Modify the following entries in the **pin.conf** file:

```
- nap cm_ptr ip primary_hostname port_number  
- nap login_name login_name  
- nap login_pw password
```

where:

- *primary_hostname* is the host name of the primary installation machine.
 - *port_number* is the port number of the primary CM.
 - *login_name* is the login for the primary CM (the default is **root.0.0.0.1**).
 - *password* is the password for the primary CM (the default is **password**).
11. Start the CM and Oracle DM processes.
See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
 12. Run the **testnap** utility from the *BRM_home/setup/scripts* directory, and check for connection errors:

```
testnap
====>database 0.0.0.1 from pin.conf "userid"
q
```

Disabling Creation of Uniqueness Objects

BRM requires unique service login names. The **/uniqueness** objects maintain a list of unique login names across multiple database schemas. The list is used during authentication. You can disable creation of **/uniqueness** objects. For example, you might want to disable creation of **/uniqueness** objects if you use your own authentication software.

To disable creation of **/uniqueness** objects:

1. Open the CM configuration file (*BRM_home/sys/cm/pin.conf*).
2. Edit the following entry:

```
-cm uniqueness_login 1
```

where:

- **0** does not create uniqueness objects.
 - **1** creates uniqueness objects. This is the default.
3. Save the file.
 4. Stop and restart the CM.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Configuring pin_multidb.conf on the Primary Installation Machine

You must enter configuration parameters for your multischema setup in the **pin_multidb.conf** file.

Note: This file is accessible only if you installed Multidatabase Manager for the appropriate platform. See ["Installing Multidatabase Manager on the Primary Installation Machine"](#).

To configure a BRM multischema system:

1. Open the *BRM_home/setup/scripts/pin_multidb.conf* file in a text editor such as **vi**.
2. Modify the configuration entries listed in [Table 8-2](#).

Important: Include a set of **\$PIN_MD_SECONDARY*[x]** entries for each secondary database schema in your system. For example, if your system contains three secondary database schemas, the file should contain a set of **\$PIN_MD_SECONDARY*** entries ending in [0], a set ending in [1], and a set ending in [2].

Table 8–2 *pin_multidb.conf File Entries*

Entry	Description
\$JDBC_JAR_FILE	Specify the location of the JDBC Library: <ul style="list-style-type: none"> For the Oracle 11g database, set it to \$PIN_MD_SQL_BASE/jdbc/lib/ojdbc5.jar. For earlier versions of the database, set it to \$PIN_MD_SQL_BASE/jdbc/lib/classes12.zip.
\$PIN_MD_SQL_PLATFORM	Specify the database software your multischema system uses. Enter 'Oracle'.
\$PIN_MD_SQL_BASE	Set this to \$ORACLE_HOME .
\$PIN_MD_INFRANET_BASE	Specify the directory in which BRM is installed on your primary installation machine. You must change this value if BRM is installed in a directory other than /opt/portal/7.5.0 .
\$PIN_MD_CM_HOST	Enter the machine name where the primary CM is running.
\$PIN_MD_CM_PORT	Enter the primary CM's port number. The default is 11960 . Check the port number by looking in the <i>BRM_home/sys/cm/pin.conf</i> file.
\$PIN_MD_PRIMARY_DBNO	Enter the primary database number. The default is "0.0.0.1".
\$PIN_MD_PRIMARY_OWNER	Enter the name of the primary database schema. The default is "PIN". This value must match the \$PIN_MD_SECONDARY_PARENT_SCHEMA [x] value.
\$PIN_MD_PRIMARY_PASSWD	Enter your password for the primary database schema. The default is "pin".
\$PIN_MD_PRIMARY_DBNAME	Enter the database alias for the primary database schema.
\$PIN_MD_PRIMARY_HOSTNAME	Enter the machine name where the primary Oracle DM is running.
\$PIN_MD_PRIMARY_PORT	Enter the port number for the primary DM. The default is 12950 .

Table 8–2 (Cont.) *pin_multidb.conf* File Entries

Entry	Description
\$PIN_MD_SECONDARY_START_INST	<p>Specify the \$PIN_MD_SECONDARY*[x] array number for the first secondary database schema to add to your system, where <i>x</i> is the array number.</p> <p>For example:</p> <ul style="list-style-type: none"> When initially setting up a multischema system containing three secondary database schemas, set this entry to "0" and set \$PIN_MD_SECONDARY_STOP_INST to "2". This tells the pin_multidb.pl script to configure secondary database schemas based on arrays 0, 1, and 2. When adding secondary database schemas to an existing multischema system, enter the \$PIN_MD_SECONDARY*[x] array number for the first schema being added to the system. For example, if your system contains three secondary database schemas (0, 1, and 2) and you are adding two more schemas, set this entry to "3" and set \$PIN_MD_SECONDARY_STOP_INST to "4". This tells the pin_multidb.pl script to configure secondary database schemas based only on arrays 3 and 4 and to ignore arrays 0, 1, and 2. <p>Note: You must include a set of \$PIN_MD_SECONDARY*[x] entries for each secondary database schema in your system. For example, if your system contains three secondary database schemas, the pin_multidb.conf file should contain a set of \$PIN_MD_SECONDARY* entries ending in [0], a set ending in [1], and a set ending in [2].</p> <p>The default is "0".</p>
\$PIN_MD_SECONDARY_END_INST	<p>Specify the \$PIN_MD_SECONDARY*[x] array number for the last secondary database schema to add to your system, where <i>x</i> is the array number.</p> <p>For example, when you initially set up a multischema system containing three secondary database schemas, enter "2".</p> <p>When adding secondary database schemas to an existing multischema system, enter the \$PIN_MD_SECONDARY*[x] array number for the last schema being added to the system. For example, if your system contains three secondary database schemas (corresponding to arrays 0, 1, and 2) and you are adding two more schemas, enter "4".</p> <p>The default is "0".</p>
\$PIN_MD_SECONDARY_DBNO [x]	Enter the secondary database number. The default is "0.0.0.2".
\$PIN_MD_SECONDARY_OWNER [x]	Enter your user name for the secondary database schema. The default is "PINB".
\$PIN_MD_SECONDARY_PASSWD [x]	Enter your password for the secondary database schema. The default is "pinb".
\$PIN_MD_SECONDARY_DBNAME [x]	Enter the database alias for the secondary database schema.
\$PIN_MD_SECONDARY_HOSTNAME [x]	Enter the machine name where the secondary Oracle DM is running.
\$PIN_MD_SECONDARY_PORT [x]	Enter the DM port number for the secondary database schema.
\$PIN_MD_SECONDARY_PARENT_DBNO [x]	Enter the database number of the primary database schema. The default is "0.0.0.1".
\$PIN_MD_SECONDARY_PARENT_SCHEMA [x]	<p>Enter the name of the primary database schema.</p> <p>This value must match the \$PIN_MD_PRIMARY_OWNER [x] value.</p>

Granting System Privileges to Each Database Schema

You must grant Oracle database system privileges to the primary database schema and each secondary database schema in your system.

To do that, on the primary BMC installation machine, run the following command separately for each database schema:

```
sqlplus system/manager@database_alias
grant create table, create view, create trigger to schema_user_name identified by
password;
Grant succeeded.
commit;
Commit complete.
```

where:

- *database_alias* is the database alias of the schema to which you are granting privileges.
- *schema_user_name* is the user name for the schema to which you are granting privileges.
- *password* is the password for the specified schema user name.

Running pin_multidb.pl on the Primary Installation Machine

The **pin_multidb.pl** script initializes and configures your primary and secondary database schemas.

Running pin_multidb.pl -i

Running the **pin_multidb.pl** script with the **-i** parameter initializes the primary and secondary database schemas. See "pin_multidb" in *BRM System Administrator's Guide*.

To run **pin_multidb.pl -i**, perform the following procedure on the primary installation machine:

1. Log in as user **pin** and open the *BRM_home/apps/multi_db/config_dist.conf* file in a text editor such as **vi**
2. Change the status of all secondary database schemas to **"OPEN"**.

Note: If your system contains multiple secondary database schemas, create a new set of entries for each additional secondary database schema.

```
DB_NO = "0.0.0.1" ;           # 1st database config block.
PRIORITY = 1 ;
MAX_ACCOUNT_SIZE = 100000 ;
STATUS = "OPEN" ;
```

```
DB_NO = "0.0.0.2" ;           # 2nd database config block.
PRIORITY = 1 ;
MAX_ACCOUNT_SIZE = 100000 ;
STATUS = "OPEN" ;
```

3. Save and close the file.
4. Go to the *BRM_home/setup/scripts* directory, and run **pin_multidb.pl -i**:


```
cd BRM_home/setup/scripts
perl pin_multidb.pl -i
```

This starts a series of interactive prompts. Follow the instructions on the screen.

Important: When a prompt instructs you to set up schema qualifications, see ["Setting Up Schema Qualifications"](#) for more information.

5. Verify that **pin_multidb.pl** created the MD_PRIMARY database link between the primary database schema and each secondary database schema by performing the following procedure on *each* secondary database schema:

- a. Log in to the secondary database schema:

```
sqlplus schema_user_name/password@database_alias
```

where:

- *schema_user_name* is the user name for the secondary database schema.
- *password* is the password for the specified schema user name.
- *database_alias* is the BRM database alias of the secondary database schema.

- b. Enter the following SQL command:

```
SQL> select poid_id0 from uniqueness_t@MD_PRIMARY where poid_
id0=1;
```

If the command is successful, the following lines are returned:

```
poid_id0
-----
1
```

If an error is returned, re-create the MD_PRIMARY database link, and then rerun the SQL query:

- a. Log in to the secondary database schema:

```
sqlplus schema_user_name/password@database_alias
```

where:

- *schema_user_name* is the user name for the secondary database schema.
- *password* is the password for the specified schema user name.
- *database_alias* is the BRM database alias of the secondary database schema.

- b. Enter the following SQL command to create the database link:

```
SQL> CREATE DATABASE LINK MD_PRIMARY CONNECT TO $PIN_MD_
PRIMARY_OWNER IDENTIFIED by $PIN_MD_PRIMARY_PASSWD USING '$PIN_
MD_PRIMARY_DBNAME';
```

For information about the \$ entries, see [Table 8–2](#).

- c. Enter the following SQL command to verify that the link was created:

```
SQL> select * from all_db_links;
```

If the command is successful, the MD_PRIMARY database link and any other database links created in the database are returned.

If the command fails, consult your Oracle systems administrator.

6. Check the primary CM's configuration file (*BRM_home/sys/cm/pin.conf*):
 - a. In the following line, verify that *DM_machine* represents the host name of the primary installation machine:

```
- cm dm_pointer 0.0.0.1 ip DM_machine 12950
```
 - b. In the following line at the end of the file, verify that *DM_machine* represents the host name of the secondary installation machine:

```
- cm primary_db 0.0.0.1 / 0
- cm dm_attributes 0.0.0.2 scoped,assign_account_obj,searchable
- cm dm_pointer 0.0.0.2 ip DM_machine 12950
```

Note: Your **pin.conf** file must contain a **dm_pointer** entry for each secondary DM in your system. Verify that any additional **dm_pointer** entries include the correct host name.

Running pin_multidb.pl -f

Important: Complete all on-screen instructions for **pin_multidb.pl -i** before running **pin_multidb.pl -f**.

Running the **pin_multidb.pl** script with the **-f** parameter completes the multischema installation process. It starts the **pin_config_distribution** process, which runs at the frequency you specify.

To complete the multischema installation:

1. On *each* secondary installation machine:
 - a. Open the Oracle DM configuration file (*BRM_home/sys/dm_oracle/pin.conf*) in a text editor such as **vi**.
 - b. Make the data dictionary objects writable by changing the following entries to **1**:

```
- dm dd_write_enable_fields 1
- dm dd_write_enable_objects 1
- dm dd_write_enable_portal_objects 1
```

2. On the primary installation machine, go to the *BRM_home/setup/scripts* directory, and run **pin_multidb.pl -f**:

```
cd BRM_home/setup/scripts
perl pin_multidb.pl -f
```

This starts a series of interactive prompts. Follow the instructions on the screen.

3. Verify that the **pin_config_distribution** process is running. See "pin_config_distribution" in *BRM System Administrator's Guide*.
4. Check the **pin_multidb.log** file for errors.

5. Verify that the following entries are in the configuration file (*BRM_home/sys/cm/pin.conf*) of each secondary CM that needs access to all the schemas in your system.

If they are not in the configuration file, add them to it.

```
- cm primary_db 0.0.0.1 / 0
- cm dm_attributes 0.0.0.1 scoped,assign_account_obj,searchable
- cm dm_pointer 0.0.0.1 ip DM_primary_machine 12950
- cm dm_pointer 0.0.0.x ip DM_secondary_machine 12950
```

where:

- *DM_primary_machine* represents the host name of the primary installation machine.
- *DM_secondary_machine* represents the host name of a secondary installation machine other than the one on which the CM you are configuring resides.

Note: Your *pin.conf* file must contain a **dm_pointer** entry for each secondary DM in your system. Verify that any additional **dm_pointer** entries include the correct host name.

All BRM applications now have multischema capability.

Enforcing the Creation of Unique Account Numbers

You can configure BRM to enforce the creation of unique account numbers. Similar to the **/uniqueness** object, the new **/unique_account_no** object maintains a list of unique account numbers across all BRM database schemas.

To enforce the creation of unique account numbers, perform the following procedure for each CM that you want to have access to all the schemas in your system:

1. Open the CM configuration file (*BRM_home/sys/cm/pin.conf*).
2. Edit the following entry:

```
-cm uniqueness_account_no 0
```

where:

0 does not enforce unique account numbers. This is the default.

1 enforces unique account numbers.

3. Save the file.
4. Stop and restart the CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Setting Up Schema Qualifications

To set up a multischema system, use the following procedure to create schema qualifications that connect each secondary database schema to the primary database schema:

Note: Multidatabase Manager still creates database links between the schemas, but they are used only by the **pin_multidb.pl** script.

After you run **pin_multidb.pl -R all**, to set up schema qualifications:

1. On the primary Oracle DM machine:
 - a. Open the Oracle DM configuration file (*BRM_home/sys/dm_oracle/pin.conf*) in a text editor.
 - b. For each secondary database schema in your system, add the following entry:

```
- dm schema db_no schema_name
```

where *db_no* is the database number of the schema and *schema_name* is the name of the schema.

For example, if your system has two secondary database schemas named **pin02** and **pin03**, add the following entries:

```
- dm schema 0.0.0.2 pin02
- dm schema 0.0.0.3 pin03
```

- c. Save and close the file.
 - d. Run the following commands from the UNIX prompt:

```
cd BRM_home/sys/dm_oracle/data
sqlplus login/password@ORACLE_SID
create_procedures_character_set.plb
grant_permissions_oracle.plb
call grant_permissions('secondary_schema_name');
```

where:

- * *login* is the user name for the primary database schema.
- * *password* is the password for the specified user name.
- * *ORACLE_SID* is the BRM database alias of the primary database schema.
- * *character_set* specifies the database character set of either **UTF8** or **AL32UTF8**.
- * *secondary_schema_name* is the name of the secondary database schema to which you are granting permissions.

Note: Execute **call grant_permissions('secondary_schema_name')** separately for each secondary database schema in your system.

For example, if your system has primary database schema **pin01** and two secondary database schemas named **pin02** and **pin03**, log in to schema **pin01**, and execute the **call** command twice: once for **pin02** and once for **pin03**.

- e. Stop and restart the primary DM.
See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
2. On *each* secondary Oracle DM machine:
 - a. Open the Oracle DM configuration file (*BRM_home/sys/dm_oracle/pin.conf*) in a text editor.
 - b. For the primary database schema and each of the other secondary database schemas in your system, add the following entry:

```
- dm schema db_no schema_name
```

where *db_no* is the database number of the schema and *schema_name* is the name of the schema.

For example, if your system has schemas named **pin01** (primary), **pin02** (secondary), and **pin03** (secondary), add the following entries:

In the schema pin02 DM configuration file:

```
- dm schema 0.0.0.1 pin01
- dm schema 0.0.0.3 pin03
```

In the schema pin03 DM configuration file:

```
- dm schema 0.0.0.1 pin01
- dm schema 0.0.0.3 pin02
```

- c. Delete or comment out any **db_link** entries to the primary database schema. For example:

```
# - dm db_link MD_PRIMARY
```

Important: A secondary DM cannot access the primary database schema by using both a schema qualification and a database link. If both entries are set, the DM reports an invalid configuration error.

- d. Save and close the file.
- e. Run the following commands from the UNIX prompt:

```
cd BRM_home/sys/dm_oracle/data
sqlplus login/password@ORACLE_SID
create_procedures_character_set.plb
grant_permissions_oracle.plb
call grant_permissions('schema_name');
```

where:

- * *login* is the user name for the secondary database schema associated with the DM you are configuring.
- * *password* is the password for the specified user name.
- * *ORACLE_SID* is the BRM database alias of the secondary database schema.
- * *schema_name* is the name of the schema to which you are granting permissions.

Note: Execute `call grant_permissions('schema_name')` separately for the primary database schema and for each of the other secondary database schemas in your system.

For example, if your system has schemas named **pin01** (primary), **pin02** (secondary), and **pin03** (secondary), do the following:

- Log in to **pin01**, and run the call command for **pin02** and then for **pin03**.
 - Log in to **pin02**, and run the call command for **pin01** and then for **pin03**.
 - Log in to **pin03**, and run the call command for **pin01** and then for **pin02**.
-
-

- f. Stop and restart the secondary DM.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

What's Next?

Your BRM system now has multischema capability. You can install the BRM client applications and start creating your accounts. See "[Installing BRM Client and Server Applications on Windows](#)".

For information on how to manage your multischema system, such as setting database schema priority and status, see "Managing a Multischema System" in *BRM System Administrator's Guide*.

Installing BRM Client and Server Applications on UNIX

This chapter describes how to install the following Oracle Communications Billing and Revenue Management (BRM) applications on UNIX.

- Developer Center
- Event Extraction Manager
- BRM SDK
- PCM SDK
- Self-Care Manager

Installing Applications and Tools

You download the software by using a Web browser. If your server is not running a Web browser, you can download and extract the software to a PC and then use FTP to transfer the file to the server.

1. Download the software to a *temp_dir*.
2. Save the **.tar.Z** file to a temporary directory (*temp_dir*).
3. Log in as user **pin**.
4. Go to *temp_dir* and uncompress and extract the **.tar.Z** file.

Installing Developer Center

To install Developer Center:

1. Go to *temp_dir* file.
2. Open the **setup.cnf** file with any text editor. The default version of the file contains the following configuration information:

```
INSTALL_PATH=/opt/portal/7.5/DevCenter
MAIN_CM_HOSTNAME=__ENTER_INFORMATION__
MAIN_CM_PORT=11960
JRE_Path=$INSTALL_PATH
```

3. (Optional) To change the default installation directory of **/opt/portal/7.5/DevCenter**, specify a new path in the **INSTALL_PATH** entry.
4. Replace:
 - **MAIN_CM_HOSTNAME** to your BRM system host.

- (Optional) Set `MAIN_CM_PORT` to your BRM system port number.
5. Set the JRE path if it is different from the default.
 6. Save and close the file.
 7. Run the following command:

```
% ./install.ksh
```

The application is installed in the directory specified in the `setup.cnf` file.

Installing Event Extraction Manager

For more information about Event Extraction Manager, see "Using Event Extraction Manager" in *BRM Setting Up Pricing and Rating*.

The default installation automatically installs all three applications on your system. To install only Event Extraction Manager, use the custom install.

Note: If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

To install Event Extraction Manager:

1. Install 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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).
-
-

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 run the following command:

```
7.5.0_RatedEventLoader_platform_opt.bin
```


where *platform* is the operating system UNIX.

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. Select **Custominstall** when asked to specify the setup type.
5. Enter the number of **EventExtractionTool** and click **Next**.
6. Follow the instructions displayed during installation. The default installation directory for Event Extraction Manager is **opt/portal/7.5**.

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

7. Go to the directory where you installed Event Extraction Manager and source the **source.me** file:

Bash shell:

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

C shell:

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

8. Go to the *BRM_Home/setup* directory and run the **pin_setup** script.

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

Your Event Extraction Manager installation is now complete.

Installing BRM SDK

For more information about BRM SDK, see "Using BRM Developer Tools" in *BRM Developer's Guide*.

You can install BRM SDK independently of the BRM server, making it possible to isolate development activities from production servers. For example, you can install BRM SDK on each of the computers used by BRM developers at your site. These developers can share access to test and production BRM servers.

Though installing BRM SDK on BRM servers is not necessary, doing so has some advantages. For example, installing the SDK on your BRM server gives you access to sample applications that are not included in the server installation.

Important:

- To use BRM SDK, you must have access to a test installation of BRM. Use the test installation to verify the functionality of new or customized components before deploying them to your production BRM installation. See "Testing New or Customized Components" in *BRM Developer's Guide*.
 - If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.
-

To install BRM SDK:

1. Install 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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).
-

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 run the following command:

```
7.5.0_Portal_SDK_platform_opt.bin
```

where *platform* is the Linux.

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. When prompted, enter the directory where you want to install BRM SDK.

The default directory is **opt/portal/7.5/PortalDevKit**.

The installation program installs BRM SDK files in the specified directory.

Note:

- The installation directory is called *BRM_SDK_Home* in the documentation.
 - Do not install BRM SDK in the directory in which you installed BRM or any other optional component.
-

5. Go to *BRM_SDK_Home* and source the **source.me** file:

Bash shell:

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

C shell:

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

Your BRM SDK installation is now complete.

Uninstalling BRM SDK

To uninstall BRM SDK:

1. Go to *BRM_SDK_Home/uninstaller/Portal_SDK* directory.
2. Run the following command: **uninstaller.bin**

Note: The uninstallation does not uninstall any compiled BRM SDK policy files. Remove these file manually.

Installing PCM SDK

For more information about Portal Communications Module (PCM) SDK, see "Using BRM Developer Tools" in *BRM Developer's Guide*.

You can install PCM SDK independent of the BRM server, making it possible to isolate development activities from production servers. For example, you can install PCM SDK on each of the computers used by BRM developers at your site. These developers can share access to test and production BRM servers.

Though installing BRM SDK on BRM servers is not necessary, doing so has some advantages. For example, installing the SDK on your BRM server gives you access to sample applications that are not included in the server installation.

Important:

- To use PCM SDK, you must have access to a test installation of BRM. Use the test installation to verify the functionality of new or customized components before deploying them to your production BRM installation. See "Testing New or Customized Components" in *BRM Developer's Guide*.
 - If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.
 - Third-Party software and BRM SDK must be installed before you install PCM SDK, otherwise the installation of PCM SDK will fail.
-

To install PCM SDK:

1. Install the software to (*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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).
-

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 run the following command:

```
7.5.0_PCM_SDK_platform_opt.bin
```

where *platform* is the Linux.

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.
- PCM SDK is automatically installed in the same directory as BRM SDK. The default directory for installing BRM SDK is **opt/portal/7.5/PortalDevKit**.

4. Go to *BRM_SDK_Home* and source the **source.me** file:

Bash shell:

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

C shell:

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

Your PCM SDK installation is now complete.

Uninstalling PCM SDK

To uninstall PCM SDK:

1. Go to *BRM_SDK_Home/uninstaller/PCM_SDK* directory.
2. Run the following command: **uninstaller.bin**

Note: The uninstallation does not uninstall any compiled PCM SDK policy files. Remove these files manually.

Installing Self-Care Manager

To use Self-Care Manager, you must also install a third-party application server:

To install Self-Care Manager:

1. Install an Application Server:
Supported application servers include Tomcat, WebLogic, and WebSphere. For more information, see the vendor installation documents for instructions on installing the application server.
2. On the machine on which you have installed the application server, download the Self-Care Manager files by following the [Installing Applications and Tools](#).
3. In the temporary directory where you downloaded the Self-Care Manager **.tar** file, open the **setup.cnf** file with any text editor. The default version of the file contains this configuration information:

```
INSTALL_PATH=/opt/portal/7.5/WebKit
MAIN_CM_HOSTNAME=__ENTER_INFORMATION__
MAIN_CM_PORT=11960
```

4. (Optional) To change the default installation directory of **/opt/portal/7.5/WebKit**, specify a new path in the **INSTALL_PATH** entry.

Note: You can install Self-Care Manager in any location.

5. Replace **MAIN_CM_HOSTNAME** to your BRM system host.
6. (Optional) Set **MAIN_CM_PORT** to your BRM system port number.
7. Save and close the file.
8. Run the following command:

```
% ./install.ksh
```

The application is installed in the directory specified in the **setup.cnf** file.

After installing the Self-Care Manager files, configure the application server to work with Self-Care Manager. See "Configuring the Application Server" in *BRM Managing Customers*.

What's Next?

After installing the BRM server and client applications, test BRM with your business models:

- For an overview of setting up price lists, see "Setting Up Price List Data" in *BRM Setting Up Pricing and Rating*.
- For an overview of setting up billing, see "Setting Business Policies for Billing" in *BRM Configuring and Running Billing*.
- For an overview of setting up customer registration and managing customer accounts, see "Customizing Registration" in *BRM Managing Customers* and "About Registering Customers" in *BRM Concepts*.

Installing BRM Client and Server Applications on Windows

This chapter describes how to install Oracle Communications Billing and Revenue Management (BRM) applications on Windows.

Note: The BRM server components (Connection Manager (CM), Data Manager (DM), and so on) do not run on Windows systems.

About BRM Client and Server Applications for Windows

The BRM system includes several client applications that provide graphical user interfaces to the data in the BRM database. You use BRM client applications to manage customers and payments and to configure your BRM system. See "About the BRM Client Applications" in *BRM Concepts*.

The BRM system also includes one server application, Self-Care Manager, that provides customer self-care services using Web browsers and wireless devices. Customers use Self-Care Manager to display and modify their account data. See "About Self-Care Manager" in *BRM Managing Customers*.

You can install BRM applications in any combination and in any order; however, you *must first install BRM*. See ["BRM Installation Overview"](#).

Required Disk Space for BRM Windows Applications

[Table 10–1](#) lists the approximate disk space required to download, extract, and install each client application.

Note: BRM client applications require the Java Runtime Environment (JRE). The JRE is included in each application package and is approximately 50 MB. Once the JRE is installed with a BRM application, it will not be reinstalled.

Table 10–1 Required Disk Space for Windows Applications

Application	Type	Required Disk Space
Brand Manager	Client application	100 MB
Business Configuration Center	Client application	100 MB
Collections Configuration	Client application	100 MB

Table 10–1 (Cont.) Required Disk Space for Windows Applications

Application	Type	Required Disk Space
Customer Center	Client application	125 MB
Customer Center SDK	Developer tool	54 MB
Developer Center	Developer tool	110 MB
Payment Tool*	Client application	140 MB
Permissioning Center	Client application	112 MB
Pricing Center	Client application	165 MB
Self-Care Manager	Server application	100 MB

* Payment Center is installed with Payment Tool. It is accessible only if you purchase the Payment Suspense Manager feature.

Installing BRM Client Applications on Windows

This section describes how to install and start all BRM client applications except Customer Center and Pricing Center.

To install Customer Center, see ["Installing Customer Center on Windows"](#).

To install Pricing Center, see ["Installing Pricing Center on Windows"](#).

Before Installing BRM Client Applications

To install the BRM client applications, you need the following:

- An application such as WinZip for extracting compressed files.
- The following information about the machine running the CM to which Customer Center, Payment Tool, Payment Center, and Pricing Center will connect:
 - Computer or server name
 - Port number
 - Database number
- Windows users must have administrator privileges to install Customer Center, Payment Tool, or Pricing Center.
- A supported version of the 32-bit JDK installed. For 64-bit systems, confirm that the JDK location is included in your path, or in the standard **C:\Program Files (x86)\Java** location on Windows.

For information on localized versions of the client applications, see "Creating a Localized Version of BRM" in *BRM Developer's Guide*.

Downloading the Compressed Files

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

Important: To install Payment Center, download and install the **PaymentTool.zip** file.

2. Extract the files in the **.zip** file to a temporary directory.

Installing the Software

For information on installing Customer Center, see "[Installing Customer Center on Windows](#)".

For information on installing Pricing Center, see "[Installing Pricing Center on Windows](#)".

To install all other client applications:

1. Follow the steps in "[Downloading the Compressed Files](#)".
2. Go to the temporary directory where you extracted the client application download file.
3. Double-click **Setup.exe**.
4. On the Choose Destination Location screen, select the destination folder for the program and click **Next**.
5. On the Connection Manager screen, enter the server, port, and database information and click **Next**.

For a demonstration system, enter the server name (computer where you installed the CM) and accept the default values of **11960** and **0.0.0.1**.

6. On the Select Program Folder screen, accept the default program folder **Portal** or select a new one; click **Next**.
7. On the Start Copying Files screen, click **Next** to start installing the application.
8. On the Setup Complete screen, you can choose to restart the computer or wait until you have installed all the applications.
9. Click **Finish** to complete the process.

Starting and Using a BRM Client Application

This procedure applies to any BRM client application, but there are additional ways to start Customer Center and Pricing Center. See "[Starting Customer Center](#)" and "[Starting Pricing Center](#)".

To start a client application:

1. From the start options, choose *ProductName*, which is under **Portal**, where *ProductName* is the BRM client application you want to start.

The Login dialog box appears.

2. Enter your login name and password.

For information on login names and passwords for client applications, see "Implementing System Security" in *BRM System Administrator's Guide*.

3. To connect to a database other than the one specified during installation, click **Connection Info** and enter the host name and port number.
4. Click **OK**.

For information on how to use a client application, see the Help for that application.

Running Payment Tool on Windows 7 and Windows 8.1

On Windows 7 and Windows 8.1, Payment Tool must be run as an administrator. See the Windows 7 or Windows 8.1 online Help for information.

Installing Customer Center on Windows

To install Customer Center, see the following:

- [About Installing and Running Customer Center](#)
- [Before Installing Customer Center](#)
- [Installing the Customer Center Files](#)
- [Installing Java Web Start and Downloading Customer Center](#)
- [Starting Customer Center](#)
- [Uninstalling Customer Center from a Client System](#)

About Installing and Running Customer Center

You must install Customer Center on a system with a Web server. You then use the Web server and Java Web Start technology to distribute Customer Center to your CSRs.

To use Customer Center, CSRs download it from the Web server to their Windows client systems. When CSRs run Customer Center, they run their local versions that communicate directly with the BRM database.

Each time a CSR runs Customer Center, the application uses Java Web Start to check the Web server for updates and automatically download new versions.

Note: You can *install* Customer Center on either a UNIX or Windows system, but Customer Center can be *run* only on a Windows system.

Before Installing Customer Center

- Obtain the following information about the machine running the CM to which Customer Center will connect:
 - Computer or server name
 - Port number
 - Database number

- Make sure you have Windows administrator privileges.
- Install a third-party Web server.
- Make sure each Customer Center client system has a Web browser.

For a list of supported browsers, see "[BRM Software Compatibility](#)".

- Optionally, you can install the Java Runtime Environment (JRE) 1.6.0_26 on each client system. If you do not do it in advance, JRE 1.6.0_26 will be installed as part of downloading Customer Center.

See "[Installing Java Web Start and Downloading Customer Center](#)".

- To display decimals to the desired precision, ensure that your regional settings are properly defined.
- If you have not already downloaded and extracted the client application, follow the steps for "[Downloading the Compressed Files](#)".

Installing the Customer Center Files

Install Customer Center on the same system as your Web server.

1. Go to the temporary directory where you unzipped the client application download file.
2. Double-click **Setup.exe**.
3. Enter a destination folder. You can enter your Web server's document root directory, such as **C:\Program Files\Apache Group\Apache\htdocs** on an Apache Web server or choose one of the following default installation paths:

For Windows XP:

C:\Program Files\Portal Software\CustomerCenter

For Windows 7 and 8.1:

C:\Program Files (x86)\Portal Software\CustomerCenter

You can also enter a subdirectory of your Web server's document root directory or another directory that you map to your Web server.

4. Enter the name and port number of the BRM server where the CM is running.
5. Enter the database number for the DM (for example, **0.0.0.1**).
6. Enter the full URL to the location of Customer Center on your Web server. The default URL is **http://machine_name** where *machine_name* is the name of the system where you are installing Customer Center.

Important: Your Web server must be mapped to the URL you specify.

Specify the URL as follows:

- If you are installing Customer Center in your Web server's document root directory, or a directory mapped to your Web server's document root directory, use the default URL.
- If you are installing Customer Center in a subdirectory of your Web server's document root, add the subdirectory names to the default URL. But do not change the top-level URL.

For example, if your default URL is **http://server1**, and you install Customer Center in the **applications** subdirectory of your document root, your URL should be **http://server1/applications**.

- If you are installing Customer Center in a directory outside your Web server directory, map that installation directory to a subdirectory of your document root. Then add the name of the subdirectory of the document root to the default URL.

For example, you can install Customer Center in **C:\Program Files\Portal Software\CustomerCenter**, and then map that directory to the **applications** subdirectory of the Web server document root. If your default URL is **http://server1**, your URL should be **http://server1/applications**.

- If your Web server uses a port number other than 80, add the port number to the URL as follows: *URL:port_number*.

For example, if your Customer Center URL is **http://server1** and your port number is 81, your URL should be **http://server1:81**.

See your Web server documentation for information on the document root directory and mapping other directories to your URL.

Note: To access Customer Center, add the file name **CustomerCenter_en.html** to the URL you specify here. Do not add the file name on this screen.

7. For Apache and iPlanet Web servers, open your Web server's MIME types file to add an entry for JNLP, a special file type associated with Java Web Start. For IIS Web servers, you do not need to do this.

Add a MIME type as follows:

- For an Apache Web server, add the following entry to the **mime.types** file:
application/x-java-jnlp-file JNLP
- For an iPlanet Web server, add the following entry to the **mime.types** file:
type=application/x-java-jnlp-file exts=JNLP

You can also use the iPlanet Server Manager to add a MIME type.

For more information, see your Web server documentation.

8. For iPlanet Web servers only, edit the **mime.types** file for your Web server to enable downloading of **.exe** files. This is necessary so that client systems can download the Java Web Start installation file from the Web server.

Change the **.exe** file extension's MIME type association as follows:

- Remove **exe**, and the comma before it, from this line:
type=magnus-internal/cgi exts=cgi,bat,exe
- Add **exe**, preceded by a comma, to the end of this line:
type=application/octet-stream exts=bin,exe

You can also make this change with the iPlanet Server Manager. See the iPlanet documentation.

9. Stop and restart your Web server.

Setting the Heap Size for Java Web Start

To set the heap size for Java Web Start implementations:

1. Open your **CustomerCenter_locale.jnlp** file.
2. Change the **j2se** element to set the initial and maximum heap size.

The default entry looks like this:

```
<j2se version="1.4*" />
```

For example, this entry changes the initial heap size to 128 megabytes and the maximum heap size to 256 megabytes:

```
<j2se version="1.4*" initial-heap-size="128m" max-heap-size="256m" />
```

Note: The heap sizes specified in the JNLP file is used for all associated Customer Center clients.

3. Stop and restart Customer Center to make the change take effect.

Installing Java Web Start and Downloading Customer Center

The first time you start Customer Center on a client system, you download and install Java Web Start.

Note: With Internet Explorer, you have the option of installing directly from the server without downloading the file.

1. Go to this URL in your Web browser:

`http://machine_name/CustomerCenter_en.html`

Replace *machine_name* with the name of the system running the Web browser and Customer Center. If Customer Center is located in a subdirectory of your Web browser's document root directory, include the full path to **CustomerCenter_en.html**.

If your Web server uses a port number other than the default of 80, include the port number in the URL:

`http://machine_name:port_number/CustomerCenter_en.html`

For example, if Customer Center is on a system called server1 using port 81, go to this URL: **`http://server1:81/CustomerCenter_en.html`**.

The browser begins downloading the Java Web Start installation file, **javawebstart-install.exe**.

Note:

- If your Web server uses default port 80, specifying the port number is optional. Otherwise, you must include the port number.
 - If your Web server does not display the page correctly or does not start downloading the Java Web Start installation file, make sure you set the JNLP MIME type in your Web server. See "[Installing the Customer Center Files](#)".
 - If the MIME type is set in your Web server, try clearing the cache in your Web browser. For Internet Explorer, delete temporary Internet files. For Netscape, clear the memory cache and the disk cache.
-

2. Choose the directory to save the installation file, then save the file.
3. Go to the temporary directory where you saved the Java Web Start installation file.
4. Double-click **javawebstart-install.exe** and follow the prompts in the installer.

Note:

- If you do not have JRE 1.6.0.26 installed, Java Web Start installs it.
- If you are using a Netscape browser, Java Web Start prompts you to restart your browser at the end of the installation.
- Java Web Start might prompt you to restart your system.

5. **(For Netscape 6 only)** In Netscape, choose **Edit - Preferences - Navigator - Helper Applications** and create a new MIME type using the values in [Table 10–2](#):

Table 10–2 Netscape MIME Values

Parameter	Value
File Extension	jnlp
MIME Type	application/x-java-jnlp-file
Application to Use	javaws.exe , located in your Java Web Start installation directory, such as C:\Program Files\Java Web Start

6. Stop and restart Netscape.
7. In your Web browser, return to the Customer Center URL (**http://machine_name:port_number/CustomerCenter_en.html**) and click the link for running Customer Center.
Java Web Start launches and copies the Customer Center files from the Web server.
8. In the Security dialog box that asks whether you want to install and run Customer Center, click **Start**.

For more information on using Java Web Start, see the Java Web Start documentation at java.sun.com.

Starting Customer Center

After installing Java Web Start and running Customer Center for the first time, you can start Customer Center in any of these ways:

- Java Web Start.
See "[Starting Customer Center from Java Web Start](#)".
- Browser.
See "[Starting Customer Center from Your Browser](#)".

Using any of these methods, if there's a newer version of the Customer Center files on the Web server, Java Web Start installs them on your system.

Starting Customer Center from Java Web Start

To start Customer Center from the Java Web Start Application Manager:

1. Start Java Web Start from the start options.
2. If you do not see Customer Center listed in the Application Manager, choose **View - Downloaded Applications**.
3. Select Customer Center and click **Start**.

Starting Customer Center from Your Browser

To start Customer Center from your browser, go to the URL **http://machine_name:port_number/CustomerCenter_en.html**.

This URL automatically starts Java Web Start, which in turn starts Customer Center.

Uninstalling Customer Center from a Client System

To remove a version of Customer Center that has been downloaded to a client system:

1. Start Java Web Start from the start options.
2. If you do not see Customer Center listed in the Application Manager, choose **View - Downloaded Applications**.
3. Select Customer Center.
4. Choose **Application - Remove Application**.

Installing GSM Manager Customer Center Extension on Windows

For more information about the GSM Manager components, see "About the GSM Manager Components" in *BRM Telco Integration*.

GSM Manager Customer Center Extension enables support for assigning SIM cards and telephone numbers in Customer Center. See the discussion about setting up GSM services in Customer Center Help.

Important: You must install the GSM Manager Customer Center Extension on a system that already has Customer Center installed. See "[Installing Customer Center on Windows](#)".

To install GSM Manager Customer Center Extension:

1. Download the software to a temporary directory (temp_dir).
2. Extract the downloaded .zip file to a temporary directory (temp_dir).
3. Go to temp_dir and run the **setup.exe** program. The installation wizard for GSM Manager Customer Center Extension starts.
4. Answer the prompts in the installation wizard screens.

Your GSM Manager Customer Center Extension installation is now complete.

Installing Pricing Center on Windows

To install Pricing Center, see the following sections:

- [About Installing and Running Pricing Center](#)
- [Before Installing Pricing Center](#)
- [Installing the Pricing Center Files](#)
- [Installing Java Web Start and Downloading Pricing Center](#)
- [Granting Administrative Privileges to Pricing Center Users](#)
- [Starting Pricing Center](#)
- [Uninstalling Pricing Center from a Client System](#)

- [Uninstalling Pricing Center from Windows](#)

About Installing and Running Pricing Center

Pricing Center can be installed as a standalone application or on a system with a Web server.

- If you will use Pricing Center as a standalone application on a single system, install the standalone version.
- If you are installing with a Web server, you use the Web server and Java Web Start technology to distribute Pricing Center to your CSRs.

To use Pricing Center, CSRs download it from the Web server to their Windows client systems. When CSRs run Pricing Center, they run their local versions that communicate directly with the BRM database.

Each time CSRs run Pricing Center, the application uses Java Web Start to check the Web server for updates and to automatically download any new versions it finds.

Note: When you install Pricing Center, you also automatically install the Resource Editor and the Zone Mapper.

Before Installing Pricing Center

- Obtain the following information about the machine running the CM to which Pricing Center will connect:
 - Computer or server name
 - Port number
 - Database number
- Make sure you have Windows administrator privileges.
- Install a third-party Web server.
- Make sure each Pricing Center client system has a Web browser.

For a list of supported browsers, see "[BRM Software Compatibility](#)".
- Optionally, you can install JRE 1.6.0_26 on each client system. If you do not do it in advance, JRE 1.6.0_26 will be installed as part of downloading Pricing Center.

See "[Installing Java Web Start and Downloading Pricing Center](#)".

Installing the Pricing Center Files

Important: Install Pricing Center on the same system as your Web server.

1. Follow the steps for "[Downloading the Compressed Files](#)".
2. Go to the temporary directory where you unzipped the client application download file.
3. Double-click **Setup.exe**.
4. When the Welcome screen appears, click **Next**.

The Choose Destination Location window opens.

5. Click **Next** to choose the default directory, or use the **Browse** button to choose a different directory and then click **Next**.

The Install Type window opens.

6. On the Install Type window, choose one of the following:

- **Standalone install**

If you will use Pricing Center as a standalone application on a single system, select **Standalone install** and click **Next**.

The Install Sample Price Plans window opens.

Sample price plans are selected by default. To install them, click **Next**. To skip installing sample price plans, clear the check box, then click **Next**.

The Enable Pipeline Rating Feature window opens. Skip to the next step.

- **Web server install**

If you are installing Pricing Center on a central server, select **Web server install** and click **Next**.

The Enter the Web Server Name window opens.

Specify the URL as follows:

If you are installing in your Web server's document root directory or in a directory mapped to your Web server's document root directory: Use the default URL.

If you are installing in a subdirectory of your Web server's document root: Add the subdirectory names to the default URL. But do not change the top-level URL.

If you are installing in a directory outside your Web server directory: Map that installation directory to a subdirectory of your document root. Then add the name of the subdirectory of the document root to the default URL.

Enter the URL where you want Pricing Center installed and click **Next**.

The Enable Pipeline Rating Feature window opens.

7. The **Enable pipeline rating feature** check box is selected by default.
 - If you rate events using Pipeline Manager, accept the default selection and click **Next**.
 - If you do not rate events using Pipeline Manager, clear this option and click **Next**.

The Enable Data Migration Functionality window opens.

8. You use the Pipeline Manager data migration feature to move pipeline pricing data from a development system to a production system. For more information on data migration, see Pricing Center Help.

Choose how you want data migration to be handled using the values in [Table 10-3](#):

Table 10-3 Data Migration Configuration Values

Value	Description
Turn OFF Data Migration	Turns off the data migration feature. This is the default.

Table 10–3 (Cont.) Data Migration Configuration Values

Value	Description
Import Only	Gives you the ability to import change set files without enabling the full set of data migration features. This option is useful for production systems where you want to reduce the risk of accidental data changes.
Turn ON Data Migration	Turns on the full set of data migration features so you can manage, import, and export pipeline pricing data.

Click **Next**.

The Select Program Folder window opens.

9. Specify the folder where you want Pricing Center to add program icons and click **Next**.

The Start Copying Files window opens.

10. Click **Next**.

The Pricing Center files are copied to the directory you specified.

When the files have been copied, the Setup Complete window appears.

11. Click **Finish** to complete the setup process.

Installing Java Web Start and Downloading Pricing Center

Important: If you installed Pricing Center as a standalone product, skip this section and go to "[Granting Administrative Privileges to Pricing Center Users](#)".

If you installed the Web Server version of Pricing Center, follow the instructions in this section.

The first time you start Pricing Center on a client system, you download and install Java Web Start.

1. Go to this URL in your Web browser:

`http://machine_name/PricingCenter_en.html`

Replace *machine_name* with the name of the system running the Web browser and Pricing Center. If Pricing Center is located in a subdirectory of your Web browser's document root directory, include the full path to **PricingCenter_en.html**.

If your Web server uses a port number other than the default of 80, include the port number in the URL:

`http://machine_name:port_number/PricingCenter_en.html`

For example, if Pricing Center is on a system called server1 using port 81, go to this URL: **`http://server1:81/PricingCenter_en.html`**.

The browser begins downloading the Java Web Start installation file, **javawebstart-install.exe**. On Internet Explorer, you have the option of installing directly from the server without downloading the file.

Note:

- If your Web server uses default port 80, specifying the port number is optional. Otherwise, you must include the port number.
- If your Web server does not display the page correctly or does not start downloading the Java Web Start installation file, make sure you set the JNLP MIME type in your Web server.
- If the MIME type is set in your Web server, try clearing the cache in your Web browser. For Internet Explorer, delete temporary Internet files. For Netscape, clear the memory cache and the disk cache.

2. Specify the directory where you want the installation file saved, then save the file.
3. Go to the temporary directory where you saved the Java Web Start installation file.
4. Double-click **javawebstart-install.exe** and follow the prompts in the installer.

Note:

- If you do not have JRE 1.6.0_26 installed, Java Web Start installs it.
- If you are using a Netscape browser, Java Web Start prompts you to restart your browser at the end of the installation.
- Java Web Start might prompt you to restart your system.

5. **(For Netscape 6 only)** In Netscape, choose **Edit - Preferences - Navigator - Helper Applications** and create a new MIME type as described in [Table 10-4](#).

Table 10-4 Netscape MIME Values

Parameter	Value
File Extension	jnlp
MIME Type	application/x-java-jnlp-file
Application to Use	javaws.exe , located in your Java Web Start installation directory, such as C:\Program Files\Java Web Start

6. Stop and restart Netscape.
7. In your Web browser, return to the Pricing Center URL (**http://machine_name:port_number/PricingCenter_en.html**) and click the link for running Pricing Center.
Java Web Start launches and copies the Pricing Center files from the Web server.
8. In the Security dialog box that asks whether you want to install and run Pricing Center, click **Start**.

For more information on using Java Web Start, see the Java Web Start documentation at java.sun.com.

Granting Administrative Privileges to Pricing Center Users

You use the **pricing_admin.pl** script to grant administrative privileges to Pricing Center users. Users with administrative privileges are called *pricing admins*.

To grant administrative privileges to Pricing Center users, perform the procedures in the following sections:

1. [Modifying the Database Configuration File](#)
2. [Modifying the pricing_admin.pl Script Configuration File](#)
3. [Setting Up the Database Server for the Pipeline Manager Administrator](#)
4. [Configuring Pricing Center for Branding](#)
5. [Initializing the Pricing Admin Configuration Object](#)
6. [Specifying Administrative Privileges for Pipeline Manager Users](#)
7. [Removing Pricing Admins](#)

Modifying the Database Configuration File

1. Go to the DM directory:

```
cd BRM_Home/sys/dm_oracle
```

2. Back up the database configuration file (**pin.conf**).

Important: You will be restoring the **pin.conf** file later in the procedure.

3. Open the **pin.conf** file with a text editor.
4. If the **dd_write_enable_objects** entry is set to 0, set the entry to 1.
5. If the **crypt** entry is commented out, uncomment it and configure it according to the notes that precede this entry:

```
- crypt md5| BRM_Home/lib/libpin_crypt4dm.so "secret_key"
```

For more information, see "About Encrypting Information" in *BRM Developer's Guide*.

6. Save and close the file.
7. Stop and restart the DM and CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Modifying the pricing_admin.pl Script Configuration File

1. Go to the *BRM_Home\setup\scripts* directory.
2. Open the setup configuration file (**pin.conf**) file with a text editor.
3. Check that the following entries are specified in the **pin.conf** file:

```
- nap login_type 1
- - userid 0.0.0.1 /service/admin_client 1
```

4. Specify appropriate values for the **login_name** and parameters:

```
- nap login_name login_name
- nap login_pw password
```

For example:

```
- nap login_name integrate
- nap login_pw integrate
```

5. Enter the host name and port number of your server in the **cm_ptr** entry:
 - `nap cm_ptr ip host_name port_number`
6. Specify values for the entries described in Table 10–5. These entries specify Pipeline Manager configuration data used by the **pricing_admin.pl** script to set up and maintain pricing admins and the Pipeline Manager database for Pricing Center.

Table 10–5 Pipeline Manager Configuration Data

Entry	Description
default_table_space_name	<p>The tablespace that newly created Oracle users are assigned to. The default is INTEGRATE_TS_1_DAT.</p> <p>If the default tablespace is not available in the Pipeline Manager database, use an available existing tablespace or create a new one.</p> <p>Important: You must specify a value for default_table_space_name before you run the pricing_admin.pl script with the -set parameter.</p>
database_role_name	<p>The role that provides select, insert, delete, and update privileges on IFW_* and JSA_* tables. The default is INTEGRATE_ROLE_ALL.</p> <p>If the default role is not available in the Pipeline Manager database, use an existing role that provides these privileges or create a new role.</p> <p>If you use the -init parameter, the entry is optional.</p>
host	The host name for the server where the Pipeline Manager database is located and running.
port	The port number used by the Pipeline Manager database listener.
db	<p>The name of the Pipeline Manager database instance.</p> <p>Note: You must set the db value to the ORACLE_SID value. If you set the db value to the SERVICE_NAME value, BRM does not generate an error when creating the /config/pricing_admin object; however, you cannot connect to the Pipeline Manager database from Pricing Center.</p>
db_type	The name of the database vendor. The value should be one of the system database driver groups of entries in the jsaconf.properties file, for example, oracle .
login_name	<p>The default Pipeline Manager database user name.</p> <p>Important: You must specify a value for login_name before you run the pricing_admin.pl script with the -init parameter.</p>
login_pw	<p>The password of the default Pipeline Manager database user.</p> <p>Important: You must specify a value for login_pw before you run the pricing_admin.pl script with the -init parameter.</p>
admin	The DBA on the Pipeline Manager database that has user creation privileges.
admin_pw	The password of the DBA account.
db_alias	<p>The alias used to log in to the Pipeline Manager database.</p> <p>Important: Ensure that the tnsnames.ora file also contains an entry with this alias.</p>

Example 10–1 Sample pin.conf Entry Value

```

- pipeline default_table_space_name    INTEGRATE_TS_1_DAT
- pipeline database_role_name          INTEGRATE_ROLE_ALL
- pipeline host                        ttal-013
- pipeline port                        1521
- pipeline db                          pindb

```

- pipeline db_type	oracle
- pipeline login_name	integrate
- pipeline login_pw	integrate
- pipeline admin	system
- pipeline admin_pw	manager
- pipeline db_alias	ttal

Note: To ensure that Pricing Center can connect to the server, add the name and IP address of the Pipeline Manager host system to the host file of each machine running Pricing Center.

7. Save and close the file.

Setting Up the Database Server for the Pipeline Manager Administrator

To set up an Oracle database server for the Pipeline Manager administrator:

1. Edit the **tnsnames.ora** file to specify HOST, PORT, and SERVICE_NAME values. Use the same values that you used for the **host**, **port**, and **db** entries in the setup configuration file (*BRM_Home\setup\scripts\pin.conf*).

The following is the required name entry in the **tnsnames.ora** file that corresponds to the sample **pin.conf** file shown in Step 6 of "[Modifying the pricing_admin.pl Script Configuration File](#)".

Note: The DB alias in the following example is **ttal-013**, the port name is **1521**, and the Pipeline Manager database name (SERVICE_NAME) is **pindb**. Be sure to change these values to match your environment.

```
TTAL-013 =
(DESCRIPTION =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP) (HOST = ttal_013) (PORT = 1521) )
  )
  (CONNECT_DATA =
    (SERVICE_NAME = pindb)
  )
)
```

2. To ensure that the **pin.conf** entries for **admin**, **admin_pw**, **db_alias**, and **host** are correct, try connecting to the Pipeline Manager database using the following command:

```
sqlplus admin/admin_pw@db_alias
```

Configuring Pricing Center for Branding

If your system uses branding and you use pipeline pricing components:

1. Open the **pricing_admin.sce** scenario file located in *BRM_Home\setup\scripts*.
2. Change the PIN_FLD_READ_ACCESS value from **Self** to **Global**:

```
PIN_FLD_READ_ACCESS          STR [0] "Global"
```

3. Save and close the file.

Initializing the Pricing Admin Configuration Object

Initialize the pricing admin configuration object by running the **pricing_admin.pl** script:

1. Go to the *BRM_Home\setup\scripts* directory.
2. Run the **pricing_admin.pl** script with the **-init** parameter:

```
perl pricing_admin.pl -init
```

If initialization is successful, the system returns this line:

```
Initialized config object for pricing admin.
```

3. Restore the original database configuration file (**pin.conf**) that you backed up in ["Modifying the Database Configuration File"](#).
4. Stop and restart the DM to apply the new settings. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Specifying Administrative Privileges for Pipeline Manager Users

To specify administrative privileges for Pipeline Manager users:

1. Ensure that every Pipeline Manager user who will be a pricing admin has a CSR account in BRM (an account using the **admin_client** service). You create CSR accounts in Customer Center by using the CSR Plan. See information about the Account Creation wizard's Contact page in Customer Center Help.
2. Create a text file that has the user name and password (in that order) of each pricing admin on a separate line. User names and passwords must be separated by a space. For example:

```
john_jones valhalla
mary_allen dorado
```

Important: BRM user names (login names) are case sensitive, but Pipeline Manager user names are not. Therefore, be sure to type the names exactly as specified in Customer Center, but avoid using names that are too similar. For example, do not create two accounts with the user names "Smith" and "smith" because they will both be logged in to the Pipeline Manager as "SMITH."

3. Go to the *BRM_Home\setup\scripts* directory.
4. Run the **pricing_admin.pl** script with the **-set** parameter:

```
perl pricing_admin.pl -set < text_file
```

where *text_file* is the name of the file you created in Step 2.

5. Delete the text file if security is a concern.

Removing Pricing Admins

This section describes how to remove single and multiple users from the Pipeline Manager database.

Removing One Pricing Admin

To remove one pricing admin from the database:

1. Go to the *BRM_Home\setup\scripts* directory.
2. Run the **pricing_admin.pl** script with the **-remove** parameter:

```
perl pricing_admin.pl -remove
```
3. When prompted, enter the user name to be deleted.
For each pricing admin removed, the system responds with this line:

```
Removed pricing admin user_name
```
4. Repeat Step 3 until all appropriate user names are removed.

Removing Multiple Pricing Admins

To remove multiple pricing admins from the database:

1. Go to the *BRM_Home\setup\scripts* directory.
2. Create a text file (*text_file*) containing only the user names that you want to remove. Put each user name on a separate line, as in this example:

```
john_jones  
  
mary_allen
```
3. Run the **pricing_admin.pl** script with the **-remove** and *text_file* parameters:

```
perl pricing_admin.pl -remove < text_file
```

Starting Pricing Center

After installing the standalone version of Pricing Center, you can start it from the Windows start options.

See ["Starting Standalone Pricing Center"](#).

After installing Java Web Start and running Pricing Center for the first time, you can start Pricing Center in the following ways:

- Java Web Start.
See ["Starting Pricing Center from Java Web Start"](#).
- Browser.
See ["Starting Pricing Center from Your Browser"](#).

Use any of these methods to start the Web version. If a newer version of the Pricing Center files is available on the Web server, Java Web Start installs them on your system.

To start standalone Pricing Center, see ["Starting Standalone Pricing Center"](#).

Starting Standalone Pricing Center

To start the standalone version of Pricing Center:

1. From the start options, choose **Pricing Center**, which is under **Portal**.
2. Enter the root account password in the Login Application Center window.

Starting Pricing Center from Java Web Start

To start Pricing Center from the Java Web Start Application Manager:

Important: To start Pricing Center from Java Web Start, ensure that your Web browser is using the latest version of JRE 1.6 before starting Pricing Center from Java Web Start. You cannot start Pricing Center from Java Web Start in a Web browser using a version of JRE later than JRE 1.6.

1. Start Java Web Start from the start options.
2. If you do not see Pricing Center listed in the Application Manager, choose **View - Downloaded Applications**.
3. Select **Pricing Center** and click **Start**.

Starting Pricing Center from Your Browser

To start Pricing Center from your browser, go to the URL **`http://machine_name:port_number/PricingCenter_en.html`**.

This URL automatically starts Java Web Start, which in turn starts Pricing Center.

Uninstalling Pricing Center from a Client System

To remove a version of Pricing Center that has been downloaded to a client system:

1. Start Java Web Start from the start options.
2. If you do not see Pricing Center listed in the Application Manager, choose **View - Downloaded Applications**.
3. Select Pricing Center.
4. Choose **Application - Remove Application**.

Uninstalling Pricing Center from Windows

To remove a standalone version of Pricing Center from Windows:

1. From the Windows uninstall feature, select **Pricing Center 7.5**.
2. Click **Change/Remove**.
3. Click **OK**.

Installing Customer Center SDK on Windows

This section describes the requirements and the procedure for installing Customer Center SDK on Windows.

Customer Center SDK package includes components that are used to customize both Customer Center and Self-Care Manager. Follow these instructions for installing the common SDK package.

To customize Customer Center, see "Customizing the Customer Center Interface" in *BRM Developer's Guide*.

To customize Self-Care Manager, see "Customizing the Self-Care Manager Interface" in *BRM Developer's Guide*.

Important: Before installing Customer Center SDK, verify that JDK 1.6.0_26 is installed in your development environment. You must also have access to a BRM server.

For information about Customer Center SDK, see "Using Customer Center SDK" in *BRM Developer's Guide*.

Software Requirements

Customer Center SDK is available for the Windows operating system.

You must have the following software installed on or available to your system *before* you install Customer Center SDK:

- BRM.

See "[BRM Installation Overview](#)".

- A Web server such as Apache HTTP Server, IPlanet Web Server, or Microsoft Internet Information Server (IIS) with the Customer Center client software installed.

To install Customer Center, see "[Installing Customer Center on Windows](#)".

- An application such as WinZip for extracting compressed files.
- The JDK supported for this release.

See "[BRM Software Compatibility](#)".

- (Customer Center only) A Java Code Signing Certificate. Customer Center SDK includes a **makecertificate** utility for creating a self-signed certificate that you use to create **jar** files to deploy your customizations.
- (Optional) Borland JBuilder 5 or later, Professional or Enterprise Edition. You can use JBuilder for various tasks such as creating WAR files for Self-Care Manager and custom pages for Customer Center.

Information Requirements

Before installing Customer Center SDK, have the following information available:

- The destination folder for your Customer Center SDK installation.
- The name of the server where the CM is running.
- The port number where the CM is running.
- The database number for the Oracle DM.
- The URL for the Web server from which Customer Center is deployed. This is the directory where Customer Center is installed. For example, **http://server1**.

Installing Customer Center SDK

To install Customer Center SDK, verify that you have Administrator privileges, and then follow these steps:

1. Download the Customer Center SDK software.
2. Unzip the compressed Customer Center SDK files you downloaded.
3. Click **Setup.exe** to start the installation.

The installation program extracts files to a temporary directory on your computer.

4. Follow the instructions on the screen, providing the following information when prompted, or click **Next** to accept the default entries:
 - Destination folder for the installed software.
For Windows XP:
C:\Program Files\Portal Software\CustomerCenterSDK
For Windows 7 and 8.1:
C:\Program Files (x86)\Portal Software\CustomerCenterSDK
 - CM's server name, port, and database number.
 - Customer Center Web Start deployment URL, if available. Use the URL where you will deploy your customizations.
 - Program folder for the start options.
5. When the Setup Complete dialog box appears, click **Finish** to complete the installation.

Note: You can delete the temporary extraction directory created by the installation program if it is not automatically deleted when you exit your unzip application.

6. If you installed GSM Customer Center Extension on a Customer Center installation, copy the following files from the Customer Center library directory (*CC_path\lib*) to the library directory of the version of Customer Center included in Customer Center SDK (*CCSDK_path\lib*):

- **GSMManager.jar**
- **GSMManager_en.jar**
- **Modular.properties**

where:

- *CC_path* is the path to your Customer Center installation path.
- *CCSDK_path* is the CC SDK installation path.

GSM Customer Center Extension enables additional features, such as support for associating SIM and number devices with GSM services. See the information about working with GSM accounts in Customer Center Help.

Installing the Localization SDK on Windows

To extract the SDK files, you need a zip file utility, such as WinZip.

1. If you have installed an earlier version of the SDK, uninstall it.
2. Extract the files in the zip file to a temporary directory.
3. Install the files.
4. In a command window, use the **subst** command to substitute the drive letter for the build tree directory of the SDK. If you installed the SDK in the default location, enter the command as follows:

For Windows XP:

```
subst W: "C:\Program Files\Portal Software\Localization SDK"
```

For Windows 7 and 8.1:

```
subst W: "C:\Program Files(x86)\Portal Software\Localization SDK"
```

5. To prepare the MFC files, verify that the Visual C++ files are in the path:

```
C:\Program Files\Microsoft Visual Studio .NET 2003\vc7\bin\vcvars32.bat
```

The MFC files are ready to be translated. After translation, see "Building Payment Tool" in *BRM Developer's Guide*.

Installing Self-Care Manager on Windows

To use Self-Care Manager, you must install a third-party Web server, an application server, and Self-Care Manager itself. Perform the following procedures:

- [Installing an Application Server](#)
- [Installing the Self-Care Manager Files](#)

Important: You must install your application server and Self-Care Manager on the same system. The CM can be on the same system as Self-Care Manager or on a different system.

Installing an Application Server

Supported application servers include WebLogic and WebSphere. For more information, see the vendor installation instructions for the application server you are using.

Installing the Self-Care Manager Files

Before installing Self-Care Manager, make sure your application server servlet engine is installed. See "[Installing an Application Server](#)".

To install the Self-Care Manager files:

1. Follow the steps for "[Downloading the Compressed Files](#)".
2. See "[Installing the Software](#)" for information about the dialog boxes that appear when you install Self-Care Manager.

Note: When you configure your application server, it extracts the Self-Care Manager files to a location within your application server installation. The default location is **C:\Program Files\application_server\servers\default\WebKit. :**

3. Configure your application server to work with Self-Care Manager. For details, see "Configuring the Application Server" in *BRM Managing Customers*.

Problems Installing BRM Client Applications

This section describes problems you might encounter when installing BRM client applications and their solutions.

Problem: Cannot Start a Client Application after Installation

You cannot start one of the client applications, even though the installation appeared to be successful.

Possible Cause

BRM could not add the client application to your Windows path because the path is too long. Therefore, Windows cannot find it.

Solution

Review your path statement and delete references to obsolete programs. For more information, see your Windows documentation. Reboot the system before you try restarting the client application.

Installing Tax Calculation Managers

This chapter explains how to install the following Oracle Communications Billing and Revenue Management (BRM) tax calculation managers:

- Vertex Quantum Manager

Note: Vertex Quantum Manager does *not* support Vertex Communications Tax Q Series.

- Vertex Manager

Note: Vertex Manager supports Vertex Communications Tax Q Series and Vertex Sales Tax Q Series.

Before you read this document, you should be familiar with BRM concepts and architecture. See the following documents:

- "Introducing BRM" in *BRM Concepts*.
- "BRM System Architecture" in *BRM Concepts*.
- "About Calculating Taxes" in *BRM Calculating Taxes*.

Important:

- These tax calculation managers are optional features that require a separate license.
 - The third-party tax packages are not included with the BRM software; you must purchase and install those you want.
-

System Requirements

BRM tax calculation managers are available for the Linux, Solaris, and AIX operating systems. Vertex is also available for the HP-UX IA64 operating system.

Important: BRM tax calculation managers only run in 32-bit mode. Hence you should only use these with the 32-bit versions of the supported third-party tax packages.

For information on the Sales Tax Q Series (STQ) and Communications Tax Q Series (CTQ) versions supported by Vertex Data Manager (DM), see ["Other Compatible Software"](#).

For information on disk space requirements for the HP-UX IA64, Linux, Solaris, and AIX operating systems, see ["Disk Space Requirements"](#).

Software Requirements

Before installing a tax calculation manager:

- Third-Party software, which includes the PERL libraries and JRE required for installing BRM components.

See ["Installing the Third-Party Software"](#).

- You must install BRM.

See ["BRM Installation Overview"](#).

- Oracle 10g or Oracle 11g.

Installing Tax Calculation Managers

Note: If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

To install a tax calculation 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. For information see, ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).
-
-

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 the *temp_dir* directory, and run the **.bin** file.

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 the tax calculation manager is **opt/portal/7.5**.

Note: The installation program does not prompt you for the installation directory if BRM or a tax calculation 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 tax calculation manager package and source the **source.me** file:

Bash shell:

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

C shell:

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

6. Go 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 partition_utils.pl -o update
```

For more information, see "Updating Partitions" and "partition_utils" in *BRM System Administrator's Guide*.

Your BRM tax calculation manager installation is now complete.

Installing Tax Calculation Managers in a Multischema Environment

To install the tax calculation managers in a multischema environment:

1. Install the tax calculation manager on the primary installation machine.
See ["Installing Tax Calculation Managers"](#).
2. Configure the tax calculation manager on the primary installation machine.
See "Setting Up Tax Calculation for Vertex" in *BRM Calculating Taxes*.
3. Configure the secondary installation machine to link to the tax calculation software on the primary installation machine by adding the following lines to the secondary Connection Manager (CM) **pin.conf** file (*BRM_Home/sys/cm/pin.conf*):

```
- fm_rate vertex_db vertex_db_number /_tax_db 0- cm dm_pointer vertex_db_number  
ip hostname vertex_port_number
```

4. Configure the secondary installation machine to link to the **taxcodes_map** file on the primary installation machine by adding the following lines to the secondary CM **pin.conf** file (*BRM_Home/sys/cm/pin.conf*):

```
- fm_rate taxcodes_map path_to_taxcodes_map
```

What's Next?

If you installed Vertex Quantum Manager or Vertex Manager, see "Setting Up Tax Calculation for Vertex" in *BRM Calculating Taxes*.

Installing Paymentech Manager

This chapter explains how to install the Oracle Communications Billing and Revenue Management (BRM) Paymentech Manager software.

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

- "Introducing BRM" in *BRM Concepts*.
- "BRM System Architecture" in *BRM Concepts*.
- "About BRM-Initiated Payments" in *BRM Configuring and Collecting Payments*.

Important: Paymentech Manager is an optional feature that requires a separate license.

System Requirements

Paymentech Manager is available for the HP-UX IA64, Linux, Solaris, and AIX operating systems. For information on disk space requirements, see "[Disk Space Requirements](#)".

Software Requirements

Before installing Paymentech Manager, you must install the following:

- Third-Party software, which includes the PERL libraries and JRE required for installing BRM components.

See "[Installing the Third-Party Software](#)".

- BRM.

See "[BRM Installation Overview](#)".

Installing Paymentech Manager

Note: If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

To install Paymentech 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. For information see, ["Increasing Heap Size to Avoid “Out of Memory” Error Messages"](#).
-

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 the *temp_dir* directory and enter this command:

```
7.5.0_PaymentechMgr_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 Paymentech Manager is *BRM_Home/opt/portal/7.5*.

Note: The installation program does not prompt you for the installation directory if BRM or Paymentech 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 Paymentech Manager package and source the **source.me** file:

Bash shell:

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

C shell:

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

6. Go 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 partition_utils.pl -o update
```

For more information, see "Updating Partitions" and "partition_utils" in *BRM System Administrator's Guide*.

Your Paymentech Manager installation is now complete.

What's Next?

Read the instructions in "Configuring BRM-Initiated Payment Processing" in *BRM Configuring and Collecting Payments*.

Uninstalling Paymentech Manager

To uninstall Paymentech Manager, run the *BRM_Home/uninstaller/PaymentechMgr/uninstaller.bin*.

Installing Pipeline Configuration Center

This chapter explains how to install Oracle Communications Billing and Revenue Management (BRM) Pipeline Configuration Center (PCC).

PCC Installation Overview

This section provides an overview of the PCC installation process.

Overview of PCC Installation

PCC installation should be performed only by experienced system administrators. You must be familiar with the following before you begin the installation:

- UNIX operating system
- Oracle WebLogic Server administration
- Oracle Database administration

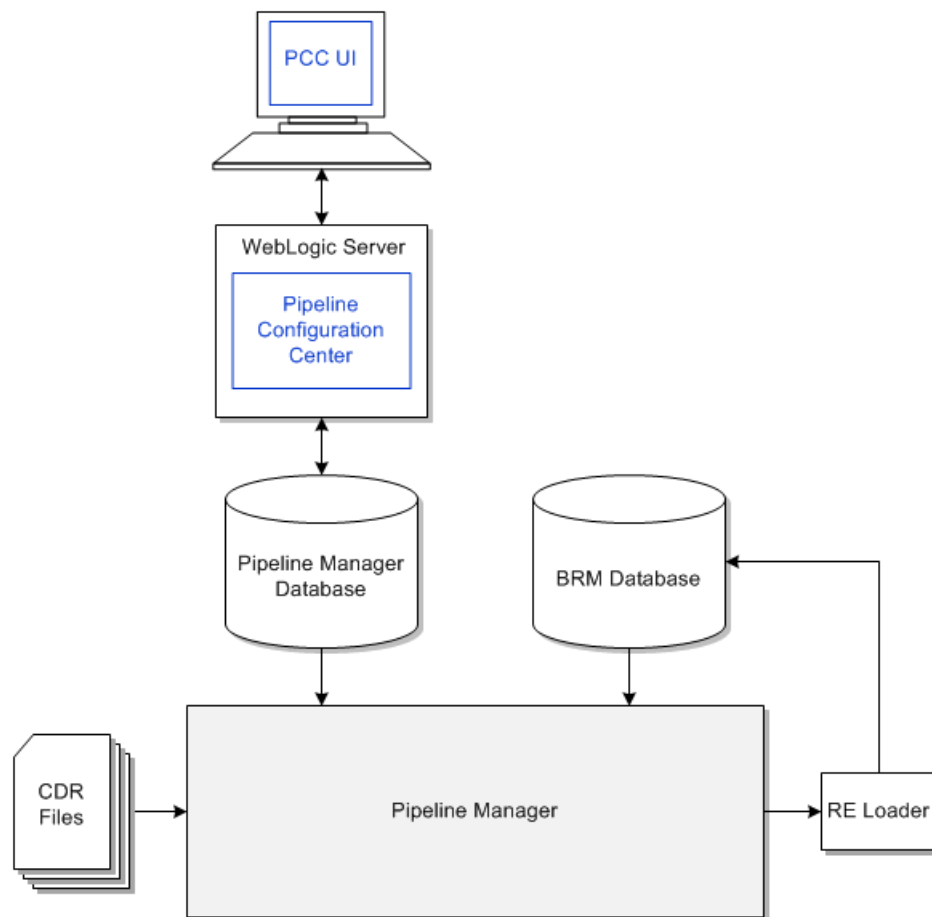
Additionally, you should have experience installing Java-related packages.

About the PCC Architecture

PCC is a Web-based BRM application that serves as the user interface for Pipeline Manager.

PCC runs on a managed server in an Oracle WebLogic Server domain. To interact with PCC, users enter the PCC login page URL in a browser and then enter their PCC user name and password in the login page. After a user is authenticated, the PCC home page appears in the browser.

[Figure 13-1](#) shows how PCC and Pipeline Manager are integrated.

Figure 13–1 PCC and Pipeline Manager Integrated Architecture

Operating System Security

PCC is supported on Linux (both Oracle Linux and Red Hat Enterprise Linux), Oracle Solaris for SPARC, Windows XP (browser only), Windows 7 (browser only), Windows 8.1 (browser only), and Windows 10 (browser only).

See the Linux, Solaris, and Oracle Database security documentation for more information.

Overview of the PCC Installation Procedure

The following is an overview of the PCC installation procedure:

1. Plan your installation. Planning an installation involves the following:
 - Determining the scale of your implementation (for example, is it a small test system or a large production system?).
 - Assessing how many physical computers you need and which software components to install on which computers.
2. Review system requirements.
3. Perform the following pre-installation tasks:
 - Install and configure Oracle WebLogic Server.
 - Set the JAVA_HOME environment variable.

- Install and configure BRM.
 - Configure Oracle Database advanced security encryption and integrity algorithms for a secure connection from the installer.
4. Install PCC.
 5. Perform the post-installation configuration tasks.
 6. Verify the installation.

Performing a Secure PCC Installation

This section describes recommended deployment configurations for your PCC installation that enhance security.

Recommended Installation Mode

You can install PCC in the following modes:

- GUI mode
- Silent mode

Oracle recommends that you install PCC using Secure Sockets Layer (SSL) in a production environment. See ["Installing PCC"](#) for more information.

The silent mode installation is not meant for production environments. It should be used only in test environments and only for setting up quickly or backing up the properties for later use in another test environment.

See ["Secure Deployment Checklist"](#) for information about the checklist to deploy PCC securely.

Ensuring a Successful PCC Installation

To ensure that the PCC installation is successful, follow these guidelines:

- As you install each component (for example, the WebLogic Server), verify that the component is installed successfully before continuing the installation process.
- Pay close attention to the system requirements.

Before you begin installing the application, ensure that your system has the required software. In addition, ensure that you know all the required configuration values, such as host names and port numbers.

- Make a note of any new configuration values as you create them.

You will be required to enter configuration values later.

PCC System Requirements

This section describes the software, hardware, server, and database requirements for installing PCC.

Software Requirements

PCC is deployed on an Oracle WebLogic Server domain. You must install and connect all required software for optimal performance. PCC is supported only on software and hardware listed in the following sections.

Supported Operating Systems

Table 13–1 lists operating systems that PCC supports.

Table 13–1 PCC Operating Systems Requirements

Product	Version
Oracle Linux, x86-64 (64bit)	<ul style="list-style-type: none"> ■ 5 UL3+ ■ 6 UL3+
Red Hat Enterprise Linux, x86-64 (64bit)	<ul style="list-style-type: none"> ■ 5 UL3+ ■ 6 UL3+
Oracle Solaris for SPARC (64bit)	10 Update 4+
Windows XP, x86 (32 bit) (browser only)	Professional with Service Pack 3
Windows 7, x86 (64 bit) (browser only)	Professional with Service Pack 1
Windows 8.1 (browser only)	Enterprise Support added in BRM 7.5 Patch Set 10.
Windows 10 (browser only)	Enterprise Support added in BRM 7.5 Patch Set 22.

Additional Software Requirements

Table 13–2 lists software required for running PCC.

Table 13–2 PCC Software Requirements

Product	Version	Disk Space
Oracle WebLogic Server Enterprise Edition	10.3.4 For BRM 7.5 Patch Set 11: 10.3.6 with Patch 12932224 For BRM 7.5 Patch Set 22: 12c R2 (12.2.0.2.0)	1 GB
Oracle Fusion Middleware Application Development Framework	11.1.1.4.0 with Patch 9941133 For BRM 7.5 Patch Set 11: 11.1.1.6.0 For BRM 7.5 Patch Set 22: 12c R2 (12.2.0.2.0)	1 GB
Oracle Database Server	The same version used by the BRM 7.5 installation to which PCC connects	1.2 GB
BRM on Linux x86-64 (64 bit) or Solaris SPARC (64 bit)	7.5 with Patch Set 2 (14334024) 7.5 with Patch Set 8 (18201600) or later	BRM server: 300 MB BRM database: 2 to 5 GB per 10,000 customers per year. This requirement varies greatly with the number of accounts and the amount of activity.

Table 13–2 (Cont.) PCC Software Requirements

Product	Version	Disk Space
Internet Browser	(Windows only) Microsoft Internet Explorer 8 on Windows XP and Windows 7 (Windows only) Microsoft Internet Explorer 11 on Windows 7 and Windows 8.1 (Compatibility View mode) Mozilla Firefox 32	NA
Java	For BRM 7.5 Patch Set 2: JDK 1.6.0_33 or above with minimum heap size of 500 MB For BRM 7.5 Patch Set 11: JDK 1.7 (64 bit) with the latest security update For BRM 7.5 Patch Set 22: JDK 1.8.0_45 (64 bit) with the latest security update For BRM 7.5 Patch Set 23: JDK 1.8.0_201 (64 bit) with the latest security update	NA

The PCC installer checks for all required software and displays errors if it detects any missing or unavailable components or if there are any connectivity-related issues.

Note: For information on how to download a required software component, see the relevant sections in the installation guide for that component.

Hardware Requirements

The number and configuration of the computers that you employ for your PCC installation depend on the scale and the kind of deployment you have planned.

[Table 13–3](#) provides the minimum hardware requirements for PCC installed on a single managed server in a domain.

Table 13–3 PCC Minimum Hardware Requirements

Component	Requirement
Hard disk	1.5 GB of free disk space. Note: A minimum of 1.5 GB should be free in the domain home.
Processor	Oracle recommends using twin cores, each running at 1.5 GHz CPU.
Memory	A minimum of 4 GB physical memory and 4 GB swap. If you plan to install the database on the same server as PCC, the minimum memory requirements increase to 6 GB physical memory and 6 GB swap.

Information Requirements

This section describes the information that you must provide during the PCC installation process. You define some of these configuration values when you install and configure Oracle WebLogic Server for PCC during the pre-installation tasks.

Note: Oracle recommends that you print the tables and record the values for future reference.

Oracle WebLogic Server Domain Information

[Table 13–4](#) lists the domain information required during PCC installation. This information pertains to the domain on which you want to deploy PCC.

Table 13–4 Oracle WebLogic Server Domain Information

Field	Description
Host Name	The IP address or the host name of the computer on which the PCC domain is configured.
Port Number	The port number assigned to the PCC domain administration server.
User Name	The PCC domain administrator user name.
Password	The password for the PCC domain administrator user.
WebLogic Home	The path of the directory where the Oracle WebLogic Server software is installed.
Use SSL?	(Optional) A check box to indicate whether the server on which you want to deploy PCC supports secure socket layer (SSL). Note: You must configure SSL when creating the domain on which you want to deploy PCC. See " Configuring SSL for the Oracle WebLogic Server Domain " for more information.
Keystore Location	(Optional) The path of the client-side keystore file generated from the exported public certificate using the keytool utility. Note: If you select the Use SSL? check box, you must select or enter the path of the keystore file.

BRM Pipeline Manager Database Connection Information

[Table 13–5](#) lists the Pipeline Manager database connection information required during PCC installation.

Table 13–5 Pipeline Manager Database Connection Information

Field	Description
Host Name	The IP address or the host name of the computer on which the Pipeline Manager database is configured.
Port Number	The port number assigned to the Pipeline Manager database service.
User Name	The user name of the Pipeline Manager database user.
Password	The password of the Pipeline Manager database user.
Service Name	The name of the Pipeline Manager database service.

BRM Connection Information

[Table 13–6](#) lists the BRM connection information required during PCC installation.

Table 13–6 BRM Connection Information

Field	Description
User Name	The user name for connecting to BRM.
Password	The BRM user's password.
Host Name	The IP address or the host name of the machine on which the primary BRM Connection Manager (CM) or CM Master Process (CMMP) are running.
Port Number	The TCP port number of the CM or CMMP on the host computer. The default value is 11960 .
Service Type	The BRM service type. The default value is /service/admin_client
Service POID Id	The POID of the BRM service. The default value is 1 .
Use SSL?	Whether to use SSL If you have not enabled SSL for BRM, deselect the Use SSL? check box. If you have enabled SSL for BRM, leave the Use SSL? check box selected.

PCC Pre-Installation Tasks

This section describes the tasks that you perform before installing PCC.

Overview of Pre-Installation Tasks

Pre-installation tasks for PCC are divided into the following groups:

- Install and configure Oracle WebLogic Server. See ["Installing and Configuring Oracle WebLogic Server"](#) for more information.
 - Enable SSL for the target Oracle WebLogic Server server domain, configure the server keystore certificate, and get the client keystore trusted certificate (.jks file).
 - If SSL is enabled, ensure that the keystore file is created in a secure drive and access is strictly limited to the user account.
- Set the JAVA_HOME environment variable. See ["Setting the JAVA_HOME Environment Variable"](#) for more information.
- Install and configure BRM. See ["Installing and Configuring BRM"](#) for more information.
- Configure Oracle Database advanced security encryption and integrity algorithms for a secure connection from the installer. See the Oracle Database documentation for advanced security configuration parameters. This is required for the PCC installer to make a secured (encrypted) database connection over the network.

Installing and Configuring Oracle WebLogic Server

This section describes procedures related to installing Oracle WebLogic Server and configuring the Oracle WebLogic Server domain on which you will deploy PCC.

Installing Oracle WebLogic Server

Oracle WebLogic Server is available as a component of the Oracle Fusion Middleware software. For more information on supported versions, see [Table 13–2, "PCC Software Requirements"](#).

Download Oracle WebLogic Server from the Oracle software delivery Web site:

<http://edelivery.oracle.com>

For information on installing Oracle WebLogic Server, see the Oracle WebLogic Server documentation.

Installing and Configuring Oracle Application Development Runtime

Oracle Application Development Runtime must be installed on the computer on which you install PCC. You can download Oracle Application Development Runtime from the Oracle software delivery Web site:

<http://edelivery.oracle.com>

For information on installing Oracle Application Development Runtime, see the Oracle Application Development Runtime documentation.

Note: The Oracle Fusion Middleware Application Developer installer installs both Oracle Application Development Runtime and Oracle Enterprise Manager.

See *Oracle Fusion Middleware Fusion Developer's Guide for Oracle Application Development Framework* for more information on Application Development Framework.

Creating an Oracle WebLogic Server Domain

To create a domain on which to deploy PCC, see the Oracle WebLogic Server documentation.

You must create the domain with at least one managed server and one administration server. Oracle recommends that you deploy PCC on a managed server in a production environment.

Table 13–7 shows the values to choose when creating the domain for PCC.

Table 13–7 Oracle WebLogic Server Domain Configuration Values

Configuration Value	Description
Domain Source	Select Generate a domain configured automatically to support the following BEA products. From the list, select Oracle JRF - 11.1.1.0 [oracle_common] .
Domain Mode Configuration	Select Production Mode.
Optional Configuration	Select Administration Server, Managed Servers, Clusters and Machines and Deployments and Services.
Administration Server Listen Address	Use a listen address that is equal to a resolvable DNS host or IP address. Do not use localhost or 127.0.0.1 .
Managed Server Listen Address	Enter a listen address that is equal to a resolvable DNS host or IP address.
Target Deployments to Clusters or Servers	Add all libraries to both the managed server target and the Administration Server.
Target Services to Clusters or Servers	Add all services to the managed server target.

See *Oracle Fusion Middleware Installation Guide for Oracle Enterprise Content Management Suite 11g Release 1* for more information on Oracle WebLogic Server domains.

You can now start the domain administration server manually and log in to WebLogic Server Administration Console.

Configuring SSL for the Oracle WebLogic Server Domain

To enable secure communication for PCC, you must configure secure socket layer (SSL) for the domain on which you want to deploy PCC.

To configure SSL for the domain:

1. Generate the server-side keystore file using the **keytool** utility.
See the *Key and Certificate Management Tool* online documentation for more information.
2. Export the public certificate from the server-side keystore file using the **keytool** utility.
See the *Key and Certificate Management Tool* online documentation for more information.
3. Generate the client-side keystore file from the exported public certificate using the **keytool** utility.
See the *Key and Certificate Management Tool* online documentation for more information.

Note: Note the path of the client-side keystore file. You must provide this path during the PCC installation if you choose to use SSL.

4. In WebLogic Server Administration Console, configure SSL for the domain managed server on which you want to deploy PCC.
See the Oracle WebLogic Server Administration Console Help for more information.

Setting the JAVA_HOME Environment Variable

You must set the JAVA_HOME environment variable to the latest compatible version of JRE/JDK on the machine on which you want to deploy PCC and for the WebLogic Server domain.

To set the JAVA_HOME environment variable on the machine on which you want to deploy PCC:

1. On the machine on which you want to deploy PCC, set the JAVA_HOME environment variable to the directory in which the latest compatible version of JRE/JDK is installed.
See [Table 13–2, "PCC Software Requirements"](#) for the supported JDK version.
2. Verify the Java version by running the following command:

```
$JAVA_HOME/bin/java -version
```

The Java version is displayed.

If the version displayed does not start with **1.7.0_** for Java 7 and **1.8.0_** for Java 8, the update was not successful.

To set the JAVA_HOME environment variable for the WebLogic Server domain:

1. On the machine on which Oracle WebLogic Server is installed, go to the *WebLogic_Home/user_projects/domains/Domain_Name/bin* directory.

where:

WebLogic_Home is the directory in which you installed the WebLogic Server.

Domain_Name is the domain directory in which PCC will be deployed.

2. Open the **setDomain.sh** file in a text editor.
3. Add or modify the following entries before the **EXTRA_JAVA_PROPERTIES** entry:

```
JAVA_HOME="${JAVA_HOME}"  
export JAVA_HOME
```

4. Save and close the file.
5. Restart Oracle WebLogic Server. See the Oracle WebLogic Server documentation for more information.
6. Verify the Java version used by Oracle WebLogic Server. The Java version is displayed when the WebLogic server is started.

If the version displayed does not start with **1.7.0_** for Java 7 and **1.8.0_** for Java 8, the update was not successful. See the Oracle WebLogic Server documentation for more information.

Installing and Configuring BRM

You must install BRM 7.5 with Patch Set 8 (18201600).

To install BRM:

1. Download BRM 7.5 from the Oracle software delivery Web site:
<http://edelivery.oracle.com>
2. Install BRM and Pipeline Manager.
See the BRM installation documentation.
3. Download BRM 7.5 Patch Set 8 (18201600) from the My Oracle Support Web site.
<http://support.oracle.com>
4. Install BRM 7.5 Patch Set 8 (18201600).
See *BRM 7.5 Patch Set Installation Guide*.

Setting Up the Business Parameter

If you use PCC with PDC, after installing BRM and the required patches, you must set up the **PriceDesignCenterInst** business parameter.

To set up **PriceDesignCenterInst**:

1. Go to *BRM_Home/sys/data/config* and run the following command, which creates an editable XML file from the pricing instance of the **/config/business_params** object.

```
pin_bus_params -r BusParamsPricing bus_params_pricing.xml
```


This directory includes the support files used by the **pin_bus_params** utility. To run it from a different directory, see *pin_bus_params* in the BRM documentation.

This command creates the XML file named **bus_params_pricing.xml.out** in your working directory. If you do not want this file in your working directory, specify the path as part of the file name.

2. Search for the following line in the XML file:

```
<PriceDesignCenterInst>disabled</PriceDesignCenterInst>
```

By default, **PriceDesignCenterInst** is set to **disabled**.

3. Change **disabled** to **enabled**.
4. Save the file as **bus_params_pricing.xml**.
5. Use the following command to load this updated file into the **/config/business_params** object:


```
pin_bus_params bus_params_pricing.xml
```
6. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

Obtaining the PCC Software

You can obtain and install the PCC 7.5 or PCC 7.5 patch set complete software.

Note: If you use PCC with PDC, you must install PCC 7.5 Patch Set 8 or later patch set releases.

Obtaining the PCC 7.5 Software

To obtain the PCC 7.5 software:

1. Create a temporary directory (*temp_dir*).
2. Go to the Oracle software delivery Web site:
<http://edelivery.oracle.com>
3. Sign in with your user name and password.
4. Search for Oracle Communications Pipeline Configuration Center and select the PCC 7.5 software pack from the search results.
5. From the Platform list, select the required platform.
6. Download the PCC software pack to *temp_dir*.
7. Unzip the PCC software pack and extract the contents to *temp_dir*.

Obtaining the PCC 7.5 Patch Set Software

To obtain the PCC 7.5 Patch Set software:

1. Create a temporary directory (*temp_dir*).
2. Go to the Oracle support Web site:
<https://support.oracle.com>
3. Sign in with your user name and password.

4. Click the **Patches & Updates** tab.
5. From the list, select **Patch Name or Number**.
6. In the text field, enter *PatchNumber* and click Search, where *PatchNumber* is patch number of Oracle Communications Billing and Revenue Management (BRM) 7.5 patch set that includes the PCC software.

See *BRM 7.5 Patch Set Installation Guide* for more information about the patch number.

The Patch Search Results page appears.
7. Click the patch name.

The patch details appear.
8. From the **Platform** list, select the platform and click **Download**.

The File Download dialog box appears.
9. Do one of the following:

If you are obtaining PCC 7.5 Patch Set 1 through PCC 7.5 Patch Set 21 software, do the following:
 - a. Download the appropriate **PipelineConfigurationCenter-7.5.0.x.0-platform.zip** software pack to *temp_dir*.

where:

x is the patch set version that you are installing. For example, for PCC 7.5 Patch Set 8, the version is 8.

platform is **linux** or **solaris**.
 - b. Unzip the **PipelineConfigurationCenter-7.5.0.0.0-platform.zip** file.

The following folder structure is created:

temp_dir/pcc/Disk1/install/
temp_dir/pcc/Disk1/stage/
If you are obtaining PCC 7.5 Patch Set 22 software, do the following:
 - a. Download the appropriate **pPatchNumber_7522_Generic.zip** software pack to *temp_dir*.
 - b. Unzip the **pPatchNumber_7522_Generic.zip** file.

The zip archive includes the **PipelineConfigurationCenter_7.5.0.22.0_generic.jar** installer.

Installing PCC

This section describes how to install PCC. Before installing PCC, read the following:

- [PCC Installation Overview](#)
- [PCC System Requirements](#)
- [PCC Pre-Installation Tasks](#)

You can install PCC in the following modes:

- **GUI mode:** Use the GUI mode when you want to interact with the PCC installer GUI during installation. See "[Installing PCC in GUI Mode](#)".

- **Silent mode:** Use the silent mode when you install PCC using the same configuration repeatedly. Silent install mode does not use the GUI, and it runs in the background. See "[Installing PCC in Silent Mode](#)".

The PCC installer must be launched from the computer hosting the Oracle WebLogic Server domain. PCC installation must be performed by the user who has permissions to write to the Oracle Inventory (**oraInventory**) directory and the *WebLogic_Home/user_projects/domains* directory, where *WebLogic_Home* is the directory in which you installed the WebLogic Server.

For more information about the **oraInventory** directory, see the Oracle documentation available at the Oracle Technology Network Web site:

<http://docs.oracle.com>

Installing PCC in GUI Mode

Note: To perform a GUI installation, install a GUI application, such as X Windows, and set the DISPLAY environment variable before you install PCC.

You can install PCC 7.5 or directly install the PCC 7.5 patch sets. To install PCC 7.5 or PCC 7.5 patch sets through PCC 7.5 Patch Set 21, follow the instructions in this section. To install PCC 7.5 Patch Set 22, see "[Installing PCC 7.5 Patch Set 22](#)".

To install PCC in GUI mode:

1. Ensure that the Pipeline Manager database server is running.
2. Start the Oracle WebLogic Server domain administration server and managed server on which you want to deploy PCC.
3. Obtain the PCC 7.5 or 7.5 patch set software. See "[Obtaining the PCC Software](#)".
4. Go to the *temp_dir/pcc/Disk1/install/* directory, and do one of the following:
 - To install the PCC software using the default **oraInventory** directory, run the following command:

```
./runInstaller.sh
```

- To install the PCC software using the **oraInventory** directory in a different location, enter the following command:

```
./runInstaller.sh -invPtrLoc FilePath/oraInst.loc
```

where *FilePath* is the path to the directory in which the **oraInst.loc** file is located.

- To record the response file contents during the GUI installation, run the following command:

```
./runInstaller.sh -record -destinationFile path
```

where *path* is the complete path and name of the response file.

The Welcome screen appears.

5. Click **Next**.

The Specify Inventory Directory and Credentials screen appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** (Linux) file or the **/var/opt/oracle/oraInst.loc** (Solaris) file.

This screen displays the path to the default inventory directory and the default operating system group name.

6. (Optional) To change the default inventory directory details, do the following:
 - a. Enter the full path of the inventory directory.
 - b. Specify the name of the operating system group that has write permission to the inventory directory.

The Specify Home Details screen appears.

7. Enter the following PCC installation details:
 - a. In the **Name** field, enter the PCC installation name.

Note: You can select the name for the installation from the list of names the installer provides.

- b. In the **Path** field, enter the path to the directory where you want to install PCC.

Note: Optionally, click **Browse** to navigate to the directory.

- c. Click **Next**.

The WebLogic Administration Server Connection screen appears.

8. Enter the following details for the domain on which you want to deploy PCC (see [Table 13–4, "Oracle WebLogic Server Domain Information"](#) for more information):
 - a. In the **Host Name** field, enter the IP address or the host name of the computer on which the domain is configured.
 - b. In the **Port Number** field, enter the port number assigned to the domain administration server.
 - c. In the **Username** field, enter the domain administrator user name.
 - d. In the **Password** field, enter the password for the domain administrator user.
 - e. In the **WebLogic Home** field, enter the path of the directory where the Oracle WebLogic Server software is installed.

WARNING: The PCC installer will not proceed until it verifies with the running instance of Oracle WebLogic Server that the domain administration server information you entered is valid.

- f. Do one of the following.

If the server does not support SSL, deselect the **Use SSL?** check box.

If the server supports SSL, leave the **Use SSL?** check box selected, and in the **Keystore Location** field, enter the path of the client side keystore file generated from the exported public certificate using the **keytool** utility. See

["Configuring SSL for the Oracle WebLogic Server Domain"](#) for more information.

- g. Click **Next**.

The WebLogic Server Selection screen appears.

9. Select the domain administration server or managed server on which you want to deploy PCC, and click **Next**.

Note: Oracle recommends deploying PCC on a managed server. If you select a managed server, ensure that the managed server and the node manager are running.

The BRM Pipeline Database Connection screen appears.

10. Enter the following information required to connect to the Pipeline Manager database (see [Table 13–5, "Pipeline Manager Database Connection Information"](#) for more information):
 - a. In the **Host Name** field, enter the IP address or the host name of the computer on which the Pipeline Manager database is configured.
 - b. In the **Port Number** field, enter the port number assigned to the Pipeline Manager database service.
 - c. In the **Username** field, enter the user name of the Pipeline Manager database user.
 - d. In the **Password** field, enter the password of the Pipeline Manager database user.
 - e. In the **Service Name** field, enter the name of the Pipeline Manager database service.

WARNING: The PCC installer will not proceed until it verifies with the running instance of the Pipeline Manager database server that the database information you entered is valid.

- f. Click **Next**.

The Pipeline Configuration Center User screen appears.

Note: Entering information in this screen is optional. If you do not want to create a PCC user now or if you have already created the PCC user, click **Next**.

11. (Optional) Enter the following information required to create a PCC user:
 - a. In the **Username** field, enter the name for the PCC user.
 - b. In the **Password** field, enter a password for the PCC user.

Note: The PCC user password can contain up to 12 characters and should contain at least one nonalphabetic character. For example, Weblogic123.

The user name must not be a part of the password.

- c. In the **Confirm Password** field, enter the password again.
- d. Click **Next**.

The Summary screen appears.

12. Review the selections you made in the preceding screens, and click **Install**.

The Install screen appears.

Note: After the installation begins, if you click **Stop installation**, the installation process stops, but the files that are already copied are not removed.

13. When the End of Installation screen appears, note the provided URL.

You use this URL to access PCC.

Note: If the server supports SSL, the secure connection is established for PCC even if you deselect the **Use SSL?** check box in the WebLogic Administration Server Connection screen. In this case, two connection URLs are displayed:

- A secured connection URL with SSL listen port and the HTTPS schema
 - An unsecured connection URL with the HTTP schema
-

14. Click **Exit**.

The Exit confirmation message appears.

15. Click **Yes**.

If you did not create a PCC user during installation, you must create one after the installation is complete. See "[PCC Post-Installation Tasks](#)".

See "[Verifying the PCC Installation](#)" for information on verifying the successful installation of PCC.

See "[About Installation Logs](#)" for information on PCC installer logs.

Installing PCC 7.5 Patch Set 22

To install PCC 7.5 Patch Set 22:

1. Ensure that the Pipeline Manager database server is running.
2. Start the Oracle WebLogic Server domain administration server and managed server on which you want to deploy PCC.
3. Obtain the PCC software. See "[Obtaining the PCC Software](#)".
4. Go to the *temp_dir* directory, and run one of the following commands:

- To start the GUI installer:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.X.0_generic.jar
```

where:

- *Java_home* is the directory in which you installed the latest supported Java version.
- *x* is the patch set version that you are installing. For example, for PCC 7.5 Patch Set 22, the version is 22.

- To start the GUI installer and install PCC in the **oraInventory** directory in a different location, enter the following command:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.X.0_generic.jar  
-invPtrLoc FilePath/oraInst.loc
```

where *FilePath* is the path to the directory in which the **oraInst.loc** file is located.

- To start the GUI installer and create a silent installer response file during the installation:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.X.0_generic.jar  
-record -destinationFile path
```

where *path* is the absolute path to the response file.

The Welcome screen appears.

5. Click **Next**.

The Specify Inventory Directory and Credentials screen appears if the **oraInst.loc** file is corrupt or not present. The default location of the **oraInventory** directory is in the **/etc/oraInst.loc** (Linux) file or the **/var/opt/oracle/oraInst.loc** (Solaris) file.

This screen displays the path to the default inventory directory and the default operating system group name.

6. (Optional) To change the default inventory directory details, do the following:

- Enter the full path of the inventory directory.
- Specify the name of the operating system group that has write permission to the inventory directory.

7. Click **Next**.

The Installation Location screen appears.

8. Enter the full path or browse to the directory in which you installed PCC.

The Feature Sets Selection screen appears.

9. Select **Pipeline Configuration Center**.

10. Click **Next**.

The WebLogic Server Details screen appears.

11. Enter the following details for the domain on which you want to deploy PCC (see [Table 13–4, "Oracle WebLogic Server Domain Information"](#) for more information):

- In the **Host Name** field, enter the IP address or the host name of the computer on which the domain is configured.

- b. In the **Port Number** field, enter the port number assigned to the domain administration server.
- c. In the **Username** field, enter the domain administrator user name.
- d. In the **Password** field, enter the password for the domain administrator user.
- e. In the **WebLogic Home** field, enter the path of the directory where the Oracle WebLogic Server software is installed.

WARNING: The PCC installer does not proceed until it verifies with the running instance of Oracle WebLogic Server that the domain administration server information you entered is valid.

- f. Do one of the following.

If the server does not support SSL, deselect the **Use SSL?** check box.

If the server supports SSL, leave the **Use SSL?** check box selected, and in the **Keystore Location** field, enter the path of the client side keystore file generated from the exported public certificate using the **keytool** utility. See ["Configuring SSL for the Oracle WebLogic Server Domain"](#) for more information.

- g. Click **Next**.

The WebLogic Server Selection screen appears.

- 12. Select the domain administration server or managed server on which you want to deploy PCC, and click **Next**.

Note: Oracle recommends deploying PCC on a managed server. If you select a managed server, ensure that the managed server and the node manager are running.

The Pipeline Manager Database Connection screen appears.

- 13. Enter the following information required to connect to the Pipeline Manager database (see [Table 13–5, "Pipeline Manager Database Connection Information"](#) for more information):
 - a. In the **Host Name** field, enter the IP address or the host name of the computer on which the Pipeline Manager database is configured.
 - b. In the **Port Number** field, enter the port number assigned to the Pipeline Manager database service.
 - c. In the **Username** field, enter the user name of the Pipeline Manager database user.
 - d. In the **Password** field, enter the password of the Pipeline Manager database user.
 - e. In the **Service Name** field, enter the name of the Pipeline Manager database service.

WARNING: The PCC installer will not proceed until it verifies with the running instance of the Pipeline Manager database server that the database information you entered is valid.

14. Click Next.

The BRM Connection Details screen appears.

15. Enter the following information required to connect the BRM server (see [Table 13–6, "BRM Connection Information"](#) for more information):

- a. In the **User Name** field, enter the user name for connecting to BRM.
- b. In the **Password** field, enter the BRM user's password.
- c. In the **Host Name** field, enter the IP address or the host name of the machine on which the primary BRM Connection Manager (CM) or CM Master Process (CMMP) are running.
- d. In the **Port Number** field, enter the TCP port number of the CM or CMMP on the host computer. The default value is **11960**.
- e. In the **Service Type** field, enter the BRM service type. The default value is **/service/admin_client**.
- f. In the **Service POID Id** field, enter the POID of the BRM service. The default value is **1**.
- g. Do one of the following:
 If you have not enabled SSL for BRM, deselect the **Use SSL?** check box.
 If you have enabled SSL for BRM, leave the **Use SSL?** check box selected.

16. Click Next.

The Pipeline Configuration Center User screen appears.

Note: Entering information in this screen is optional. If you have already created a PCC user, click **Next**.

17. Enter the following information required to create a PCC user:

- a. In the **Username** field, enter the name for the PCC user.
- b. In the **Password** field, enter a password for the PCC user.

Note: The PCC user password can contain up to 12 characters and should contain at least one nonalphanumeric character. For example, Weblogic123.

The user name must not be a part of the password.

- c. In the **Confirm Password** field, enter the password again.
- d. Click **Next**.

The Installation Summary screen appears.

18. Review the selections you made in the preceding screens, and click **Install.**

The Installation Progress screen appears.

Note: After the installation begins, if you click **Stop installation**, the installation process stops, but the files that are already copied are not removed.

19. When the Installation completes, Click Next.

The Installation Complete screen appears. Make note of the PCC URL. You use this URL to access PCC.

Note: If the server supports SSL, the secure connection is established for PCC even if you deselect the **Use SSL?** check box in the WebLogic Administration Server Connection screen. In this case, two connection URLs are displayed:

- A secured connection URL with SSL listen port and the HTTPS schema
 - An unsecured connection URL with the HTTP schema
-

20. Click Finish.

The PCC installer exits.

Installing PCC in Silent Mode

Silent-mode installation enables you to set installation configurations only once and then use those configurations to duplicate the installation on many machines.

Note: The silent installation is not meant for production environments, and it should be used in test environments only for setting up quickly or backing up the properties for later use in another test environment.

Creating a Response File

To create a response file:

1. Create the response file by doing one of the following:
 - Create a copy of the response file that was generated during the GUI installation. See ["Installing PCC in GUI Mode"](#) for more information.

Note: The GUI Installer does not store passwords provided during installation in the response file. You must manually add the passwords after creating a copy of the response file.

- If you are installing PCC 7.5 Patch Set 22, create a response file using the template by running the following command:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.22.0_generic.jar  
-getResponseFileTemplates
```

where *Java_home* is the directory in which you installed the latest supported Java version.

A response file is created with the default values.

You can create as many response files as needed.

2. Open the file in a text editor.

3. Modify the response file you copied by specifying the key-value information for the parameters you want in your installation.

Notes:

- The response file template contains guidelines and examples on how to enter the values in the parameters.
 - The PCC installer treats incorrect context, format, and type values in a response file as if no value were specified.
-

4. Save and close the response file.

Installing PCC in Silent Mode

To install PCC in silent mode:

1. Create a response file. See ["Creating a Response File"](#).
2. Go to the `temp_dir/pcc/Disk1/install/` directory, where `temp_dir` is the directory in which you unzipped the PCC software, and enter the following UNIX command:

```
./runInstaller -responseFile path -silent
```

where `path` is the response file name and location.

For example:

```
./runInstaller -responseFile /response_files/myresponsefile.rsp -silent
```

The installation runs silently in the background.

3. Open the `PCC_Home/install/readme.txt` file, where `PCC_Home` is the directory in which you installed PCC.
4. Copy the URL and paste it in your browser's address field.

You can now access the PCC application.

See ["Verifying the PCC Installation"](#) for information on how to verify that the PCC installation was successful.

See ["About Installation Logs"](#) for information on the PCC installer logs.

Installing PCC 7.5 Patch Set 22 in Silent Mode

To install PCC 7.5 Patch Set 22 in silent mode:

1. Create a response file. See ["Creating a Response File"](#).
2. Copy the response file you created to the machine on which you run the silent installation.
3. On the machine on which you run the silent installation, go to the `temp_dir` directory, and run the following command:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.22.0_generic.jar
-debug -invPtrLoc Inventory_home/oraInventory/oraInst.loc [parameter=value]
-responseFile path -silent
```

where:

- `path` is the absolute path to the response file.
- `parameter` is the name of an installation parameter.

- *value* is the value of the installation parameter.

For example:

```
Java_home/bin/java -jar PipelineConfigurationCenter_7.5.0.22.0_generic.jar  
-debug -invPtrLoc Inventory_home/oraInventory/oraInst.loc INSTALL_TYPE=Complete  
-responseFile /response_files/myresponsefile.rsp -silent
```

The installation runs silently in the background.

4. Open the *PCC_Home/install/readme.txt* file, where *PCC_Home* is the directory in which you installed PCC.
5. Copy the URL and paste it in your browser's address field.

You can now access the PCC application.

See "[Verifying the PCC Installation](#)" for information on how to verify that the PCC installation was successful.

See "[About Installation Logs](#)" for information on the PCC installer logs.

About Installation Logs

The PCC Installer logs can be found in the **oraInventory/logs** directory.

Use the following log files to monitor installations and post-installations:

- **installActionTimeStamp.log**
- **oraInstallTimeStamp.err**
- **oraInstallTimeStamp.out**
- **silentInstallTimeStamp.log** (for silent mode installation)

where *TimeStamp* is the date and time the log file was created.

PCC Post-Installation Tasks

This section provides instructions for the following PCC post-installation tasks:

- [Creating a PCC User after Installing PCC](#)
- [Configuring a Connection from PCC to BRM](#)
- [Using Secure Cookies](#)
- [Configuring the Session Timeout](#)

Creating a PCC User after Installing PCC

During the PCC installation, the installer creates the **Config Admin** Oracle WebLogic Server group. Users belonging to this group have read and write access to perform all the tasks in PCC.

You can create a PCC user during or after the installation. When you create a user during the installation, the installer automatically adds it to the **Config Admin** group.

To create a PCC user after installing PCC, use WebLogic Server Administration Console to create a user and to add the user to the **Config Admin** group.

Note: Do not use your browser's remember password feature for the WebLogic Server Administration Console URL. As a precaution, always enter the WebLogic server user name and password manually.

To create a PCC user after installing PCC:

1. Log in to WebLogic Server Administration Console.
2. In the **Domain Structure** panel, click the **Security Realms** link.
The **Summary of Security Realms** page appears.
3. Click the **myrealm** link.
The **Settings for myrealm** page appears.
4. Click the **Users and Groups** tab.
5. Click the **Users** subtab.
6. Click **New**.
The **Create a New User** page appears.
7. Do the following:
 - a. In the **Name** field, enter a name for the PCC user.
 - b. (Optional) In the **Description** field, enter a brief description for the PCC user.
 - c. In the **Password** field, enter a password for the PCC user.

Note: The PCC user password can contain up to 12 characters and should contain at least one nonalphanumeric character. For example, Weblogic123.

The user name must not be a part of the password.

- d. In the **Confirm Password** field, enter the password again to confirm it.
8. Click **OK**.
The user name appears in the User table.
9. Click the *user* link, where *user* is the PCC user that you created.
The **Settings for user** page appears.
10. Click the **Groups** tab.
11. In the **Parent Groups** section's **Available** list, select **Config Admin**.
12. Move **Config Admin** to the **Chosen** list.
13. Click **Save**.

Configuring a Connection from PCC to BRM

After the PCC installation is complete, configure a connection from PCC to BRM.

To configure a connection from PCC to BRM:

1. Open the `PCC_Home/plan/AppFileOverrides/PCCView.war/Infranet.properties` file, where *PCC_Home* is the directory in which you installed PCC.

Note: As a backup, a copy of the **Infranet.properties** file might also be in the location specified in the HOME environment variable of the operating system user who starts WebLogic Server. In this situation, you must configure the connection in both instances of the file.

2. Search for the **infranet.connection** entry.
3. Edit the **infranet.connection** entry as follows:

```
infranet.connection=pcp://username:password@hostname:port/service 1
```

where:

- *username* is the login name to use for connecting to BRM. You can use any valid CSR login name.
 - *password* is the password for *username*.
 - *hostname* is the name or IP address of the computer running the primary Connection Manager (CM) or CM Master Process (CMMP).
 - *port* is the TCP port number of the CM or CMMP on the host computer. The port number must match the corresponding **cm_ports** entry in the primary CM or CMMP configuration file.
 - *service* is the service type. The trailing **1** is the POID of the service.
4. Save and close the file.
 5. Log in to WebLogic Server Administration Console for the PCC domain, and do the following:
 - a. In the **Domain Structure** panel, click **Deployments**.
The **Summary of Deployments** page appears.
 - b. In the Deployments table, select the **PipelineConfigurationCenter** check box.
 - c. Click **Update**.
The Update Application Assistant starts.
 - d. Select the **Update this application in place with new deployment plan changes** option.
 - e. Set **Deployment plan path** to the location of the **Infranet.properties** file. Use the **Change Path** button to browse to the file.
 - f. Click **Next**, and review your choices.
 - g. Click **Finish**.
 - h. Restart WebLogic Server.See the Oracle WebLogic Server Administration Console Help for more information about the console.
 6. Secure the BRM connection information as follows:
 - Encrypt the password by using the **pin_crypt_app** utility. See the BRM documentation for more information about the utility.
 - Set the **Infranet.properties** file permissions to permit only specified system administrators to access the file.

Using Secure Cookies

Oracle recommends deploying PCC only on SSL, which encrypts sensitive data, thus eliminating problems like session stealing.

WebLogic Server enables a user to securely access HTTPS resources in a session that was initiated using HTTP, without loss of session data.

To use secure cookies:

1. Open the *WebLogic_Home/user_projects/domains/Domain_Name/config/config.xml* file.

where:

- *WebLogic_Home* is the directory in which you installed WebLogic Server.
- *Domain_Name* is the name of the domain you are configuring.

2. Add **AuthCookieEnabled="true"** to the **<WebServer>** element:

```
<WebServer Name="myserver" AuthCookieEnabled="true" />.
```

Note: By default, **AuthCookieEnabled** is set to **true**. The secured cookies are enabled by default even if the **config.xml** file does not contain this entry. You can set **AuthCookieEnabled** to **false** to disable secured cookies. However, Oracle recommends not disabling it.

You can also set this entry by using WebLogic Server Administration Console:

1. Log in to WebLogic Server Administration Console.
The home page appears.
2. In the **Domain Configurations** section, under **Domain**, click **Domain**.
The **Settings for Domain_Name** page appears.
3. Click the **Web Applications** tab.
4. Verify that the **Auth Cookie Enabled** check box is selected.
5. Click **Save**.

By default, the **Auth Cookie Enabled** check box is selected, but it is not present in the **config.xml** file. If you deselect it, the **<AuthCookieEnabled>** element is added to the **config.xml** file.

Setting **AuthCookieEnabled** to **true**, the default setting, causes the WebLogic Server instance to send a new secure cookie, **_WL_AUTHCOOKIE_JSESSIONID**, to the browser when authenticating through an HTTPS connection. After the secure cookie is set, the session is allowed to access other security-constrained HTTPS resources only if the cookie is sent from the browser.

For more information, see the "Using Secure Cookies to Prevent Session Stealing" article on the Oracle Technology Network Web site:

http://download.oracle.com/docs/cd/E12840_01/wls/docs103/security/thin_client.html#wp1053780

Oracle recommends keeping cookie settings enabled in the browser. Disabling cookies in the browser disables several features, such as Help.

Configuring the Session Timeout

The default session timeout in PCC is 600 seconds. The WebLogic Server administrator can change this value as follows:

1. Log in to WebLogic Server Administration Console.
2. In the **Domain Structure** panel, click **Deployments**.
The **Summary of Deployments** page appears.
3. In the Deployments table, click **PipelineConfigurationCenter**.
The **Settings for PipelineConfigurationCenter** page appears.
4. Click the **Configuration** tab.
5. In the **Session Timeout (in seconds)** field, enter a new timeout value in seconds.
6. Click the **Overview** tab.
7. In the Modules and Components table, click **PCC-PCCViewController-context-root**.
8. Click the **Configuration** tab.
9. In the **Session Timeout (in seconds)** field, enter the same timeout value, in seconds, that you entered in step 5.
10. Click **Save**.

If no deployment plan is created, WebLogic Server creates one with the preceding changes and prompts you to save the deployment plan. Provide the name and path for the deployment plan, and click **OK**.

11. In the **Domain Structure** panel, click **Deployments**.
12. Select the **PipelineConfigurationCenter** check box.
13. Click **Update**.
The Update Application Assistant starts.
14. Select the **Update this application in place with new deployment plan changes** option.
15. Set **Deployment plan path** to the deployment plan created in step 10. Use the **Change Path** button to browse to the file.
16. Click **Next**.
17. Click **Finish**.
18. Restart WebLogic Server.

19. Verify your changes by doing the following:
 - a. Log in to WebLogic Server Administration Console.
 - b. In the **Domain Structure** panel, click **Deployments**.
 - c. Click **PipelineConfigurationCenter**.
The **Settings for PipelineConfigurationCenter** page appears.
 - d. Click the **Configuration** tab.
 - e. Verify that **Session Timeout (in seconds)** is set to the value you specified.

For more information, see the "Configuring Applications for Production Deployment" article on the Oracle Technology Network Web site:

http://download.oracle.com/docs/cd/E12840_01/wls/docs103/deployment/config.html

Verifying the PCC Installation

This section describes how to verify that PCC is installed correctly.

Checking the State of All Installed Components

You can verify that PCC is installed correctly by checking the state of all installed components.

To check the state of all installed components:

1. Log in to the PCC domain in WebLogic Server Administration Console.
2. In the **Domain Structure** panel, click **Deployments**.
The **Summary of Deployments** page appears.
3. In the **Control** tab, if PCC is installed correctly, the deployed **PipelineConfigurationCenter** application appears in the **Active** state.

Logging In to PCC

You can log in to PCC to verify that PCC is installed.

To log in to PCC:

1. Open a browser window.
2. Enter the URL provided by the PCC installer at the end of the installation into the browser's address field.

Note: The URL to access PCC is also available in the *PCC_Home/install/readme.txt* file, where *PCC_Home* is the directory in which you installed PCC.

3. Press Enter.

The PCC login page appears.

4. Do the following:
 - a. In the **Username** field, enter the user name.
 - b. In the **Password** field, enter the password.
5. Click **Login**.

The PCC home page appears, verifying that PCC is successfully installed.

About File Permissions

- The following default permissions are set for the installed files:
 - rw----- 600 (for all nonexecutable files)
 - rwx----- 700 (for all executable files)

Permissions are set to the lowest possible level, and the WebLogic Server administrator can add or revoke permissions. Oracle recommends keeping the permissions as restrictive as possible.

- Protect the WebLogic configuration (JMS, JDBC, and so on) file, **config.xml**, in the domain's **config** directory with proper permissions.

Securing the Infranet.properties File

During the PCC installation, the installer creates the *PCC_Home/plan/AppFileOverrides/PCCView.war/Infranet.properties* file.

Note: As a backup, a copy of the **Infranet.properties** file might also be in the location specified in the HOME environment variable of the operating system user who starts WebLogic Server. In this situation, you must secure both instances of the file.

An **Infranet.properties** file is a configuration file that contains entries to control connections from Java applications to BRM. For more information about such files, see the BRM documentation set.

After the installation is complete, you add the BRM user name and password for connecting PCC to BRM to the PCC **Infranet.properties** file. See *BRM PCC Installation and System Administration Guide* for more information.

To secure this connection information, do the following:

- Encrypt the password by using the **pin_crypt_app** utility. See the *BRM Developer's Guide* for more information about the utility.
- Set the **Infranet.properties** file permissions to permit only specified system administrators to access the file.

Uninstalling PCC

You use the PCC installer to uninstall PCC. To uninstall PCC 7.5 or 7.5 patch sets through PCC 7.5 Patch Set 21, follow the instructions in this section. To uninstall PCC 7.5 Patch Set 22, see "[Uninstalling PCC 7.5 Patch Set 22](#)".

Note: To enable a graphical user interface (GUI) uninstallation, install a GUI application such as X Windows and set the DISPLAY environment variable to point to the GUI application server before you uninstall PCC.

To uninstall PCC:

1. Go to the *temp_dir/pcc/Disk1/install* directory, where *temp_dir* is the directory in which you unzipped the PCC software.
2. Enter the following UNIX command:

```
./runInstaller
```

The Welcome screen appears.

3. Click **Deinstall Products**.

The Inventory screen appears.

4. Select the PCC installation name that you entered during PCC installation.
5. Click **Remove**.
The Confirmation screen appears.
6. Click **Yes**.
The User Input screen appears.
7. In the **WebLogic Administrator password** field, enter the PCC domain administrator password.

See [Table 13–4, "Oracle WebLogic Server Domain Information"](#) for more information.

Important: Even if you enter an incorrect WebLogic Administrator password, the uninstallation is completed; however, it is not a clean uninstallation. In this case, you must perform manual cleanup tasks after uninstalling PCC. See *Pipeline Configuration Center Release Notes*.

8. Click **OK**.

Important: After the uninstallation begins, even if you click **Cancel**, PCC is uninstalled. Oracle recommends not clicking **Cancel** in the middle of the uninstallation to prevent the PCC installer screen from hanging.

The PCC components are uninstalled.

The Inventory screen appears.

9. Click **Close**.
The Welcome screen appears.
10. Click **Cancel**.
The Exit dialog box appears.
11. Click **Yes**.

The PCC installer removes all files except log files. You must delete the log files manually. The log files are in the **oraInventory/logs** directory.

Uninstalling PCC in Silent Mode

To uninstall PCC in silent mode:

1. Go to the `temp_dir/pcc/Disk1/install` directory, where `temp_dir` is the directory in which you unzipped the PCC software.
2. Run the following command:

```
./runInstaller -responseFile path -silent -deinstall
```

where `path` is the response file name and location.

A message indicating that PCC has been uninstalled successfully appears.

Uninstalling PCC 7.5 Patch Set 22

Note: After uninstalling PCC, you must manually undeploy the PCC application deployed on the WebLogic server domain. See the discussion about undeploying applications in the Oracle WebLogic Server documentation.

To uninstall PCC 7.5 Patch Set 22:

1. Go to the *PCC_home/oui/bin* directory.
2. Run the following command from a GUI (for example, VNC server):

```
./deinstall.sh
```

The Distribution to Uninstall screen appears.

3. Select the components you want to uninstall.
4. Click **Uninstall**.

The Welcome screen appears.

5. Click **Next**.

The Uninstallation Summary screen appears.

6. Click **Uninstall**.

The Uninstallation Progress screen appears.

7. Click **Next**.

The Uninstallation Complete screen appears.

8. Click **Finish**.

The PCC installer removes all files except log files. You must delete the log files manually. The log files are in the **oraInventory/logs** directory.

Uninstalling PCC 7.5 Patch Set 22 in Silent Mode

To uninstall PCC 7.5 Patch Set 22 in silent mode:

1. Go to the *PCC_home/oui/bin* directory.
2. Run the following command:

```
./deinstall.sh -responseFile path -silent
```

where *path* is the absolute path to the response file.

A message indicating that PCC has been uninstalled successfully appears.

Deleting Files after Uninstalling PCC

The following files remain in the system after PCC is uninstalled:

- Install logs
The log files are in the **oraInventory/logs** directory.
- *PCC_Home/oui/data.properties*
This file is used to auto-populate the data during reinstalls.

Delete these files manually if you do not need them, or protect them appropriately if they are required for further installations.

By default, these files are created with the file-level permission 640 (owner can read/write; group members can read; others cannot do anything).

Administering PCC

This section provides an overview of basic administration tasks for PCC.

PCC Administrator Tasks

A PCC administrator is responsible for the day-to-day tasks of maintaining and managing PCC and its users. You perform the following tasks as a PCC administrator:

- [Managing PCC Security](#)
- [Monitoring PCC](#)
- [Managing PCC](#)

Managing PCC Security

Oracle WebLogic Server includes a security architecture that provides a secure foundation for applications. PCC depends on the WebLogic Server security framework to secure its resources and servers. Managing PCC security involves the following:

- Managing security realms: Configuring new security realms, changing the default security realm, and deleting security realms
- Managing users and groups: Defining users and assigning them to a group that can be authenticated in a security realm
- Managing security providers: Managing security providers that provide security services to applications to protect WebLogic Server resources

See the Oracle WebLogic Server Administration Console Help for more information on managing security realms, managing users and groups, and managing security providers.

Monitoring PCC

Regularly monitoring your system ensures fast recognition and resolution of problems or issues. You can use WebLogic Server Administration Console to monitor the following:

- PCC domain
- PCC administration server and managed servers

See the Oracle WebLogic Server Administration Console Help for more information.

Managing PCC

You manage PCC by managing the WebLogic server on which PCC is installed. This includes starting and stopping the PCC administration server and managed servers.

See the Oracle WebLogic Server Administration Console Help for more information.

Troubleshooting PCC

This section provides guidelines for troubleshooting problems with PCC. It includes information about log files, diagnosing common problems, and contacting Oracle support.

Troubleshooting Checklist

When problems occur, it is best to do some troubleshooting before you contact Oracle support:

- You know your installation better than Oracle support does. You know whether anything in the system has been changed, so you are more likely to know where to look first.
- Troubleshooting skills are important. Relying on Oracle support to research and solve all your problems prevents you from being in full control of your system.

If you have a problem with your PCC system, ask yourself the following questions because Oracle support will ask them:

- What exactly is the problem? Can you isolate it?
Oracle support needs a clear and concise description of the problem, including when it began to occur.
- What do the log files say?
This is the first thing that Oracle support asks for. Check the error log for the PCC component you are having problems with.
- Has anything changed in the system? Did you install any new hardware or new software? Did the network change in any way? Does the problem resemble another one you had previously? Has your system usage recently jumped significantly?
- Is the system otherwise operating normally? Has response time or the level of system resources changed? Are users complaining about additional or different problems?

Using Error Logs to Troubleshoot PCC

PCC error log files provide detailed information about system problems. If you are having a problem with PCC, look in the log files.

PCC records information about actions performed in the PCC GUI in Oracle WebLogic Server log files. See the Oracle WebLogic Server Administration Console Help for more information.

Diagnosing PCC Problems

PCC problems can be diagnosed using the Oracle WebLogic Server Diagnostic Framework, which enables you to collect, archive, and access diagnostic information about applications hosted on the WebLogic server. See the Oracle WebLogic Server Administration Console Help for more information.

This section lists some common PCC problems and describes how to diagnose the error messages and resolve the problems.

Refreshing the Browser

Do not refresh your browser.

Refreshing the browser causes unpredictable problems in PCC.

Unable to Perform Any Task after Logging In

After you log in to PCC, the links in the navigation pane are not displayed, and you cannot perform any task.

This means that you are not in the **Config Admin** WebLogic Server group. Contact your system administrator, and request to be added to that group.

Getting Help for PCC Problems

If you cannot resolve a PCC problem, contact Oracle support.

Before you contact Oracle support, try to resolve the problem with the information in the log files. See ["Using Error Logs to Troubleshoot PCC"](#) for more information. If this does not help resolve the problem, gather the following information:

- A clear and concise description of the problem, including when it began to occur.
- Relevant portions of the relevant log files.
- Relevant configuration files.
- Recent changes in your system after which the problem occurred, even if you do not think they are relevant.
- A list of all PCC components and patches installed on your system.

When you are ready, report the problem to Oracle support.

Using Localized PCC

Localized versions of BRM client applications are available in the following languages:

- Chinese Simplified
- Chinese Traditional
- French
- Italian
- Japanese
- Korean
- Portuguese Brazilian
- Russian
- Spanish

Note: Only the PCC application GUI is localized. The language-based text strings displayed in the GUI are based on the web browser locale.

Secure Deployment Checklist

To deploy PCC securely, follow this checklist:

1. Pre-installation steps:
 - a. Enable SSL for the target Oracle WebLogic Server domain.

- b.** Configure the server keystore certificate, and get the client keystore trusted certificate.
 - c.** Configure Oracle Database advanced security encryption and integrity algorithms for a secure connection from the installer.
 - d.** Verify that you have the latest compatible version of JDK with the latest security update installed and configured with your PCC/WebLogic Server installation.
- 2.** Installation steps:
 - a.** Select SSL mode, and provide the client keystore certificate (.jks file) for connecting to a WebLogic server over SSL.
- 3.** Post-installation steps:
 - a.** If you do not need the installation log files, delete them.
 - b.** The WebLogic Server administrator must create PCC users based on the roles and privileges.
 - c.** Do not use your browser's remember password feature for the WebLogic Server Administration Console URL.
 - d.** Enable secure cookies.
 - e.** Verify that file permissions for the installed files are 600 for all nonexecutable files and 700 for all executable files.
- 4.** Un-installation steps:
 - a.** Delete the log files in the **oraInventory/logs** directory manually if you do not need them, or protect them appropriately if they are required for further installations.

Troubleshooting the BRM Installation

Although the Oracle Communications Billing and Revenue Management (BRM) system is designed for trouble-free installation, you might encounter a problem. This chapter lists some problems other customers have encountered and describes their solutions.

For more information, see "Reference Guide to BRM Error Codes" and "Resolving Problems in Your BRM System" in *BRM System Administrator's Guide*.

Problems Installing the Database

For more information on errors that can occur when installing your database, see your database documentation.

Problem: Cannot Start the Oracle Listener

When you try to start the Oracle Listener, you get a "permission denied" error.

Possible Cause

The path points to a directory for which you do not have access.

Solution

Change the permissions to the directory where the **listener.ora** and **listener.log** files are stored.

Problem: Cannot Connect to the Oracle Database as the System User

You cannot connect to the database as the **system** user with SQL.

Possible Causes

- The Oracle Listener is not running.
- Oracle cannot find a **tnsnames.ora** file.
- The **tnsnames.ora** file does not point to a valid database.

Solution

1. Start the Oracle Listener.
2. Make sure the **tnsnames.ora** file points to your database on the specific host machine.

3. Make sure the Oracle user's path contains the correct path to your **tnsnames.ora** file.

Problems Installing BRM

If you have a problem installing the BRM software or its optional components, first check the **pin_setup.log** file, and then the Data Manager (DM) and Connection Manager (CM) **log** files for possible reasons for the failure.

Problem: The Setup Script Cannot Start the CM or DM on HP-UX IA64

The **pin_setup** script fails when it tries to start the Connection Manager (CM) or Data Manager (DM).

Possible Cause

The manager cannot find the **dld.so** (HP-UX IA64) file, because the CM or DM host computer is missing the necessary C++ libraries.

Solution

Install C++ runtime libraries on the computer that will run the System Manager, and reinstall BRM. See "[Overview of Hardware and Software Requirements](#)".

Problem: HP-UX IA64 Semaphore Errors

BRM installation fails, and you receive the following error:

```
ORA-07279: spcre: semget error, unable to get first semaphore set.  
HP-UX Error: 28: No space left on device  
Additional information: 1
```

Possible Cause

The database host server doesn't have sufficient shared memory to perform the installation.

Solution

Set the kernel **SEMMNI**, **SEMMNS**, and **SEMMAP** parameters to the following values:

```
SEMMNI = 1000  
SEMMNS = 1000  
SEMMAP = 1002
```

Note: If multiple applications are running on the host computer, increase the values in these parameters to handle the most demanding application's semaphore requirements.

Problem: An Error Occurred during the Move Data Process

You receive the error "An error occurred during the move data process -132."

Possible Cause

A BRM process is running, so the **pin_setup** script cannot finish executing.

Solution

Make sure you stop all existing BRM processes, and then run the **pin_setup** script again.

Problem: Errors Are Recorded in the Log File When dm_oracle Starts

After you install BRM and while running the **pin_setup** script of BRM, when the Oracle DM starts, errors are recorded in the **dm_oracle.pinlog** file.

Possible Cause

Cannot find the ACCOUNT_T table, as this gets created later on.

Solution

There is no solution; the error does not impact any functionality and can be ignored.

Problem: An Error Occurs in the dm_fusa.pinlog file during pin_setup of Paymentech Manager

Errors occur while running the **pin_setup** script of Paymentech Manager in the **dm_fusa.pinlog** file.

Possible Cause

The simulator is not started.

Solution

After the **pin_setup** of Paymentech Manager is complete, start the answer simulator to remove the errors. The simulators are in *BRM_Home/bin*. You start the simulator through the command line:

```
start_answer
```

Problems Connecting to the Database

Conflicting settings in the **pin_setup.values** configuration file often cause database connection failures.

Problem: Pointer to the Wrong Database Name

The **pin_setup** script cannot connect to the database, and the error message in the DM log file shows that the DM is trying to connect to the incorrect database.

Possible Cause

The **\$MAIN_DB{'alias'}** entry in the **pin_setup.values** file does not match the database alias.

Solution

Enter the correct name for your database; for example, **pindbhostname**, in the **\$MAIN_DB{'alias'}** entry of the **pin_setup.values** file. Re-run the **pin_setup** script.

Problem: Cannot Log In to the Database

The **pin_setup** script cannot log in to the BRM database. The error message indicates an invalid user name or password.

Possible Cause

The **\$MAIN_DB{'user'}** and **\$MAIN_DB{'password'}** entries in the **pin_setup.values** file do not specify the correct user name and password for the BRM database. The default BRM user name and password is **pin**.

Solution

First, verify that you can connect to the BRM database by using the user name and password you want. If you cannot connect:

1. Use SQL statements to set up the user and password for the BRM database.
2. Enter the correct user name and password for the BRM database in the **\$MAIN_DB{'user'}** and **\$MAIN_DB{'password'}** entries in the **pin_setup.values** file.
3. Re-run the **pin_setup** script.

Problem: Out of Memory on UNIX

The **pin_setup** script cannot start the DM, and the DM's error log file refers to "bad shmget", "bad shmat", or another error related to memory.

Possible Cause

There is not enough shared memory on the database server.

HP-UX IA64 Solution

Use the HP-UX SAM utility to increase the **SEMMNI**, **SEMMNS**, or **SEMMAP** values. For example:

```
SEMMNI = 1000  
SEMMNS = 1000  
SEMMAP = 1002
```

Note: If multiple applications are running on the host computer, increase these values based on each application's shared memory requirements.

Solaris Solution

Increase the shared memory value in the **/etc/system** file. For example, type the following in a text editor, such as **vi**:

```
set shmsys:shminfo_shmmax=4294967295
```

Linux Solution

Increase the shared memory value in the **/etc/sysctl.conf** file. Type the following in a text editor:

1. Log on as root.
2. Open the **/etc/sysctl.conf** file.

3. Add the following lines to the end of the file, or modify the values if these lines are already present:

```
kernel.shmmax = 536870912  
kernel.shmall = 536870912
```

4. Run `sysctl -p` from the unix prompt.

Installing Multiple BRM Instances on One System for Testing

This chapter provides information to help developers test their Oracle Communications Billing and Revenue Management (BRM) system configuration.

Installing and Configuring Multiple Instances of BRM on One Machine

You can install multiple instances of BRM on one machine to reduce the amount of hardware needed to test the BRM software. To set up multiple instances of BRM on one machine, perform the following steps:

1. [Creating Multiple Users](#)
2. [Installing and Configuring Oracle](#)
3. [Installing Multiple Instances of BRM](#)
4. [Configuring Each BRM Instance](#)

Creating Multiple Users

Create a user for each instance of BRM you want to install. For example, to install four instances of BRM, create users **pin1**, **pin2**, **pin3**, and **pin4**.

To create multiple users:

1. Log in as **root**:

```
% su - root
```

2. Create each user. For example, type the following to create four users:

For HP-UX IA64, Linux, and Solaris:

```
# useradd -g pin -s /bin/csh -d BRM_Home/pin1 pin1
# useradd -g pin -s /bin/csh -d BRM_Home/pin2 pin2
# useradd -g pin -s /bin/csh -d BRM_Home/pin3 pin3
# useradd -g pin -s /bin/csh -d BRM_Home/pin4 pin4
```

3. Create a password for each user.

For example, type the following to create the **pin1** password:

```
# passwd pin1
```

Installing and Configuring Oracle

Before you install BRM, you must install Oracle and configure it for multiple instances of BRM. Install and configure Oracle according to the instructions in ["Installing and Configuring the Oracle Database"](#), except create your BRM tablespaces and BRM users as described in this section.

Creating Tablespaces for Each User

You must create unique data, index, and temporary tablespaces for each instance of BRM you install. The examples in this document use the following tablespaces:

- **pinN00** (for data)
- **pinxN00** (for indexes)
- **PINTEMPN** (for a temporary tablespace)

To create tablespaces for each user:

1. Create a directory for the tablespaces, such as **/u02/oradata/pindb**.

This directory is referred to as *table_location*.

2. Connect to the Oracle database by using SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

3. Create a data, index, and temporary tablespace for each BRM user.

Repeat the following commands for each BRM instance:

```
SQL> create tablespace pin00 datafile 'table_location/pin00.dbf'
      size 600M reuse autoextend on extent management
      local uniform size 64K segment space management
      auto;
```

Tablespace created.

```
SQL> create tablespace pinx00 datafile 'table_location/pinx00.dbf'
      size 400M reuse autoextend on extent management
      local uniform size 64K segment space management
      auto;
```

Tablespace created.

```
SQL> create temporary tablespace pintemp tempfile
      'table_location/PINTEMP.dbf' size 100M reuse autoextend on;
```

Tablespace created.

Creating Multiple BRM Users for Oracle

Create the BRM users who can access the Oracle database. The examples in this document use **pinN**, but you can use another naming scheme.

To create multiple BRM users for Oracle:

1. Connect to the Oracle database by using SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

2. Perform the following for each instance of BRM you will install:

```
SQL> create user pinN identified by password;
```



```

User created.

SQL> grant resource, connect to pinN;

Grant succeeded.

SQL> alter user pin default tablespace pinN00;

User altered.

SQL> alter tablespace PINTEMP temporary;

Tablespace altered.

SQL> alter user pin temporary tablespace PINTEMP;

User altered.

```

3. Type **exit** to exit SQL*Plus.

Installing Multiple Instances of BRM

Note: If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

To install multiple instances of BRM on one machine:

1. If the Third-Party software package is not installed, install it.
See ["Installing the Third-Party Software"](#).
2. Log in as user **pinN**.

```
% su - pinN
```
3. Download the software to a temporary directory (*temp_dir*).
4. 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
```

5. Stop all BRM processes. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
6. Go to the *temp_dir* directory and enter this command:

```
7.5.0_Portal_Base_platform_opt.bin
```

where *platform* is the operating system name.

Note: You can use the **-console** option to run the installation in a 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 patch.

- Log in separately for each instance of BRM that you need to install. For example, log in as **pin1** and install the first instance of BRM. Then, log in as **pin2** and install the second instance of BRM, and so on.

Follow the instructions displayed during installation. Your responses are written to the *BRM_Home/setup/pin_setup.values* file. [Table 15–1](#) lists the setup prompt descriptions.

Table 15–1 Prompt Descriptions

Prompt	Description
Setup type:	Enter the type of installation you prefer. The default is Typical . <ul style="list-style-type: none"> Enter Typical for development and production systems. Enter Demo for test or demonstration systems. This is the quickest option and asks you the least number of questions. Enter Custom for production systems. The installer lets you install a subset of the BRM components.
Directory name:	Enter the directory in which to install BRM. The default is /opt/portal/7.5 .
Create BRM Database Tablespaces?	Enter whether you want the installer to create default tablespaces for you. Enter No to create custom tablespaces manually. You must create your tablespaces <i>before</i> you run the pin_setup script. Do not select Yes . Selecting Yes may cause installation to fail.
Database alias:	Enter your database alias. The default is pin\$dbhostname .
Oracle DM database number:	Enter the database number. The default is 0.0.0.1 .
Oracle DM port:	Enter the port number for the BRM Data Manager (DM). The default is 12950 .
Database username:	Enter your database user name. The default is pin . Important: Make sure you enter the user name for pin1 , then pin2 , and so on.
Database password:	Enter your database password. The default is pin . Important: Make sure you enter the password for pin1 , then pin2 , and so on.
Oracle DM character set:	Enter the character set your database uses. BRM strongly recommends using the UTF8 character set. The default is UTF8 .
Storage Model used for Oracle tablespaces:	Enter the desired size of your database. The default is Small . <ul style="list-style-type: none"> Enter Test for test or demonstration databases smaller than 700 MB. Enter Small for demonstration databases smaller than 1.5 GB. Enter Medium for production databases smaller than 30 GB. Enter Large for production databases larger than 30 GB.
Tablespace name for Tables:	Enter the name of your data tablespace. The default is pin00 .
Tablespace name for Indexes:	Enter the name of your index tablespace. The default is pinx00 .

Table 15–1 (Cont.) Prompt Descriptions

Prompt	Description
Drop the BRM tables?	<p>Enter whether you want to drop the database tables. The default is No.</p> <p>If you select Yes, the installer drops all existing tables on your system. This results in irrecoverable loss of data. Do not use this unless you have backed up all of your existing data.</p> <p>If you select No, the installer uses your existing BRM tables.</p> <p>In test systems, select Yes to reinitialize the database.</p>
Partition tables?	<p>Specify whether you want to enable partitioning. The default is Yes.</p> <p>Caution: To partition tables, you must have Oracle Partitioning installed. If you select Yes but do not have Oracle Partitioning installed, the BRM setup program fails when it tries to create partitions.</p> <ul style="list-style-type: none"> If you select Yes, the following classes are automatically enabled for partitioning: event, bill, invoice, item, journal, newsfeed, sewa, and user activity. To enable other classes for partitioning during installation, see "Enabling Different Classes for Partitioning during Installation". <p>Note: This sets the \$ENABLE_PARTITION parameter to Yes in the pin_setup.values file.</p> <ul style="list-style-type: none"> If you select No, you can enable partitioning after installation. See <i>"Converting Nonpartitioned Classes to Partitioned Classes"</i> in <i>BRM System Administrator's Guide</i>. If you plan to use Rated Event (RE) Loader to load prerated events, you must partition your event tables. <p>For more information, see "Partitioning Tables" in <i>BRM System Administrator's Guide</i>.</p>
Add 12 fixed (monthly) partitions to all event tables?	<p>This prompt is displayed only if you enter Yes to the "Partition tables?" prompt.</p> <p>Specify whether you want the installer to add 12 monthly partitions to your event tables:</p> <ul style="list-style-type: none"> Enter Yes to have the installer add 12 monthly partitions, a historic partition, and a last partition to your event tables. <p>This sets the \$SETUP_CREATE_PARTITIONS parameter to Yes in the pin_setup.values file.</p> <ul style="list-style-type: none"> Enter No if you want the installer to add only a historic partition and a last partition to the event tables. You can use this partitioning layout for a simple test or demonstration system. For a production system, however, you must add purgeable partitions after installation is complete and before the system generates events.
CM Port	<p>Enter the port number for the Connection Manager (CM). The default is 11960.</p>

- Go to the directory where you installed the BRM software and source the **source.me** file:

Bash shell:

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

C shell:

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

- To further configure BRM, such as changing the default currency and country, edit the **BRM_Home/setup/pin_setup.values** file.

This file stores the information you provided to the installer and a number of database and add-on component parameters.

Each instance of BRM is installed in the *BRM_Home/pinN* directory, where N represents the instance number. For example, the installation program copies BRM to the following directories when you install four instances of BRM in the default BRM directory, */opt/portal/7.5*:

```
/opt/portal/7.5/pin1
/opt/portal/7.5/pin2
/opt/portal/7.5/pin3
/opt/portal/7.5/pin4
```

Configuring Each BRM Instance

Follow these steps for each instance of BRM you want to install on your machine:

1. Log in as **root** and change the permissions for the *BRM_Home/pinN* directory and its contents from **pin** to **pinN**:

```
% su - root
# cd BRM_Home
# chown -R pin pinN
```

2. Edit the **pin_setup** file.

- a. Go to the *BRM_Home/pinN/setup* directory, change permissions for the **pin_setup** file, and then open the file in a text editor such as **vi**:

```
% cd BRM_Home/setup
% chmod 755 pin_setup
% vi pin_setup
```

- b. Edit the **VERSION** and **PINUSER** entries to include the **pinN** directory:

```
VERSION = 7.5/pinN
PINUSER = pinN
```

- c. Save and close the file.

3. Edit the **pin_setup.values** file.

- a. Go to the *BRM_Home/pinN/setup* directory and open the **pin_setup.values** file in a text editor such as **vi**:

```
% cd BRM_Home/setup
% vi pin_setup.values
```

- b. Modify all path references to include the **pinN** directory:

```
$PIN_HOME = "/opt/portal/7.5/pinN"
$PIN_LOG_DIR = "/var/portal/7.5/pinN"
$PIN_TEMP_DIR = "/opt/portal/7.5/pinN/setup"
```

- c. Save and close the file.

4. Go to the *BRM_Home/setup* directory and run the **pin_setup** script:

```
% cd BRM_Home/setup
% ./pin_setup
```

5. Check the **pin_setup.log** file for status and errors.

6. Verify that BRM was installed and set up correctly by creating an account with Customer Center.
7. Repeat steps 1 through 6 for each instance of BRM you installed on your machine.

Reinitializing the Database

You can reinitialize the BRM database, including tables, indexes, and triggers, and return it to its original condition. You might do this, for example, to clean out a test database.

Caution: When you reinitialize a database, you completely remove existing data from the database. When the data is removed, you cannot restore it. Perform this task only if you are certain you will not need to access any data in the database or you have backed up the data and have confirmed that you can restore it.

Reinitializing BRM Server and Optional Component Data

To reinitialize all BRM data, including data in your core BRM tables and optional component tables:

1. Stop all BRM processes. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
2. Edit the **pin_setup.values** file.
 - a. Log in as **pin**, go to the *BRM_Home/setup* directory, and open the **pin_setup.values** file in a text editor such as **vi**:


```
% su - pin
% cd BRM_Home/setup
% vi pin_setup.values
```
 - b. Change the **\$SETUP_DROP_ALL_TABLES** and **\$SETUP_INIT_DB** entries to **YES**:


```
$SETUP_DROP_ALL_TABLES = "YES";
$SETUP_INIT_DB = "YES";
```
 - c. Save and close the file.
3. Run the **pin_setup** script:


```
% cd BRM_Home/setup
% ./pin_setup
```
4. Drop the optional component tables from your database.
5. Using SQL*Plus, log in to your database as the **SYSTEM** user and execute the following command using the information in [Table 15-2](#):

```
SQL> @path/file_name
```

Table 15–2 Optional Component Drop Source File Location and Name

Optional Component	Path	File Name
Content Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_content_oracle.source
GPRS Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_gprs_oracle.source
GSM Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_service_order_oracle.source drop_tables_settlement_oracle.source
Invoice DM	<i>BRM_Home/sys/dm_invoice/data</i>	drop_tables.source
Number Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_num_oracle.source
Rated Event Loader	<i>BRM_Home/sys/dd/data</i>	drop_tables_rel_oracle.source
Resource Reservation Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_reservation_oracle.source
SIM Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_sim_oracle.source
Vertex Quantum Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telephony_oracle.source
Vertex Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telephony_oracle.source
SMS Settlement Reports	<i>BRM_Home/sys/dd/data</i>	drop_tables_sms_settle_report_oracle.source
Services Framework AAA Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telco_aaa_oracle.source
GSM AA Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_gsm_aaa_oracle.source
Suspense Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_suspense_oracle.source
Services Framework Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telco_oracle.source drop_tables_config_accountera_oracle.source
IP Address Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_ip_oracle.source drop_tables_apn_oracle.source
Voucher Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_voucher_oracle.source
Collections Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_collections_oracle.source

6. Start all BRM processes.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

All core BRM tables and optional component tables have been dropped from your system. You can start adding test accounts to your database and continue testing.

Reinitializing Optional Component Data Only

To reinitialize data from your optional component tables, but keep the data in your core BRM tables:

1. Stop the CM and DM processes.
2. Enable writing of the data dictionary objects in your Oracle DM configuration file:
 - a. Open your Oracle DM configuration file (*BRM_Home/sys/dm_oracle/pin.conf*).
 - b. Make sure the following entries are set to 1:


```
- dm_dd_write_enable_objects 1
```

- dm dd_write_enable_fields 1
- dm dd_write_enable_portal_objects 1

c. Save and close the file.

3. Stop and restart the CM and Oracle DM processes.

4. Delete the BRM data dictionary objects for each optional component.

You can find the data dictionary objects for each component in the following files listed in [Table 15-3](#):

Table 15-3 Optional Component Data Dictionary Drop Source File Location and Name

Optional Component	Path and File Name
Content Manager	<i>BRM_Home/sys/dd/data/dd_objects_content.source</i>
GPRS Manager	<i>BRM_Home/sys/dd/data/dd_objects_gprs.source</i>
GSM Manager	<i>BRM_Home/sys/dd/data/dd_objects_service_order.source</i> <i>BRM_Home/sys/dd/data/dd_objects_telco_gsm.source</i> <i>BRM_Home/sys/dd/data/dd_objects_settlement.source</i> <i>BRM_Home/sys/dd/data/dd_objects_telco.source</i> <i>BRM_Home/sys/dd/data/dd_objects_config_accountera.source</i>
Invoice DM	<i>BRM_Home/sys/dm_invoice/data/dd_objects.source</i>
Number Manager	<i>BRM_Home/sys/dd/data/dd_objects_num.source</i>
Rated Event Loader	<i>BRM_Home/sys/dd/data/dd_objects_rel.source</i>
Resource Reservation Manager	<i>BRM_Home/sys/dd/data/dd_objects_reservation.source</i>
SIM Manager	<i>BRM_Home/sys/dd/data/dd_objects_sim.source</i>
TelcoTax Manager	<i>BRM_Home/sys/dd/data/dd_objects_telephony.source</i>
Vertex Quantum Manager	<i>BRM_Home/sys/dd/data/dd_objects_telephony.source</i>
Vertex Manager	<i>BRM_Home/sys/dd/data/dd_objects_telephony.source</i>
SMS Settlement Reports	<i>BRM_Home/sys/dd/data/dd_objects_sms_settle_report.source</i>
Suspense Manager	<i>BRM_Home/sys/dd/data/dd_objects_suspense.source</i>
GSM AAA Manager	<i>BRM_Home/sys/dd/data/dd_objects_gsm_aaa.source</i>
Services Framework AAA Manager	<i>BRM_Home/sys/dd/data/dd_objects_telco_aaa.source</i>
IP Address Manager	<i>BRM_Home/sys/dd/data/dd_objects_ip.source</i> <i>BRM_Home/sys/dd/data/dd_objects_apn.source</i>
Collections Manager	<i>BRM_Home/sys/dd/data/dd_objects_collections.source</i>

a. Create an flist that contains the POID of the objects you want to delete.

See "Understanding flists and Storable Classes" in *BRM Developer's Guide*.

b. Execute the PMC_OP_SDK_DEL_OBJ_SPECS opcode with the input flist you created.

See "Executing Opcodes" in *BRM Developer's Guide*.

5. Stop the CM and Oracle DM processes.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

6. Drop the optional component tables from your database.

7. Using SQL*Plus, log in to your database as the SYSTEM user and execute the following command using the values in [Table 15-4](#):

```
SQL> @path/file_name
```

Table 15-4 Optional Component Drop Source File Location and Name

Optional Component	Path	File Name
Content Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_content_oracle.source
GPRS Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_gprs_oracle.source
GSM Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_service_order_oracle.source drop_tables_settlement_oracle.source
Invoice DM	<i>BRM_Home/sys/dm_invoice/data</i>	drop_tables.source
Number Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_num_oracle.source
Rated Event Loader	<i>BRM_Home/sys/dd/data</i>	drop_tables_rel_oracle.source
Resource Reservation Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_reservation_oracle.source
SIM Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_sim_oracle.source
Vertex Quantum Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telephony_oracle.source
Vertex Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telephony_oracle.source
SMS Settlement Reports	<i>BRM_Home/sys/dd/data</i>	drop_tables_sms_settle_report_oracle.source
Services Framework AAA Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telco_aaa_oracle.source
GSM AA Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_gsm_aaa_oracle.source
Suspense Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_suspense_oracle.source
Services Framework Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_telco_oracle.source drop_tables_config_accountera_oracle.source
IP Address Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_ip_oracle.source drop_tables_apn_oracle.source
Voucher Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_voucher_oracle.source
Collections Manager	<i>BRM_Home/sys/dd/data</i>	drop_tables_collections_oracle.source

8. Restore the entries in your Oracle DM configuration file to their original value.

- a. Open your Oracle DM configuration file (*BRM_Home/sys/dm_oracle/pin.conf*).

- b. Return the following entries to their original value:

```
- dm dd_write_enable_objects 0
- dm dd_write_enable_fields 0
- dm dd_write_enable_portal_objects 0
```

- c. Save and close the file.

9. Stop and restart the CM and Oracle DM processes.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

All optional component tables have been dropped from your system. You can start adding test accounts to your database and continue testing.

Removing BRM Data from the Database

Follow these steps to completely remove BRM data, including tables, indexes, and triggers, from the Oracle database:

Caution: When you remove the data, you cannot restore it. Perform this task only if you are certain you will not need to access any data in the database or you have backed up the data and have confirmed that you can restore it.

1. Use SQL to connect to the database as the system user:

```
% sqlplus system/manager@databaseAlias  
SQL>
```

2. Stop all BRM processes.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

3. Enter the following command, replacing *pin_user* with the user you created for BRM, such as **pin**:

```
SQL> DROP USER pin_user CASCADE;
```

4. Log in to the database server as *pin_user*.

If you receive an error indicating an invalid user name, the operation was successful.

Uninstalling BRM

This chapter describes the tasks you perform to uninstall the Oracle Communications Billing and Revenue Management (BRM) software, the server application, and client applications from your computer.

For details on how to uninstall or reinstall Oracle database, see the database vendor's documentation for your platform.

Uninstalling the BRM Software

Uninstalling BRM requires three tasks:

1. [Uninstalling Optional Components](#)
2. [Uninstalling BRM](#)
3. [Uninstalling BRM Client Applications](#)

Uninstalling Optional Components

To uninstall optional components,

1. Back up the BRM database.
See "[Maintaining a BRM Database](#)".
2. Stop all BRM daemons, processes, and managers.
See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
3. Log in as user **pin**.
4. Go to the directory where you installed the Third-Party package and source the **source.me** file:

Bash shell:

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


C shell:

```
source source.me.csh
```
5. Run the *BRM_Home/uninstaller/ProductName/uninstaller.bin* program.

Note: You can use the **-console** parameter to run the uninstallation in command-line mode.

6. Select the features you want to uninstall, and follow the interactive prompts.

Note: Optional components must be uninstalled before uninstalling BRM.

Uninstalling BRM

To uninstall BRM,

1. Back up the BRM database.
See "[Maintaining a BRM Database](#)".
2. Stop all BRM daemons, processes, and managers. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
3. Log in as user **pin**.
4. Go to the directory where you installed the Third-Party package and source the **source.me** file:

Bash shell:

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

C shell:

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

5. Run the *BRM_Home/uninstaller/Portal_Base/uninstaller.bin* program.

Note: You can use the **-console** parameter to run the uninstallation in command-line mode.

6. Select the features you want to uninstall, and follow the interactive prompts.

Uninstalling BRM Client Applications

This section describes how to uninstall BRM client applications on UNIX and Windows.

Uninstalling UNIX Client Applications

To uninstall BRM client applications on UNIX, you must manually delete the files from your computer.

Uninstalling Windows Client Applications

To uninstall BRM client applications on Windows,

1. Back up the BRM database.
See "[Maintaining a BRM Database](#)".
2. Do one of the following to start the uninstaller:
 - (Windows 8.1) Use the Windows uninstall feature.
 - (Other Windows versions) From the start options, select **Uninstall** *ProductName*, which is under **Portal** or use the Windows uninstall feature.

3. In the Uninstall Portal Components dialog, select one of the following:
 - **View Components Only:** This shows a list of BRM products currently installed on your Windows machine.
 - **View Components and Features:** This expands each BRM product and its components. This is useful for uninstalling individual components.
4. Select the component or feature you want to uninstall, and click **Uninstall**.
5. Follow the instructions on the screen.

Installation Utilities

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

pin_setup

Use this utility to configure the BRM Pipeline Manager.

See ["Running the pin_setup Utility"](#).

Note: This utility does not access the BRM database, so it does not need a **pin.conf** file.

Important: Pipeline Configuration Manager is an optional component.

Location

Pipeline_home/**bin**

where *Pipeline_home* is the directory where the Pipeline Manager software is installed.

Syntax

```
pin_setup [-recover_last] [-runone step_name] [-h] [-notee]
```

Parameters

-recover_last

Restarts the configuration. The configuration begins where it stopped.

Important: This option recovers from the last point of failure. It does not roll back the changes made by the successful steps.

-runone *step_name*

Runs the files from a single step directory.

-h

Displays online help for the **pin_setup** utility.

-notee

Turns off displaying the progress as the utility runs.

Results

The utility records results in two log files in the *Pipeline_home*/**setup/log** directory:

- **pin_setup.log:** All messages and output from the scripts that the utility runs.
- **steptracker.log:** Each step that has been processed.

uninstaller

Use this utility to uninstall the BRM server software, client applications, and optional components from a single machine. If your BRM system is distributed among multiple machines, you must run the **uninstaller** utility on each machine.

This utility does not remove all BRM files and directories from your system or reverse changes made to your configuration files and database. For a list of files and directories that you must remove manually, see "[Uninstalling Optional Components](#)".

Important: To use the **uninstaller** on Solaris, you must first install the latest patch for your version of Solaris.

Location

BRM_Home/**uninstaller**

Syntax

```
uninstaller -log BRM_Home/uninstaller/uninst
[ + | - | = ]product product_name
[ + | - | = ]component component_name product_name
read text_file_name
```

Parameters

-log *BRM_Home/uninstaller/uninst*

Logs status and error messages to the **uninst** log file.

+

Registers the product or component to uninstall.

-

Points to the product or component to uninstall.

=

Verifies that the product or component is registered for uninstallation.

Commands

- **product** *product_name*

Uninstalls the specified product. You can only uninstall one product at a time.

The **Infranet.prod** file, located in the directory where you downloaded and extracted your BRM software, stores the names of all products installed on your system. *product_name* must match one of the names in this file.

For example, to uninstall BRM, type:

```
% uninstaller -log BRM_Home/uninstaller/uninst -product Portal_Base
```

- **component** *component_name product_name*

Uninstalls the specified component. You must specify the component name and the parent product.

The **comps** directory, located in the directory where you downloaded and extracted your BRM software, lists the names of all components installed on your system. *component_name* must match one of the file names, minus the extension, in this directory.

The **Infranet.prod** file, located in the directory where you downloaded and extracted your BRM software, stores the names of all products installed on your system. *product_name* must match one of the names in this file.

For example, to remove the Connection Manager (CM) only, type:

```
% uninstaller -log BRM_Home/uninstaller/uninst -component CM Portal_Base
```

- **read** *text_file_name*

Reads the text file and performs any batch operations specified in the text file.

Results

The **uninstaller** utility doesn't notify you whether it was successful or unsuccessful. You must look in your directory structure to see if your files were removed.

Part III

Installing Pipeline Manager

Part III describes how to install Oracle Communications Billing and Revenue Management (BRM) Pipeline Manager. It contains the following chapters:

- [Installing Pipeline Manager](#)
- [About Pipeline Configuration Manager](#)
- [Testing Pipeline Manager](#)

Installing Pipeline Manager

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

You should be familiar with the following topics:

- Oracle database administration and commands.
- UNIX system administration and commands.
- The Pipeline Manager framework. See "Configuring Pipeline Manager" in *BRM System Administrator's Guide*.
- How Pipeline Manager works. See "About Pipeline Rating" in *BRM Configuring Pipeline Rating and Discounting*.

Installation Overview

To install and configure Pipeline Manager, follow the steps in these sections:

1. [Determining Your System Requirements](#)
2. [Creating a User and Configuring Environment Variables](#)
3. [Setting the Maximum Allowed Number of Open Files](#)
4. [Installing Pipeline Manager](#)
5. [Installing Pipeline Configuration Manager](#)
6. [Installing Roaming Settlement Package](#)
7. [Increasing Heap Size to Avoid "Out of Memory" Error Messages](#)
8. [Configuring an Oracle Pipeline Manager Database](#)
9. [\(Solaris\) Configuring Memory Allocation and Block Transfer Mode on Solaris Systems](#)

After you complete the installation, configure and test Pipeline Manager, see:

- [About Pipeline Configuration Manager](#)
- [Testing Pipeline Manager](#)

Determining Your System Requirements

Before you install Pipeline Manager, ensure that requirements described in this section are met.

Supported Platforms

For information on supported platforms and required patches, see ["BRM Software Compatibility"](#).

Hardware Requirements

Pipeline Manager requires the following hardware listed in [Table 18–1](#):

Table 18–1 Pipeline Manager Required Hardware

Component	Requirements
CPU	4 or more CPUs
RAM	More than 4 GB (to use 54-bit)
Disk Type	RAID disc array (RAID 5 hardware solution with appropriate cache strongly recommended, RAID 0 software solution)

Note: The more pipelines you configure and the more CPUs you use, the more important it is to put input and output on systems that are managed by different Controllers.

Third-Party Software Requirements

[Table 18–2](#) describes the required third-party software.

Important: These software components are not part of the Pipeline Manager package or license. You must obtain these products separately.

Table 18–2 Pipeline Manager Required Third-Party Components

Pipeline Manager Requirements	Third-Party Component
Database server	(Oracle systems) Oracle 10g server, or 11g server
Database client	Oracle 10g or Oracle 11g (R1 or R2)
GUI server	Java Runtime Environment (JRE) 1.6.0_26

For required OS patch levels, see ["BRM Software Compatibility"](#).

Creating a User and Configuring Environment Variables

Follow these steps to create a Pipeline Manager user and set up system environment variables on a system:

1. Create a user that owns the Pipeline Manager software. The examples in this document use the default user **integrate** with the bash shell as the default shell.

Note: You must create a Pipeline Manager user and set the user's environment before installing Pipeline Manager.

2. Log in as user **integrate**.
3. Go to the *Pipeline_home* directory.

Note: The default *Pipeline_home* directory is */opt/ifw*.

4. Open the **source.me.sh** file for your shell in a text editor.

Note: The **source.me** file is for a bash shell. If you use a C shell, open the **source.me.csh** file.

5. Set the following environment variables for Pipeline Manager using the information in [Table 18–3](#):

Table 18–3 Pipeline Manager Environment Variables

Environment Variable	Description
IFW_EVENTHANDLER_PORT	<p>The port number on which the event handler daemon listens for events.</p> <p>Important:</p> <ul style="list-style-type: none"> ■ If you are starting more than one framework process, change the value of this parameter before starting each process. Each process must have a unique event handler port for all users on a host. A framework process will not start if it cannot start the event handler daemon, and the event handler daemon will not start if it cannot listen on the specified port. ■ Do not set this variable to a well-known port number, such as port 11960 used by BRM.
IFW_HOME	<p>The directory where the Pipeline Manager software is installed.</p> <p>The default installation directory for Pipeline Manager is <i>/opt/ifw</i>.</p> <p>Note: This documentation refers to this directory as the <i>Pipeline_home</i>.</p>
INT_PERL_LIB	<p>Set to <i>THIRD_PARTY_SOFTWARE/tools/PerlLib</i>, where <i>THIRD_PARTY_SOFTWARE</i> is the directory where you installed the Third-Party software.</p> <p>The default directory is <i>/opt/portal/ThirdParty</i>.</p>
LD_LIBRARY_PATH	<p>The library path.</p> <p>Set this to include <i>Pipeline_home/lib</i>.</p> <p>If your system already has this variable set to another value for other applications, Pipeline Manager might not find the proper libraries.</p> <p>To determine if a pre-existing value is present, enter the following command:</p> <pre>echo \$LD_LIBRARY_PATH</pre> <p>If the variable is already set in your system, add the new variable as follows:</p> <pre>export LD_LIBRARY_PATH=\${LD_LIBRARY_PATH};Pipeline_home/lib</pre> <p>C shell:</p> <pre>setenv LD_LIBRARY_PATH \${LD_LIBRARY_PATH};Pipeline_home/lib</pre> <p>Important: After your first upgrade reset the LD_LIBRARY_PATH environment variable to the following:</p> <pre>setenv LD_LIBRARY_PATH \${LD_LIBRARY_PATH};BRM_Home/lib;Pipeline_home/lib</pre> <p>where <i>BRM_Home/lib</i> must come before <i>Pipeline_home/lib</i>, separated by a semicolon.</p>

Table 18–3 (Cont.) Pipeline Manager Environment Variables

Environment Variable	Description
LD_LIBRARY_PATH_64 (Solaris)	<p>The library path.</p> <p>Set this to include <i>Pipeline_home/lib</i>.</p> <p>If your system already has this variable set to another value for other applications, Pipeline Manager might not find the proper 64-bit libraries.</p> <p>To determine if a pre-existing value is present, enter the following command:</p> <pre>echo \$LD_LIBRARY_PATH_64</pre> <p>If the variable is already set in your system, add the new variable as follows:</p> <pre>export LD_LIBRARY_PATH_64=\${LD_LIBRARY_PATH_64};Pipeline_home/lib</pre> <p>C shell:</p> <pre>setenv LD_LIBRARY_PATH_64 \${LD_LIBRARY_PATH_64};Pipeline_home/lib</pre>
LIBPATH (AIX)	Set this to include <i>Pipeline_home/lib</i> .
LD_PRELOAD_64 (Solaris)	A variable that can be used to configure libumem memory allocation. Set using the ifw-start script. See " libumem Memory Allocator ".
MALLOC_TRIM_THRESHOLD_ MALLOC_MMAP_MAX_ MALLOC_TOP_PAD_ (Linux only)	<p>On Linux Pipeline Manager platforms, modify the MALLOC_TRIM_THRESHOLD_, MALLOC_MMAP_MAX_, and MALLOC_TOP_PAD_ environment variables with these values:</p> <ul style="list-style-type: none"> ■ MALLOC_TRIM_THRESHOLD_ = -1 ■ MALLOC_MMAP_MAX_ = 0 ■ MALLOC_TOP_PAD_ = 268435456 <p>For more information on these variables, see the Linux documentation Web site (http://www.linux.com/learn/docs).</p>
_M_ARENA_OPTS _M_CACHE PTHREAD_SCOPE_SYSTEM (HP-UX only)	<p>On HP-UX IA64 Pipeline Manager platforms, modify the _M_ARENA_OPTS, _M_CACHE_OPTS, and PTHREAD_SCOPE_SYSTEM environment variables with these values:</p> <ul style="list-style-type: none"> ■ _M_ARENA_OPTS = 32:4 ■ _M_CACHE_OPTS = 40:12:1 ■ PTHREAD_SCOPE_SYSTEM = 1 <p>Important: To achieve acceptable system performance:</p> <ul style="list-style-type: none"> ■ You <i>must</i> set the _M_CACHE_OPTS environment variable. ■ Do not set the _M_SBA_OPTS environment variable. <p>For more information on these variables, see the Hewlett-Packard documentation.</p>
NLS_LANG	<p>Set this to LANG American_America.AL32UTF8.</p> <p>Important: You must use American_America as the language and territory regardless of your locale and the UTF8 or AL32UTF8 character set.</p> <p>BRM 7.5 supports AL32UTF8 as its default character set. It also continues to support the UTF8 character set for BRM installations that are being upgraded to BRM 7.5 from previous versions. The unicode character set AL32UTF8 is recommended for all new BRM 7.5 deployments.</p>

Table 18–3 (Cont.) Pipeline Manager Environment Variables

Environment Variable	Description
PATH	The Pipeline Manager executable path. Set this to include <i>Pipeline_home/bin</i> .
SHLIB_PATH (HP-UX IA64 only)	The library path. Set this to include <i>Pipeline_home/lib</i> .
IFW_EVENTHANDLER_PORT	The port number on which the event handler daemon listens for events. Important: <ul style="list-style-type: none"> ■ If you are starting more than one framework process, change the value of this parameter before starting each process. Each process must have a unique event handler port for all users on a host. A framework process will not start if it cannot start the event handler daemon, and the event handler daemon will not start if it cannot listen on the specified port. ■ Do not set this variable to a well-known port number, such as port 11960 used by BRM.

6. Save and close the updated file.
7. Update the environment for the current shell session:

For bash shell:

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

C shell:

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

Setting the Maximum Allowed Number of Open Files

To avoid causing a failure of Pipeline Manager, you must configure the maximum number of pipeline files allowed per process in the kernel. The recommended value is 2048. You should also set the maximum number of open files allowed for the system to 20480 (ten times the number of files per process).

To modify the number of open files allowed:

- [\(Linux\) Setting Maximum Open Files on Linux](#)
- [\(Solaris\) Setting Maximum Open Files on Solaris](#)
- [\(HP-UX IA64\) Setting Maximum Open Files on HP-UX IA64](#)
- [\(AIX\) Setting Maximum Open Files on AIX](#)

(Linux) Setting Maximum Open Files on Linux

To set the maximum open files on Linux:

1. Log on as **root**.
2. Open the system file (*/etc/sysctl.conf*).
3. Add the following lines to the end of the file, or modify the values if these lines are already present:

```
# sets the hard limit on file descriptors:
fs.file-max = 2605192
```

4. Run `sysctl -p` to reload all the settings from the system file.

(Solaris) Setting Maximum Open Files on Solaris

To set the maximum open files on Solaris:

1. Log on as **root**.
2. Open the system file (`/etc/system`).
3. Add the following lines to the end of the file, or modify the values if these lines are already present:

```
* sets the hard limit on file descriptors:  
set rlim_fd_max = 20480  
* sets the soft limit on file descriptors:  
set rlim_fd_cur = 2048
```

4. Restart your computer to enable the new kernel parameters.

(HP-UX IA64) Setting Maximum Open Files on HP-UX IA64

To set the maximum open files on HP-UX IA64:

1. Log on as **root**.
2. Enter the command to start the System Administration Manager (SAM) program.
For example:

```
/usr/bin/sam
```

3. Double-click the Kernel Configuration icon.
4. Double-click the **Configurable Parameters** icon.
5. Double-click the **maxfiles** parameter and enter **2048** in the **Formula/Value** field.
6. Double-click the **nfiles** parameter and enter **20480** in the **Formula/Value** field.
7. Click **OK**.
8. Select **Actions - Process New Kernel** from the menu bar.
9. Restart your computer to enable the new kernel parameters.

(AIX) Setting Maximum Open Files on AIX

To set the maximum open files on AIX:

1. Log on as **root**.
2. Open the limits file (`/etc/security/limits`).
3. Add the following lines to the end of the file, or modify the values if these lines are already present:

```
* sets the hard limit on file descriptors:  
nofiles_hard = 20480  
* sets the soft limit on file descriptors:  
nofiles = 2048
```

4. Restart any application in a new user session.

Installing Pipeline Manager

This section describes how to install and uninstall Pipeline Manager.

Important: If you are installing Pipeline Manager to replace an identical release (for example, to restore a clean version of the package), you must first uninstall the existing installation. See ["Uninstalling Pipeline Manager"](#).

To install Pipeline Manager:

1. Install the Third-Party software package:
 - If the Third-Party software package is not installed already, install it. See ["Installing the Third-Party Software"](#).
2. Go to the directory where you installed the Third-Party package and source the **source.me**:

For Bash shell:

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

C shell:

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

3. Download the Pipeline Manager package to a temporary directory (*temp_dir*). See ["Downloading the BRM Applications Software"](#).

Important: 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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).

4. Go to the *temp_dir* and enter this command:
 - For Solaris 10 and Linux systems:


```
7.5.0_Pipeline_platform_64_opt.bin
```

where *platform* is **solaris** or **linux**.
 - For Solaris 11 systems:


```
7.5PS15_Pipeline_solaris11_64_opt.bin
```
 - For AIX systems:


```
7.5PS1_Pipeline_aix_64_opt.bin
```
 - For HP-UX IA64 systems:


```
7.5PS5_Pipeline_hpux_ia64_64_opt.bin
```

Note: 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 product. To ensure a command line installation starts, use the **-console** parameter.

5. Follow the instructions displayed during installation.

Note: If you do not specify the installation directory, Pipeline Manager is installed in the `/opt/ifw` directory.

Configuring the Registry File for Linux

If you installed Pipeline Manager on a Linux operating system, you must change the registry file's **AccessLib** entry to point to the correct database library.

To configure the registry file for Linux:

1. Open your system's registry file in a text editor.
2. Change all **AccessLib** entries to **oci10g72**. For example:

```
AccessLib = oci10g72
```

Note: By default, the **AccessLib** entry is set to **oci10g72**.

3. Save and close the file.

Uninstalling Pipeline Manager

To uninstall Pipeline Manager:

1. Run the **uninstaller.bin** program from *Pipeline_home/uninstaller/Pipeline*.
2. Delete the *Pipeline_home/uninstaller* directory and its contents.

Pipeline Manager Directory Structure

Installation creates the following directory structure shown in [Table 18-4](#):

Note: *Pipeline_home* is the default Pipeline Manager installation directory, `/opt/ifw`.

Table 18-4 Directory Structure Created by Pipeline Manager Installation

Directory	Description
<i>Pipeline_home/bin/</i>	Server binaries, such as the main Pipeline Manager binary ifw .
<i>Pipeline_home/conf/</i>	Contains registry files.
<i>Pipeline_home/data/</i>	Contains source and directory files for EDRs.
<i>Pipeline_home/database/</i>	Database creation scripts and database documentation.

Table 18–4 (Cont.) Directory Structure Created by Pipeline Manager Installation

Directory	Description
<i>Pipeline_home/discount/</i>	Balance Data Module transaction and data. See "DAT_BalanceBatch" in <i>BRM Configuring Pipeline Rating and Discounting</i> .
<i>Pipeline_home/etc/</i>	Error messages. Note: You can copy the error messages to another directory and customize them; for example, as preparation for translation into other languages.
<i>Pipeline_home/formatDesc/</i>	External file format definitions and internal container definitions.
<i>Pipeline_home/info/</i>	Info registry, which shows the current system status.
<i>Pipeline_home/instrumentation/</i>	Performance Data collection.
<i>Pipeline_home/iScriptLib/</i>	iScript libraries.
<i>Pipeline_home/lib/</i>	Shared libraries.
<i>Pipeline_home/lib64/</i>	Shared libraries (64-bit)
<i>Pipeline_home/log/</i>	Process log.
<i>Pipeline_home/releaseNotes/</i>	Release notes.
<i>Pipeline_home/samples/</i>	Sample registries that you can use for testing your Pipeline Manager setup.
<i>Pipeline_home/semaphore/</i>	Directory that is checked regularly for semaphores.
<i>Pipeline_home/tools/</i>	The tools such as binaries and Perl scripts.

Installing Pipeline Configuration Manager

This section describes how to install Pipeline Configuration Manager.

For information about Pipeline Configuration Manager, see ["About Pipeline Configuration Manager"](#).

Note: Pipeline Configuration Manager is available for the HP-UX IA64, Linux, Solaris, and AIX operating systems.

Important: If you are installing Pipeline Configuration Manager to replace an identical release (for example, to restore a clean version of the package), you must first uninstall the existing installation. See ["Uninstalling Pipeline Configuration Manager"](#).

Before installing Pipeline Configuration Manager, you must install:

- BRM.
See ["Installing BRM"](#).
- Pipeline Manager.
See ["Installing Pipeline Manager"](#).

To install Pipeline Configuration Manager:

1. If the Third-Party software package is not installed, install it.
See ["Installing the Third-Party Software"](#).
2. Go to the directory where you installed the Third-Party package and source the **source.me**:

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

C shell:

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

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

Important: 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. For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).

4. Go to *temp_dir* and enter the following command:

```
7.5.0_Pipeline_ConfMgr_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.

5. Follow the instructions displayed during installation.

Note: If you do not specify an installation directory, Pipeline Configuration Manager is installed in the **/opt/ifw** directory.

Uninstalling Pipeline Configuration Manager

To uninstall Pipeline Configuration Manager, run the **uninstaller.bin** program from *Pipeline_home/uninstaller/Pipeline_ConfMgr*.

Installing Roaming Settlement Package

This section describes how to install Roaming Settlement Package.

For information about managing settlement for roaming charges, see "About Managing Settlement for Interconnect Charges" in *BRM Configuring Roaming in Pipeline Manager*.

The hardware and software requirements for Roaming Settlement Package are the same as for Pipeline Manager. For more information, see ["Installing Pipeline Manager"](#). In addition to this, install BRM before proceeding.

The Roaming Settlement Package includes the utility and template files for extracting settlement data from the pipeline database and loading it into the BRM database. It also includes the files needed to load SMS settlement data, which is used to generate

SMS settlement reports. For information about SMS settlement reports, see "About Generating SMS Usage Reports" in *BRM Configuring Roaming in Pipeline Manager*.

To install Roaming Settlement Package, see ["Installing Roaming Settlement Package"](#).

Installing Roaming Settlement Package

Note: If you have already installed the feature, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

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.

For information, see ["Increasing Heap Size to Avoid "Out of Memory" Error Messages"](#).

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 the *temp_dir* directory and enter this command:

```
7.5.0_SMSSettlement_Reports_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. When prompted, enter the directory where you want to install the roaming settlements package.

The default directory is **opt/portal/7.5**.

The installation program installs the package files in the specified directory.

5. Go to the directory where you installed the roaming settlements package and source the **source.me** file:

Bash shell:

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

C shell:

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

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

Your Roaming Settlement Package installation is now complete.

Increasing Heap Size to Avoid “Out of Memory” Error Messages

To avoid "Out of Memory" error messages in the log file after installation, increase the maximum heap size used by the Java Virtual Machine (JVM). The exact amount varies greatly with your needs and system resources. By default, the JVM used has a maximum heap size of 60 MB. Increase the maximum heap size to 120 MB by entering the following sample code in a text editor:

```
%IF_EXISTS%("INIT_JAVA_HEAP", "@INIT_JAVA_HEAP@20m") %IF_EXISTS%("MAX_JAVA_HEAP",  
"@MAX_JAVA_HEAP@120m")
```

where **20m** and **120m** indicate the minimum and maximum heap sizes respectively.

Save the file as *Packagename.java* in the temporary directory (*temp_dir*) to which you downloaded the installation software.

Packagename indicates the name of the installation software. For example, if you downloaded the **7.5.0_Pipeline_solaris_64_opt.bin** file on Solaris 10 then, save the file as **7.5.0_Pipeline_solaris_64_opt.java**.

Configuring an Oracle Pipeline Manager Database

This section describes how to configure the Pipeline Manager database on Oracle.

Before proceeding, you should be familiar with executing database scripts.

Before setting up the Oracle database for Pipeline Manager, ensure the following:

- An Oracle database instance is mounted and open.
- You have administrator access to the database instance.

To install and configure the Pipeline Manager database, follow the steps in these sections:

1. [Setting the Environment for the Pipeline Manager Database](#)
2. [Setting Up the Oracle JSA Database Schema](#)
3. [Setting Up the Oracle Pipeline Manager Framework Database Schema](#)
4. [Loading Procedures for FCT_DuplicateCheck](#)
5. [Encrypting the Database Password](#)

6. [\(Solaris\) Configuring Memory Allocation and Block Transfer Mode on Solaris Systems](#)
7. [Loading the Tailor-Made Stored Procedure](#)
8. [Loading the Discount Stored Procedure](#)

Setting the Environment for the Pipeline Manager Database

Before setting up the database schemas for your Oracle Pipeline Manager database, you must configure database environment variables.

1. Open the configuration file for the login shell. This is the file in which your user profile is stored; for example, `.profile` or `.bashrc`. By default it is stored in your home directory.
2. Change the following variables in [Table 18–5](#) to match your Pipeline Manager environment:

Table 18–5 Environment Variables of Pipeline Manager Database

Environment Variable	Description
ORACLE_HOME	Include or set this variable to point to the Oracle installation path.
LD_LIBRARY_PATH	(32-bit systems) Include or set entries to point to the database <code>/lib</code> directories. Example for Oracle databases: <code>LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:\$ORACLE_HOME/lib32:\$ORACLE_HOME/rdbms/lib32</code>
LD_LIBRARY_PATH_64	(64-bit systems) Include or set entries to point to the database <code>/lib</code> directories. Example for Oracle databases: <code>LD_LIBRARY_PATH_64=\$IFW_HOME/lib:\$ORACLE_HOME/lib:\$ORACLE_HOME/rdbms/lib</code>
PATH	Include or set entries to point to the database <code>/bin</code> directory. Example for Oracle databases: <code>\${ORACLE_HOME}/bin</code>

3. Save and close the file.

Setting Up the Oracle JSA Database Schema

This section describes how to run scripts to set up the Oracle JSA database schema.

Run the scripts described in the following steps to set up the database schema for the JSA tables and tablespaces:

Note: All scripts are located in the *Pipeline_home/database/Oracle/Scripts* directory.

1. Open the `JSA_Tablespaces.sql` file with a text editor.
2. Replace all occurrences of the string `***` with the path to the Oracle tablespace data file.
3. Save the file.
4. Log in as user **database administration (DBA)**.

5. Run the **JSA_Tablespaces.sql** script.
This script creates the tablespaces for the JSA server.
 6. Run the **JSA_Roles.sql** script.
This script creates roles and the default JSA user.
 7. Log out and log in as user **JSA**.
 8. Run the **JSA_Create.sql** script.
This script creates the JSA tables.
 9. Run the **JSA_Synonyms.sql** script.
This script creates the JSA public synonyms.
 10. Run the **JSA_Prepare.sql** script.
This script inserts some default values into the tables.
- The Oracle JSQ database schema is now set up.

Setting Up the Oracle Pipeline Manager Framework Database Schema

To set up the database schema for the Pipeline Manager framework work tables and tablespaces:

Note: All scripts are located in the *Pipeline_home/database/Oracle/Scripts* directory.

1. Open the **ifw_Tablespaces.sql** file with a text editor.
2. Replace the occurrences of the string **ORA_DAT_PATH** and **ORA_IDX_PATH** with the path that leads to the *.dbf files shown in the script file.
3. Save the file.
4. Log in as user **DBA**.
5. Run the **ifw_Tablespaces.sql** script.
This script creates the tablespaces for the Pipeline Manager framework.
6. (Optional) Change the default Pipeline Manager user name (*pipeline_user*) from **integrate** to another name:
 - a. Open the **ifw_Roles.sql** file by using a text editor.
 - b. In the User: INTEGRATE section, replace the two occurrences of INTEGRATE in the following string with the new default user name:
INTEGRATE identified by **INTEGRATE**
 - c. In the GRANT commands that follows the QUOTA commands in the User: INTEGRATE section, replace all occurrences of INTEGRATE with the new default user name.
 - d. Save the file.
7. Run the **ifw_Roles.sql** script.
This script creates the appropriate roles and the default user.
8. Log out and log in as *pipeline_user*.

9. Run the **ifw_Create.sql** script.

This script creates the Pipeline Manager framework tables.

10. Run the **ifw_Synonyms.sql** script.

This script creates the public synonyms.

The Oracle Pipeline Manager framework database schema is now set up.

You can create only one instance of the pipeline schema in a particular database. You can create multiple users and give permission to access the same tables. Creating multiple instances lead to public synonym conflict.

To avoid public synonym conflicts in a multiuser environment, change the public synonyms to private synonyms for specific users. See "[Changing Public Synonyms to Private for Users in Multiuser Environments](#)" for more information.

For example, if you create **table1** for **user1**, you can create **user2** and assign permissions to access **table1**. Typically, you access the table as **user1.table1**. However, using synonyms, you can directly access the table as **table1**. No prefix (**user1**) is required.

Changing Public Synonyms to Private for Users in Multiuser Environments

Changing public synonyms to private synonyms for a user is required for avoiding public synonym conflict in a multiuser environment.

Note: All scripts are located in the *Pipeline_Home/database/Oracle/Scripts* directory

To change public synonyms to private synonyms for a user:

1. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

where *databaseAlias* is the database alias of the Oracle database.

2. Drop the public synonyms for IFW tables for the user.

3. Grant CREATE ANY synonym access to the user you created for the Pipeline Manager tables. For example:

```
SQL>CREATE ROLE synonym_role;
SQL>GRANT CREATE ANY SYNONYM TO synonym_role;
SQL>GRANT synonym_role TO pin_user;
```

where *pin_user* is the BRM user.

4. Open the **ifw_Synonyms.sql** file with a text editor.

5. Remove the occurrences of the string **public** and add the Pipeline Manager database user. For example, for **ifw_SEQ_AGGREGATION** table, change the string to:

```
create synonym ifw_SEQ_AGGREGATION for ifw_user.ifw_SEQ_AGGREGATION;
```

where *ifw_user* is the is the Pipeline Manager database user.

6. Save the file.

7. Run the **ifw_Synonyms.sql** script.

This script creates the private synonyms for the user.

8. Exit SQL*Plus.

The public synonyms are now changed to private synonyms for the user.

Loading Procedures for FCT_DuplicateCheck

Before using the FCT_DuplicateCheck module, you must load the duplicate check stored procedures in the Pipeline Manager database:

1. Load the **DuplicateCheck_Oracle.plb** file from *Pipeline_home/database/Oracle/Scripts/DuplicateCheck*.
2. Verify that there is a unique index **BIDX_DUPCHK_DATA** on the **DATA** column of the **IFW_DUPLICATECHECK** table. If not, then create it before starting Pipeline Manager.

The duplicate check stored procedures are now loaded.

Encrypting the Database Password

If your database is encrypted with the MD5 format, use the **pin_crypt_upgrade** utility to migrate your data to the AES encryption scheme, and then use the **pin_crypt_app** utility to encrypt the Pipeline Manager password. For information about these utilities, see "pin_crypt_upgrade" and "pin_crypt_app" in *BRM Developer's Guide*.

For information on updating your encryption scheme, see "Migrating Data from MD5 to AES Encryption" in *BRM Developer's Guide*.

For information on encryption, see "About Encrypting Information" in *BRM Developer's Guide*.

1. Go to the *BRM_Home/bin* directory.
2. Run the **pin_crypt_app** utility with the **enc** parameter, and specify the plaintext password:

```
pin_crypt_app -enc Plaintext_password
```

The output is the AES tag followed by a vertical bar and the encrypted password. For example:

```
&aes|0D5E11BFDD97D2769D9B0DBFBD1BBF7EE03F1642861DFA57502C7FB85A654267
```

3. Write down the encrypted password or copy it to a text editor.
4. Open the Pipeline Manager startup registry file.
5. In the **DataPool** section, enter the user name, encrypted password, and database name.

For example:

```
UserName      = INTEGRATOR
Password      = &aes|0D5E11BFDD97D2769D9B0DBFBD1BBF7EE03F1642861DFA57502C7FB85A654267
DatabaseName  = IFWDB
```

Important: Be sure that these lines are not commented. (The default is commented.)

6. Save the registry file.

(Solaris) Configuring Memory Allocation and Block Transfer Mode on Solaris Systems

If you run Pipeline Manager on the Solaris platform, configure the following:

- [libumem Memory Allocator](#)
- [Block Transfer Mode](#)

libumem Memory Allocator

By default, the **Hoard** memory allocator is used on Solaris systems. If you run Pipeline Manager on Solaris 9, you might achieve better performance by using the **libumem** memory allocator.

To enable the **libumem** memory allocator, edit the **ifw-script** file (**ifw-start.sh** or **ifw-start.csh**, depending on your system needs) to set the **LD_PRELOAD_64** environment variable to **/usr/lib/sparcv9/libumem.so.1** and to change the executable from **ifw** to **ifw_nomalloc** as shown in the following examples:

For the **ifw-start.sh** file, change:

```
. /opt/ifw/source.me.sh
ifw $*
```

To the following:

```
export LD_PRELOAD_64=/usr/lib/sparcv9/libumem.so.1
. /opt/ifw/source.me.sh
ifw_nomalloc $*
```

For the **ifw-start.csh** file, change:

```
source /opt/ifw/source.me.csh
ifw $*
```

To the following:

```
setenv LD_PRELOAD_64=/usr/lib/sparcv9/libumem.so.1
source /opt/ifw/source.me.csh
ifw_nomalloc $*
```

Block Transfer Mode

On Solaris systems, you should set up Pipeline Manager buffers to function in block transfer mode. This mode addresses performance and scalability issues that occur when two or more threads are accessing the same buffer (thread contention).

When buffers operate in block transfer mode, EDR blocks of a configurable size are transferred simultaneously between the threads. If, for example, the block size is set to 100, concurrent buffer access is reduced to 1/100 of the number without the block transfer mode.

Specifying Block Transfer Mode and Block Size

To specify block transfer mode and block size, set the values in the registry files as shown in the following example:

Buffer

```
{
  Size = 4000
  BlockTransfer = TRUE      # Optional, defaults to FALSE
  BlockSize = 500          # Only needed when BlockTransfer = TRUE
}
```

This example specifies a buffer size of 4000 and a block size of 500. Up to eight (4000/500) blocks can be in the buffer.

Loading the Tailor-Made Stored Procedure

Loading of the stored procedure is required for the Tailor-Made Plan feature.

The following are the requirements to load the tailor-made stored procedure:

- BRM and Pipeline Manager should be installed.
- The BRM schema and the Pipeline Manager schema should reside on the same database.

To load the stored procedure, do the following:

1. Connect to the Oracle database with SQL*Plus:

```
% sqlplus system/manager@databaseAlias
```

2. Grant access of pipeline schema to user **pin** by doing the following:

- a. Run the SQL grant select, update, insert, delete commands on the Pipeline Manager tables.

For example, for the ifw_rateplan table, run the command:

```
SQL> grant select, update, insert, delete on ifw_rateplan to pin;
```

Run the command on the following tables:

- ifw_rateplan
- ifw_rateplan_cnf
- ifw_rateplan_ver
- ifw_model_selector
- ifw_selector_detail
- ifw_selector_rule
- ifw_selector_rule_lnk
- ifw_selector_ruleset
- ifw_pricemodel
- ifw_pricemdl_step

- b. Run the SQL grant select commands on the Pipeline Manager tables mentioned below.

For example, for the ifw_service table, run the command:

```
SQL> grant select on ifw_service to pin;
```

Run the command on the following tables:

- ifw_service

- ifw_timezone
 - ifw_timemodel
 - ifw_impact_cat
 - ifw_zonemodel
 - ifw_calendar
- c. Run the SQL grant select commands on the Pipeline Manager sequences. For example, for the ifw_seq_selectordetail sequence, run the command:
- ```
SQL> grant select ifw_seq_selectordetail to pin;
```
- Run the command on the following tables:
- ifw\_seq\_selectordetail
  - ifw\_seq\_selectorrule
  - ifw\_seq\_modelselector
  - ifw\_seq\_pricemodel
  - ifw\_seq\_rateplan
3. Type **exit** to exit SQL\*Plus.
4. Go to the **ifw/database/Oracle/Scripts** directory.
5. Enter this command to open SQL\*Plus:
- ```
sqlplus pin/pin@database_Name
```
- Where *database_Name* is the service name or database alias of the Oracle database.
6. Enter this command to load the stored procedure:
- ```
SQL>@create_pricing_tailormadeplan_procedures.plb
```
7. Type **exit** to exit SQL\*Plus.

## Loading the Discount Stored Procedure

Loading of the stored procedure is required for discount configuration.

The following are the requirements to load the discount stored procedure:

- BRM and Pipeline Manager should be installed.
- The BRM schema and the Pipeline Manager schema should reside on the same database.

To load the stored procedure, do the following:

1. Connect to the Oracle database with SQL\*Plus:

```
% sqlplus system/manager@databaseAlias
```
2. Grant access of pipeline schema to user **pin** by doing the following:
  - a. Run the SQL grant select, update, insert, delete commands on the Pipeline Manager tables.

For example, for the ifw\_discountmodel table, run the command:

```
SQL> grant select, update, insert, delete on ifw_discountmodel to pin;
```

Run the command on the following tables:

- ifw\_discountmodel
- ifw\_dscmdl\_ver
- ifw\_dscmdl\_cnf
- ifw\_dsctrigger
- ifw\_dscondition
- ifw\_disconrule
- ifw\_discountstep
- ifw\_dscbalimpact
- ifw\_discountmaster
- ifw\_discountdetail

- b. Run the SQL grant select commands on the Pipeline Manager sequences.  
For example, for the ifw\_seq\_discountmodel sequence, run the command:

```
SQL> grant select ifw_seq_discountmodel to pin;
```

Run the command on the following tables:

- ifw\_seq\_discountmodel
- ifw\_seq\_discountconfig
- ifw\_seq\_discounttrigger
- ifw\_seq\_discountcondition
- ifw\_seq\_disconrule
- ifw\_seq\_discountstep
- ifw\_seq\_discountbalimpact
- ifw\_seq\_discountmaster

3. Type **exit** to exit SQL\*Plus.
4. Go to the **ifw/database/Oracle/Scripts** directory.
5. Enter this command to open SQL\*Plus:

```
sqlplus pin/pin@database_Name
```

Where *database\_Name* is the service name or database alias of the Oracle database.

6. Enter this command to load the stored procedure:

```
SQL>@create_pricing_discountmodel_procedures.plb
```

7. Type **exit** to exit SQL\*Plus.

## What's Next?

To test your installation, you can use Pipeline Configuration Manager to configure pipelines and load sample data into the Pipeline Manager database. See "[About Pipeline Configuration Manager](#)".



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## About Pipeline Configuration Manager

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This chapter describes how to use Oracle Communications Billing and Revenue Management (BRM) Pipeline Configuration Manager to configure Pipeline Manager.

Before you read this chapter, read ["Installing Pipeline Manager"](#).

---

**Note:** To install Pipeline Configuration Manager, see ["Installing Pipeline Configuration Manager"](#).

---

### About Using Pipeline Configuration Manager

You can use Pipeline Configuration Manager to configure pipelines and load sample data into the Pipeline Manager database.

---

**Important:** Pipeline Configuration Manager is an optional feature that requires a separate license.

---

Pipeline Configuration Manager includes the **pin\_setup** utility and a set of configuration scripts. The **pin\_setup** utility:

- Configures the Pipeline Manager registry files.
- Creates Pipeline Manager database tables and loads sample data into them.
- Installs a set of scripts that you can use to execute various actions, such as starting and stopping a pipeline.

---

**Important:** One of the scripts (**01copypipelinefiles**) removes existing Pipeline Manager configuration files. You should back up your existing Pipeline Manager configuration files before running the **pin\_setup** utility.

---

---

**Note:** The **pin\_setup** utility creates a reorganized directory structure for the Pipeline Manager configuration files.

---

By default, the **pin\_setup** utility configures a standard set of pipelines that you can use to test your installation, but you can customize the way **pin\_setup** configures Pipeline Manager by configuring:

- The **pin\_setup.values** file.

See ["Setting Up Basic Configuration Data"](#).

- The setup scripts used by the **pin\_setup** utility.

See ["Specifying Script Execution Order"](#).

- The EDR container description file.
- Input and output mapping files.

---

---

**Note:** For the default Pipeline Manager configuration created by the **pin\_setup** utility, see ["About the Default Pipeline Manager Configuration"](#).

---

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**Important:** When you upgrade, you must manually merge your customizations with the new versions of these files. Upgrading is easier if you keep a record of the changes you make to the files.

---

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---

**Tip:** You can create scripts to implement your customizations, which can be run during an upgrade.

---

---

After you run the **pin\_setup** utility, you can further customize your Pipeline Manager configuration. In most cases, you do not need to. You should make as many customizations as possible to the configuration scripts and files so the configuration can be easily copied to another system.

## Using Pipeline Configuration Manager to Configure Pipeline Manager

To configure Pipeline Manager by using the **pin\_setup** utility, follow the procedures in these sections:

1. [Setting Up Basic Configuration Data](#)
2. [\(Optional\) Customizing the Setup Scripts](#)
3. [Running the pin\\_setup Utility](#)

## Setting Up Basic Configuration Data

To set up basic configuration data, you edit the **pin\_setup.values** file. This file specifies basic configuration values, such as database names and passwords, and specifies the location and execution order of the subscripts that the **pin\_setup** utility calls.

To edit the **pin\_setup.values** file:

1. Open the file in a text editor. The file is located in *Pipeline\_home/setup*.
2. Edit the file.

[Table 19-1](#) shows the entries in the **pin\_setup.values** file:

**Table 19–1 Entries in `pin_setup.values`**

| Entry                | Description                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>InstallDir</b>    | The directory where you installed Pipeline Manager and Pipeline Configuration Manager.                                                                                                                                                                                                                                                                                                      |
| <b>MasterDir</b>     | The top level directory where the <b>pin_setup</b> utility copies the configured files ( <i>Pipeline_home</i> ).                                                                                                                                                                                                                                                                            |
| <b>StepDirs</b>      | <p>The directories that contain the scripts run by the <b>pin_setup</b> utility. The format includes the directory names separated by commas:</p> <p><b>StepDirs = Dir1, Dir2, Dir3</b></p> <p>You can add directories that include your custom scripts.</p> <p>Do not remove the entries for the standard directories.</p> <p>See <a href="#">"Specifying Script Execution Order"</a>.</p> |
| <b>PLDBSid</b>       | The SID of the Pipeline Manager database.                                                                                                                                                                                                                                                                                                                                                   |
| <b>PLDBUserId</b>    | The user ID of the Pipeline Manager database.                                                                                                                                                                                                                                                                                                                                               |
| <b>PLDBPasswd</b>    | The password of the Pipeline Manager database.                                                                                                                                                                                                                                                                                                                                              |
| <b>JSDBUserId</b>    | The user ID of the JSA database.                                                                                                                                                                                                                                                                                                                                                            |
| <b>JSDBPasswd</b>    | The password of the JSA database.                                                                                                                                                                                                                                                                                                                                                           |
| <b>InfraDBUserId</b> | <p>The user ID of the BRM database.</p> <p>This is the user ID specified in the BRM Oracle Data Manager (DM) <b>pin.conf</b> file; for example:</p> <p>- dm_sm_id PIN_DB_ID</p>                                                                                                                                                                                                             |
| <b>InfraDBPasswd</b> | <p>The password of the BRM database.</p> <p>This is the password specified in the BRM Oracle DM <b>pin.conf</b> file; for example:</p> <p>- dm_sm_pw PIN_DB_PW</p>                                                                                                                                                                                                                          |
| <b>InfraDBSID</b>    | <p>The SID of the BRM database.</p> <p>This is the database specified in the BRM Oracle DM <b>pin.conf</b> file; for example:</p> <p>- dm_sm_database PIN_DB_SID</p>                                                                                                                                                                                                                        |
| <b>QuDBUserId</b>    | <p>The user ID of the Oracle queues.</p> <p>This is the user ID specified in the Account Synchronization DM (dm_ifw_sync) <b>pin.conf</b> file; for example:</p> <p>- dm_ifw_sync sm_id PIN_DB_ID</p>                                                                                                                                                                                       |
| <b>QuDBPasswd</b>    | <p>The password of the Oracle queues.</p> <p>This is the password specified in the Account Synchronization DM (dm_ifw_sync) <b>pin.conf</b> file; for example:</p> <p>- dm_ifw_sync sm_pw PIN_DB_PW</p>                                                                                                                                                                                     |
| <b>QuDBSID</b>       | <p>The SID of the Oracle queues.</p> <p>This is the database specified in the Account Synchronization DM (dm_ifw_sync) <b>pin.conf</b> file; for example:</p> <p>- dm_ifw_sync sm_database PIN_DB_SID</p>                                                                                                                                                                                   |
| <b>QName</b>         | <p>The name of the queue.</p> <p>This is the queue specified in the Account Synchronization DM (dm_ifw_sync) <b>ifw_sync_queueName</b> file; for example:</p> <p>QName=IFW_SYNC_QUEUE</p>                                                                                                                                                                                                   |
| <b>SystemPasswd</b>  | The password for the system user ID on the Oracle server.                                                                                                                                                                                                                                                                                                                                   |

**Table 19–1 (Cont.) Entries in `pin_setup.values`**

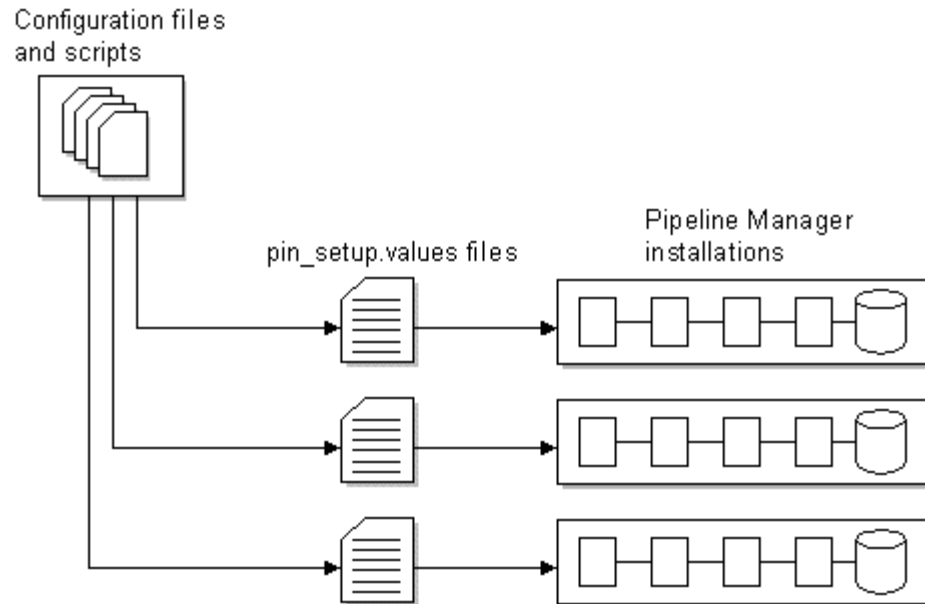
| Entry                       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DatafilePath</b>         | The path to the directory where Pipeline Manager data files are created ( <code>/data</code> ).                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>DBLibrary</b>            | The database library; for example:<br><code>DBLibrary=or952</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>port</b>                 | The TCP/IP port number to be use for the wireless registry ( <code>ifw.DataPool.RealtimePipeline.Module.ThreadPool</code> section of <code>wirelessRealtime.reg</code> ). This is the port to be used by the Connection Manager (CM)'s <code>pin.conf</code> <code>em_pointer</code> entry; for example:<br><code>port=1234</code>                                                                                                                                                                                                     |
| <b>UnixSockFile</b>         | The UNIX socket file to use for the wireless registry ( <code>ifw.DataPool.RealtimePipeline.Module.ThreadPool</code> section of <code>wirelessRealtime.reg</code> ).                                                                                                                                                                                                                                                                                                                                                                   |
| <b>DiscountOpcodeMapXml</b> | The custom XML file that maps the input flist fields to EDR container fields. The <code>pin_setup</code> utility uses this value when it creates the OpcodeMapping entry of the DiscountPipeline section in the <code>wirelessRealtime.reg</code> registry file.<br><br>If this parameter is not specified, the <code>pin_setup</code> utility adds the following entry to the DiscountPipeline section of <code>wirelessRealtime.reg</code> :<br><code>OpcodeMapping = ./formatDesc/Formats/Realtime/discount_event.xml</code>        |
| <b>GSMOpcodeMapXml</b>      | The custom XML file that maps the input flist fields to EDR container fields. The <code>pin_setup</code> utility uses this value when it creates the OpcodeMapping entry of the RealtimePipelineGSM section in the <code>wirelessRealtime.reg</code> registry file.<br><br>If this parameter is not specified, the <code>pin_setup</code> utility adds the following entry to the RealtimePipelineGSM section of <code>wirelessRealtime.reg</code> :<br><code>OpcodeMapping = ./formatDesc/Formats/Realtime/rate_event.xml</code>      |
| <b>GPRSOpcodeMapXml</b>     | The custom XML file that maps the input flist fields to EDR container fields. The <code>pin_setup</code> utility uses this value when it creates the OpcodeMapping entry of the RealtimePipelineGPRS section in the <code>wirelessRealtime.reg</code> registry file.<br><br>If this parameter is not specified, the <code>pin_setup</code> utility adds the following entry to the RealtimePipelineGPRS section of <code>wirelessRealtime.reg</code> :<br><code>OpcodeMapping = ./formatDesc/Formats/Realtime/rate_event.xml</code>    |
| <b>ZoneOpcodeMapXml</b>     | The custom XML file that maps the input flist fields to EDR container fields. The <code>pin_setup</code> utility uses this value when it creates the OpcodeMapping entry of the RealtimePipelineZone section in the <code>wirelessRealtime.reg</code> registry file.<br><br>If this parameter is not specified, the <code>pin_setup</code> utility adds the following entry to the RealtimePipelineZone section of <code>wirelessRealtime.reg</code> :<br><code>OpcodeMapping = ./formatDesc/Formats/Realtime/zonemap_event.xml</code> |
| <b>InpMappingScript</b>     | The output mapping script ( <code>.isc</code> ) file to use for the wireless registry ( <code>ifw.DataPool.RealtimePipeline.Module.ThreadPool</code> section of <code>wirelessRealtime.reg</code> ); for example:<br><code>InpMappingScript = ./iScriptLib/iScriptLib_Standard/ISC_InMap.isc</code>                                                                                                                                                                                                                                    |
| <b>OutMappingScript</b>     | The output mapping script ( <code>.isc</code> ) file to use for the <code>ifw.DataPool.RealtimePipeline.Module.ThreadPool</code> section of the <code>wirelessRealtime.reg</code> file; for example:<br><code>OutMappingScript= ./iScriptLib/iScriptLib_Standard/ISC_OutMap.isc</code>                                                                                                                                                                                                                                                 |
| <b>SystemPasswd</b>         | The system password for the system user ID of the database:<br><code>SystemPasswd = system_password</code>                                                                                                                                                                                                                                                                                                                                                                                                                             |

### 3. Save and close the file.

## Creating Multiple Test Installations

You can use Pipeline Configuration Manager to create multiple test installations using the same configuration. To do so, install Pipeline Configuration Manager in one location. Then use multiple **pin\_setup.values** files to specify different target installation systems, as shown in [Figure 19–1](#).

**Figure 19–1 Configuration Files and Scripts**



## (Optional) Customizing the Setup Scripts

Pipeline Configuration Manager includes a set of scripts (called *steps*) that are run by the **pin\_setup** utility in alphabetical order.

You can customize these scripts; for example, by adding modules to the registry. You can also choose whether to run the default scripts or add custom scripts.

[Table 19–2](#) shows the default scripts that the **pin\_setup** utility runs:

**Table 19–2 Scripts Run by pin\_setup**

| Script (In the Setup Directory) | Description                                                                                                                                                                                                                                                                                     |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>01coppipelinefiles</b>       | Deletes the existing Pipeline Manager directory and then copies the configuration files to the <i>Pipeline_home</i> directory.<br><b>Important:</b> This script removes existing files. Back up your existing Pipeline Manager configuration files before running the <b>pin_setup</b> utility. |
| <b>02createconf</b>             | Adds directories and copies files.                                                                                                                                                                                                                                                              |
| <b>04regsetup</b>               | Updates the <b>wireless.reg</b> registry file with installation-specific data, such as database names and passwords.                                                                                                                                                                            |
| <b>07realtimeRegSetup</b>       | Updates the <b>wirelessRealtime.reg</b> registry file with communication configuration data, including a port number, socket file, and input and output description files to use for wireless data.                                                                                             |
| <b>08genTestReg.pl</b>          | Creates a debug registry file. This registry file specifies to insert EDR dumps after every function module and enables the <b>LogEvents</b> parameter.                                                                                                                                         |

**Table 19–2 (Cont.) Scripts Run by `pin_setup`**

| Script (In the Setup Directory) | Description                                                                                                                                                                                                                                                    |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>12insertpasswd</b>           | Changes the default password in some default SQL scripts.                                                                                                                                                                                                      |
| <b>16dbinit</b>                 | Creates SQL files with updated database information. Subsequent scripts use these SQL files.                                                                                                                                                                   |
| <b>20dbcreate</b>               | Runs the SQL files created by the previous script ( <b>16dbinit</b> ) to create the JSA and Pipeline Manager database users and tablespaces.                                                                                                                   |
| <b>24jsacreate</b>              | Creates the JSA database tables, indexes, and synonyms.                                                                                                                                                                                                        |
| <b>28pipelinecreate</b>         | Creates the Pipeline Manager database tables, indexes, sequences, and synonyms.                                                                                                                                                                                |
| <b>32DBLoad</b>                 | Loads the sample data into the Pipeline Manager database.                                                                                                                                                                                                      |
| <b>40xmlconfig</b>              | Updates the <b>LoadIfwConfig.reg</b> registry file with communication configuration data including the XML Schema file. This file is used by the <b>LoadIfwConfig</b> utility. See "LoadIfwConfig" in <i>BRM Configuring Pipeline Rating and Discounting</i> . |

## Specifying Script Execution Order

The setup scripts are located in subdirectories of the **steps** directory. You specify which sets of scripts are run by using the `StepDirs` parameter in the **pin\_setup.values** file, as in this example:

```
StepDirs = Setup,Oracle
```

To run the scripts, the **pin\_setup** utility collates scripts from all subdirectories into a single list, and runs the scripts in alphabetical order. You can specify the order in which the scripts run by renaming the script files.

To make script execution order easier to specify and maintain, rename the script files by adding 2-digit numbers to the front of the file names.

For example, if your installation uses the following directories and scripts:

- **Oracle** directory
  - **12insertpasswd**
  - **16dbinit**
  - **20dbcreate**
  - **24jsacreate**
  - **28pipelinecreate**
  - **32DBLoad**
- **Setup** directory
  - **01copypipelinefiles**
  - **02source.pl**
  - **04regsetup**
  - **06regsetupRerating**
  - **07realtimeRegSetup**
  - **08genTestReg.pl**
  - **40xmlconfig**

If `StepDirs` = **Setup,Oracle** the scripts are run in this order:

1. 01copypipelinefiles
2. 02source.pl
3. 04regsetup
4. 06regsetupRerating
5. 07realtimeRegSetup
6. 08genTestReg.pl
7. 12insertpasswd
8. 16dbinit
9. 20dbcreate
10. 24jsacreate
11. 28pipelinecreate
12. 32DBLoad
13. 40xmlconfig

You can add your own directories. If you do not want to run a script, remove the directory name from the **StepDirs** parameter.

## Running the `pin_setup` Utility

---

**Important:** Before running the `pin_setup` utility, customize the setup files and edit the `pin_setup.values` file. See ["Setting Up Basic Configuration Data"](#) and ["\(Optional\) Customizing the Setup Scripts"](#).

---

By default, the `pin_setup` utility runs all of the scripts in the directories specified in the **StepDirs** parameter in the `pin_setup.values` file. See ["Specifying Script Execution Order"](#). You can also do the following:

- Use the **-recover\_last** parameter to restart the configuration if it was stopped. The configuration begins where it stopped.

---

**Important:** This parameter recovers from the last point of failure. It does not roll back the changes made by the successful steps.

---

- Use the **-runone** parameter to run the files from a single script directory.

For information on running the utility, see ["pin\\_setup"](#).

---

**Note:** The `pin_setup` utility configures the configuration file used by the `LoadIfwConfig` utility (`LoadIfwConfig.reg`). See ["LoadIfwConfig"](#) in *BRM Configuring Pipeline Rating and Discounting*.

---

## About the Default Pipeline Manager Configuration

By default, the `pin_setup` utility runs scripts that configure the following pipelines:

- A rating pipeline
- A backout pipeline for rerating
- A rerating pipeline

The configuration includes the input and output formats and the BRM EDR container format. The pipelines can rate CDRs for the following services:

- GSM (Voice, data, fax, and SMS)
- GPRS

The configuration supports extended rating attributes (ERAs).

## Default Data Modules

The following data modules are configured by default:

---

---

**Note:** Some modules might be configured disabled by default. Check the registry file entry for each module.

---

---

- Database Connect (DBC)
- DAT\_Listener
- DAT\_AccountBatch
- DAT\_AccountRealtime
- DAT\_Zone
- DAT\_PrefixDesc
- DAT\_Calendar
- DAT\_Rateplan
- DAT\_PriceModel
- DAT\_TimeModel
- DAT\_ExchangeRate
- DAT\_Dayrate
- DAT\_Discount
- DAT\_ScenarioReader
- DAT\_Currency
- DAT\_USC\_Mapin

For information about these data modules, see "Pipeline Manager Data Modules" in *BRM Configuring Pipeline Rating and Discounting*.

## Default Function Modules

The following function modules are configured by default:

- FCT\_PreRecycle
- FCT\_ServiceCodeMap
- FCT\_UsageClassMap



- FCT\_Discard
- FCT\_DuplicateCheck
- FCT\_CallAssembling
- FCT\_PrefixDesc
- FCT\_Account
- FCT\_CustomerRating
- FCT\_PreRating
- FCT\_IRules
- FCT\_APN\_Map
- FCT\_USC\_Map
- FCT\_RSC\_Map
- FCT\_MainRating
- FCT\_Dayrate
- FCT\_RateAdjust
- FCT\_DiscountAnalysis
- FCT\_Discount
- FCT\_BillingRecord
- FCT\_AggreGate
- FCT\_Reject
- FCT\_Recycle

For information about these function modules, see "Pipeline Manager Function Modules" in *BRM Configuring Pipeline Rating and Discounting*.

## Default Database Tables

The **pin\_setup** utility creates all of the Pipeline Manager tables in the Pipeline Manager database. Some are populated with default data.

## What's Next?

See ["Testing Pipeline Manager"](#) for more information.



---

## Testing Pipeline Manager

This chapter describes basic start, stop, and configuration tests for Oracle Communications Billing and Revenue Management (BRM) Pipeline Manager.

### About Testing Pipeline Manager

To test Pipeline Manager, follow the procedures in these sections:

---

**Note:** To perform a test start and stop of the Pipeline Manager database, contact your database administrator.

---

1. [Starting Pipeline Manager](#)
2. [Using Pipeline Configuration Manager to Configure Pipeline Manager](#)
3. [Testing Pipeline Manager without a Database Connection](#)
4. [Testing Pipeline Manager with a Database Connection](#)
5. [Testing Single and Multiple Pipeline Rating with BRM](#)

---

**Important:** After testing basic pipeline operation, see "Configuring Pipeline Manager" and "Optimizing Pipeline Manager Performance" in *BRM System Administrator's Guide* for more information on configuration and tuning.

---

### Starting Pipeline Manager

You start Pipeline Manager by using one of the following methods:

- The **pin\_ctl** utility. See "Starting a Component by Using the pin\_ctl Utility" in *BRM System Administrator's Guide*.
- The **ifw** command from the *Pipeline\_home* directory:

```
% Pipeline_home/bin/ifw -r RegistryFile
```

where *RegistryFile* is your registry file name.

---

**Important:** When Pipeline Manager cannot establish a connection with the Pipeline Manager database (most likely because the database is down), you receive an error message and the Pipeline Manager startup is canceled.

---

For more information on parameters used with the **ifw** command, see "Starting and Stopping Pipeline Manager Manually" in *BRM System Administrator's Guide*.

If there are startup issues, the system stops and sends notifications to the process log and **stdout**.

---

**Note:** The path and file name of the process log are defined in the **ProcessLog** section of the startup registry.

---

## Stopping Pipeline Manager

You stop Pipeline Manager by using the **pin\_ctl** utility, or a semaphore. See "Starting and Stopping the BRM System" and "Starting and Stopping Pipeline Manager Manually" in *BRM System Administrator's Guide*.

## Testing Pipeline Manager without a Database Connection

To test Pipeline Manager *without* database access:

1. Go to the **system** directory.
2. Source the **source.me.sh** for the shell:

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

---

**Note:** The **source.me.sh** is for a bash shell. If you use a C shell, enter **source.me.csh**.

---

3. Go to the *Pipeline\_home* directory.
4. Start Pipeline Manager with the **simple.reg** registry file:

```
bin/ifw -r Pipeline_home/samples/simple/simple.reg
```

The system starts without a database connection and two sample EDR files are processed.

5. To confirm that the sample EDR files are processed, go to the *Pipeline\_home/samples/simple/data/out* directory and open the output file.
6. If an error occurs:
  - An output reject file is created in the *Pipeline\_home/samples/simple/data/rej* directory.
  - The input file is moved to the **err** directory. You can find it in the *Pipeline\_home/samples/simple/data/err* directory.
7. Stop Pipeline Manager. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

## Testing Pipeline Manager with a Database Connection

To test Pipeline Manager *with* database access:

1. Go to the **system** directory.
2. Source the **source.me.sh** for the shell:

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

---

**Note:** The **source.me.sh** is for a bash shell. If you use a C shell, enter **source.me.csh**.

---

3. Open the *Pipeline\_home/samples/simple/simple.reg* file by using a text editor such as **vi**.
4. In the **ifw.DataPool.PrefixDescData** section:
  - Comment out the **Source** parameter entry with the **File** value and uncomment the entry with the **Database** value.
  - Be sure that the **DataConnection** parameter is set to **ifw.Datapool.Login**.
5. Be sure that the DBC module is configured with values for the **UserName**, **PassWord**, and **DataBaseName** parameters.  
See "Database Connect (DBC)" in *BRM Configuring Pipeline Rating and Discounting*.
6. Save the file.
7. Start Pipeline Manager with the **simple.reg** registry file.  

```
bin/ifw -r Pipeline_home/samples/simple/simple.reg
```
8. If you previously tested Pipeline Manager without a database connection, move the done EDR files from the */samples/simple/data/done* directory to the */samples/simple/data/out* directory and rename the file to **\*edr**.  
The system is running without a database connection; and it processes two sample EDR files.
9. To confirm that the sample EDR files are processed, go to the *Pipeline\_home/samples/simple/data/out* directory and open the output file.
10. If an error occurs:
  - An output reject file is created in the *Pipeline\_home/samples/simple/data/rej* directory.
  - The input file is moved to the **err** directory.  
You can find it in the *Pipeline\_home/samples/simple/data/err* directory.
11. Stop Pipeline Manager.  
See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

## Testing Single and Multiple Pipeline Rating with BRM

This test uses the whole range of Pipeline Manager functions. To perform a **wireless** test run:

---

**Important:** All steps in this section are required. This procedure uses a sample wireless price plan, pipeline registry file, and CDR. For your implementation, you must perform these steps using either your custom price plan and registry file or the samples.

---

1. Go to the **system** directory.
2. Source the **source.me.sh** for the shell:

**source.me.sh**

---

---

**Note:** The **source.me.sh** is for a bash shell. If you use a C shell, enter **source.me.csh**.

---

---

3. Run the *Pipeline\_home/conf/pricingdata/Oracle/insertWIRELESS\_SAMPLE.pl* script.

**insertWIRELESS\_SAMPLE.pl**

This script loads the sample wireless price plan configuration into your Pipeline Manager database.

---

---

**Note:** If you ran this script in a previous test, you do not have to run it again.

---

---

4. Open a sample wireless registry file.

For single pipeline testing: *Pipeline\_home/conf/wireless.reg*.

---

---

**Tip:** To isolate potential problems, perform a single pipeline test first.

---

---

5. Be sure that the DBC module is configured with values for the **UserName**, **PassWord**, and **DataBaseName** parameters.

See Database Connect (DBC) in *BRM Configuring Pipeline Rating and Discounting*.

6. Start Pipeline Manager.

For single pipeline testing, use the **wireless.reg** registry file:

**bin/ifw -r conf/wireless.reg**

7. Create sample CDRs.

See "[Creating a Sample CDR File](#)".

---

---

**Important:** Use the file naming format **teststring.edr**, where *string* is any string. The CDRs must match your BRM data (service, origin, timestamps).

---

---

8. Stop Pipeline Manager.

See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

## Creating a Sample CDR File

Your sample CDR must be formatted using:

- Plain ASCII
- Semi-colon-separated
- One record per line

All lines, including the last record, must end with a NL (new line) character.

**Example 20–1 Sample Format:**

*service-code;a-number;b-number;start-time;duration;vol-sent;vol-recieved;callclass;cell-id;apn*

Table 20–1 describes CDR field formats and restrictions:

**Table 20–1 CDR Field Formats**

| Field                       | Description and Format                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>service-code</i>         | <p>The service code.</p> <p>Maximum length: 3 characters.</p> <p>The following service code values are predefined in the sample rate plan:</p> <ul style="list-style-type: none"> <li>▪ <b>TEL</b></li> <li>▪ <b>GPR</b></li> <li>▪ <b>SMS</b></li> <li>▪ <b>WAP</b></li> <li>▪ <b>DAT</b></li> <li>▪ <b>FAX</b></li> </ul>                                                                                  |
| <i>a-number</i>             | <p>The call's originating number.</p> <p>Maximum length: 40 characters.</p> <p>Sample value: <b>0049172918333</b></p>                                                                                                                                                                                                                                                                                        |
| <i>b-number</i>             | <p>The call's target number.</p> <p>Maximum length: 40 characters.</p> <p>Sample value: <b>004941067600</b></p>                                                                                                                                                                                                                                                                                              |
| <i>start-time</i>           | <p>The call start time.</p> <p>Format: YYYYMMDDHHMISS</p> <p>Sample values: <b>20011114184510</b> (for '14.11.2001 18:45:10')</p>                                                                                                                                                                                                                                                                            |
| <i>duration</i>             | <p>The call duration in seconds.</p> <p>Maximum length: 11 digits.</p> <p>Sample value: <b>300</b> (for 5 minutes)</p>                                                                                                                                                                                                                                                                                       |
| <i>vol-sent</i>             | <p>The number of bytes sent in the call.</p> <p>Maximum length: 11 digits.</p> <p>Sample value: <b>(1024</b> for 1 KB)</p>                                                                                                                                                                                                                                                                                   |
| <i>vol-received</i>         | <p>The number of bytes received in the call.</p> <p>Maximum length: 11 digits.</p> <p>Sample value: <b>(1024</b> for 1 KB)</p>                                                                                                                                                                                                                                                                               |
| (Optional) <i>callclass</i> | <p>The class of call.</p> <p>Maximum length: 5 characters.</p> <p>The following call class values are predefined in the sample rate plan:</p> <ul style="list-style-type: none"> <li>▪ <b>Conf</b> = Conference Call</li> <li>▪ <b>Mail</b> = Mailbox Inquiry</li> <li>▪ <b>MOC</b> = Mobile-Originated Call (Outgoing Roaming)</li> <li>▪ <b>MTC</b> = Mobile-Terminated Call (Incoming Roaming)</li> </ul> |
| <i>apn</i>                  | <p>The access point name for the call.</p> <p>Maximum length: 64 characters.</p> <p>Sample use: specifying the URL for GPRS</p>                                                                                                                                                                                                                                                                              |

### Example 20–2 Sample CDR Records

```
TEL;00491729183333;004941067600;20011114184510;300;0;0;;;
TEL;00491729183333;004941067600;20011114184510;300;0;0;Mail;47113;
TEL;00491729183333;004941067600;20011114184510;300;0;0;Conf;98765;
TEL;00491729183333;004941067600;20011114184510;300;0;0;MOC;238476;
TEL;00491732410;004941067600;20011114184300;300;0;0;NORM;123456;
TEL;00491732411;004941067600;20011114184300;270;0;0;NORM;123456;
TEL;00491732412;004941067600;20011114184300;110;0;0;NORM;123456;
DAT;00491732413;004941067600;20011114184300;50;0;0;NORM;123456;
FAX;00491732414;004941067600;20011114184300;12;0;0;NORM;123456;
TEL;00491732415;004941067600;20011114184300;1;0;0;NORM;123456;
SMS;00491732416;004941067600;20011114184300;63;0;0;NORM;123456;
TEL;00491732417;004941067600;20011114184300;37;0;0;NORM;123456;
TEL;00491732418;004941067600;20011114184300;132;0;0;NORM;123456;
TEL;00491732419;004941067600;20011114184300;60;0;0;NORM;123456;
GPR;00491732410;0049;20011114184510;300;78965;5054;;001121;hamburg.portal.com
```

## Troubleshooting

If you cannot start Pipeline Manager, it can be due to the following problems or errors:

---

---

**Note:** Error messages are written into the process log file and into the pipeline log files. For more information on pipeline log files, see "About Pipeline Manager Log Files" in *BRM System Administrator's Guide*.

---

---

- **The user environment is not set correctly.**

Solution: Correct the errors in the environment settings.

- **The registry contains errors.**

Solution: Check the registry for type errors, missing brackets, missing or incorrect entries, and so on.

---

---

**Note:** Registry entries are case-sensitive.

---

---

- **Paths are missing.**

Solution: Create the missing paths according to the definition in the startup registry.

- **A lock file already exists.**

Solution: If the BRM framework has not been stopped correctly, a lock file already exists. Delete the lock file and then stop and restart Pipeline Manager framework.

- **The database is not opened/the listener has not been started.**

Solution: Open the database and start the listener.

- **The database entries contain errors.**

Solution: Check the created database schemes.



# Part IV

---

## Installing Account Synchronization

Part IV describes how to install the Oracle Communications Billing and Revenue Management (BRM) Account Synchronization feature. It contains the following chapters:

- [About Sending Account Data to Pipeline Manager](#)
- [Installing and Configuring Account Synchronization](#)
- [Account Synchronization Installation Utilities](#)



---

## About Sending Account Data to Pipeline Manager

This chapter describes Oracle Communications Billing and Revenue Management (BRM) Account Synchronization Manager and how account synchronization works. Anyone who installs, configures, or administers Account Synchronization Manager should read this document.

Before installing Account Synchronization Manager, you should be familiar with how a BRM wireless system works. See the following sections in *BRM Telco Integration*:

- About Integrating Wireless Services
- Overview of BRM Wireless Services Installation

### About Account Synchronization

Account Synchronization Manager synchronizes customer and service data with pipeline rating data.

Account Synchronization Manager enables Pipeline Manager to act on events that occur in BRM based on the event type. For example, when account information changes, such as when products are purchased or account status is changed, the account information must be updated in the Pipeline Manager database so that service usage events can be rated properly. The Account Synchronization DM sends the updated account information to Pipeline Manager, enabling Pipeline Manager to rate events using the updated information.

You set up the following modules to receive events through account synchronization:

- **DAT\_Listener:** All events are retrieved by this module first. This module passes the events to the other modules that are set up to receive them.
- **DAT\_AccountBatch:** This module receives account update information to ensure that Pipeline Manager uses the most current account information when rating events.
- **DAT\_BalanceBatch:** This module receives balance update information to ensure that Pipeline Manager uses the most current balance information when rating events.
- **DAT\_Discount:** This module receives discount balance update information to ensure that Pipeline Manager uses the most current discount balance configuration when rating events.

## How Account Synchronization Works

The Account Synchronization DM notifies Pipeline Manager when certain account information changes (for example, when a customer service representative (CSR) adds, cancels, or modifies an account or when an adjustment such as a cycle fee is applied to an account balance). The Account Synchronization DM sends information about updates through a database queue, and Pipeline Manager retrieves the information from the queue. For more information about the queue, see "[About the Database Queues](#)".

---

---

**Note:** When an account is created, the Account Synchronization DM notifies Pipeline Manager about the new account, but the account details (such as the account's products, discounts, and other account information) are not loaded into Pipeline Manager memory until the first call data record (CDR) is rated for the account. This is because Pipeline Manager does not require the account details until the account has some usage that must be rated.

---

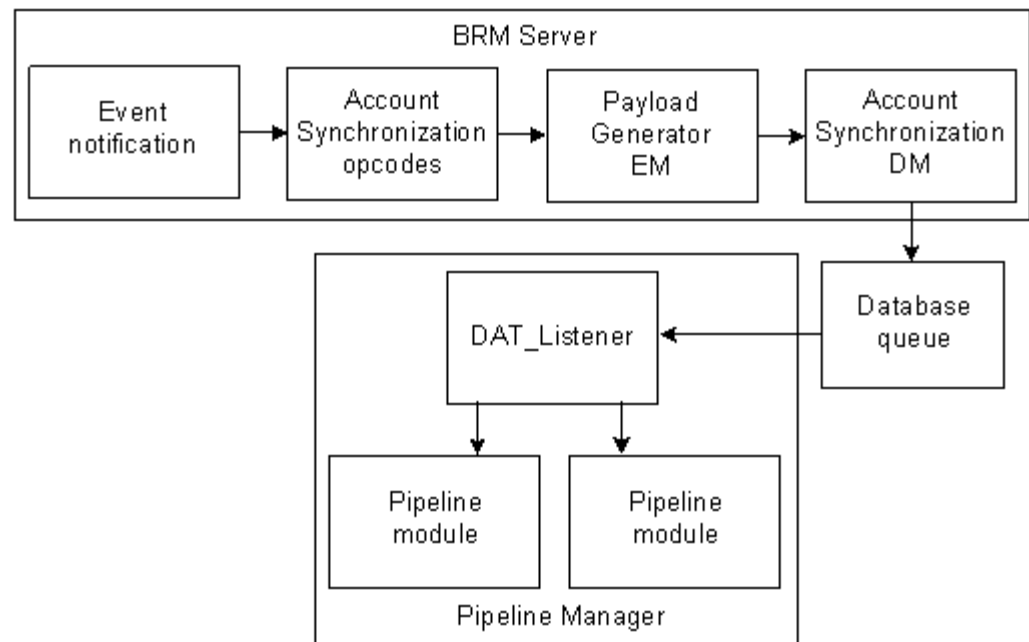
---

The Account Synchronization DM can send any event data to Pipeline Manager that it is configured to send. Pipeline modules register to receive events through the DAT\_Listener module. When a module receives a business event, it can either use the enqueued event data for processing or access the BRM database for the most current data.

All business events sent to Pipeline Manager are stored in the database queue. If Pipeline Manager terminates, the Account Synchronization DM continues to send events to the queue. When Pipeline Manager is restarted, it retrieves the events from the queue. Likewise, if Account Synchronization Manager terminates, Pipeline Manager continues to retrieve events already in the queue.

If billing is being run while Pipeline Manager is starting, events are queued while the DAT modules are being initialized. Events are not processed until the DAT models are ready.

[Figure 21-1](#) shows the data flow from event notification to Pipeline Manager update:

**Figure 21–1 Data Flow from Event Notification to Pipeline Manager**

The following actions take place when account synchronization is performed:

1. An event listed in the Account Synchronization event notification list (**pin\_notify\_ifw\_sync**) is generated, triggering a call to the opcode associated with that event in the list. See "About Event Notification" in *BRM Developer's Guide*.
2. One of the following actions occurs:
  - If the event is associated with the PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT opcode, it is passed to the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode for modification. The policy opcode passes the event, along with any modifications, to the Payload Generator External Module (EM).  
See ["About the Account Synchronization Opcodes"](#).
  - If the event is *not* associated with PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT, it is sent directly to the Payload Generator EM.
3. The Payload Generator EM collects events in its payload until they compose a complete business event.  
See ["About the EAI Framework"](#).
4. When the business event is complete, the Payload Generator EM sends it to the Account Synchronization DM.  
See ["About the Account Synchronization DM"](#).
5. The Account Synchronization DM sends the business event to a database queue.  
See ["About the Database Queues"](#).
6. DAT\_Listener retrieves the business event from the database queue and sends the event to pipeline modules that are registered for that event.  
See ["About the DAT\\_Listener Module"](#).
7. The module uses the event as needed.

## About the EAI Framework

The Account Synchronization DM works with the Enterprise Application Integration (EAI) framework. You use the EAI framework to define business events for account synchronization, capture the BRM events that make up the business events, and send the completed business events to the Account Synchronization DM.

The Account Synchronization EAI framework consists of the following components:

- BRM event notification

The Account Synchronization event notification list (**pin\_notify\_ifw\_sync**) contains all the BRM events that make up the business events defined in the Account Synchronization payload configuration file (**payloadconfig\_ifw\_sync.xml**). In the list, each event is associated with an opcode. When a listed event is generated, its associated opcode is called to pass the event to the Payload Generator EM. See "About Event Notification" in *BRM Developer's Guide* and "[Configuring Event Notification for Account Synchronization](#)".

- The Payload Generator EM

This module notifies the Account Synchronization DM when a business event occurs that requires some action such as an account update. Default business events for account synchronization are defined in the payload configuration file. See "[Configuring the EAI Payload for Account Synchronization](#)".

The **payloadconfig\_ifw\_sync.xml** file includes a set of default business events. If you create custom business events, use the DAT\_BalanceBatch **CustomEvents** registry entry to enable Pipeline Manager to be notified of those events. For information on creating business events, see "Defining Business Events" in *BRM Developer's Guide*.

The Payload Generator EM notifies the Account Synchronization DM when business events, such as account creation, product purchase, account status change, and account balance adjustment occur. As soon as the Payload Generator EM collects all the BRM events that belong to a specific business event, it sends the business event payload to the Account Synchronization DM.

Although the Account Synchronization DM relies on the EAI framework, you do not need to install EAI Manager separately. All necessary EAI files are included with Account Synchronization Manager.

For information about using the Payload Generator EM and the payload configuration file, see the following EAI Manager topics in *BRM Developer's Guide*:

- About BRM Business Events
- About Publishing Additional Business Events
- About the Payload Configuration File Syntax

## About the Account Synchronization Opcodes

Account synchronization uses a set of opcodes to modify the content of certain BRM events that make up business events before the business events are sent to the Account Synchronization DM.

To enable this, the BRM events are associated with the PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT opcode in your system's event notification list. When these BRM events occur, PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT is called to pass them to the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode for processing.

You can use the policy opcode to customize certain aspects of the BRM events based on your business needs. See ["Modifying Business Events before Sending Them to Pipeline Manager"](#).

After the Account Synchronization opcodes process the BRM events, they pass them to the EAI framework publishing opcode, which compiles them into business events to publish to Pipeline Manager.

---

**Tip:** Not all BRM events that make up Account Synchronization business events must be passed through the Account Synchronization opcodes. If you do not need to customize the BRM events, associate them with the EAI framework publishing opcode, PCM\_OP\_PUBLISH\_GEN\_PAYLOAD (number 1301), in your system's event notification list instead. This opcode is internal to BRM. See ["Configuring Event Notification for Account Synchronization"](#).

---

## About the Account Synchronization DM

The Account Synchronization DM sends business events to the database queue. You define how the DM connects to the database queue and which business events to send to the queue through two configuration files:

- The Account Synchronization DM configuration file (**pin.conf**) specifies how to connect to the queuing database schema.

In a multischema system, to send events to multiple queues in different schemas, you must grant each source schema user execute permission for **acct\_sync** from the target schema (see ["Granting Execute Permission for acct\\_sync"](#)). The Account Synchronization DM connects to only one database schema and uses schema qualifications to send events to queues in other database schemas.

- The **ifw\_sync\_queuenames** file specifies the business events to send to your database queues.

See ["Mapping Business Events to Database Queues"](#).

---

**Note:** If your system contains multiple schemas, you must install and configure an Account Synchronization DM for the primary schema. Optionally, you can also install an Account Synchronization DM for each secondary schema.

---

When the Account Synchronization DM receives a business event, it does the following:

1. Determines which queue to send the event to by checking the **ifw\_sync\_queuenames** file.
2. Enqueues the event in the appropriate queue.
3. Sets the event in the queue to a READY state.

For information, see ["About Event Status Flags"](#).

## About Disconnecting the Account Synchronization DM from the Queue

You can prevent the Account Synchronization DM from enqueueing events to the database queue by using the **pin\_ctl** utility. This enables you to make changes to the queuing database schema without affecting the account synchronization process.

You control the connection between the Account Synchronization DM and the database queue by using the **pin\_ctl** utility. See ["Disconnecting and Reconnecting the Account Synchronization DM to the Queue"](#).

For information about keeping Pipeline Manager online when you tune or shut down the queuing database, see ["About Disconnecting DAT\\_Listener from the Queue"](#).

## About the Database Queues

Account synchronization uses a persistent database queue to pass business events from the Account Synchronization DM to Pipeline Manager. The queue enables account synchronization to pass events asynchronously, so BRM and Pipeline Manager are not required to be running at the same time.

### Creating Database Queues

The Account Synchronization DM installer automatically creates a default queue in a specified database schema. If your system requires multiple queues, you must create additional queues by manually running the **pin\_ifw\_sync\_oracle** utility. See ["pin\\_ifw\\_sync\\_oracle"](#).

---

---

**Important:** To avoid system errors, do not run Pipeline Manager while you run the **pin\_ifw\_sync\_oracle** utility.

---

---

When you create a queue, you must decide the following:

- The database schema in which to create the queue.  
You can create the queue in your BRM database, in the Pipeline Manager database, or in its own separate database.
- The tablespace in which to create the queue.  
You can create the queue in an existing tablespace or in its own separate tablespace.

---

---

**Note:** For optimal performance in production systems, create the queue in its own tablespace in the Pipeline Manager database.

---

---

- The number of queues to create.  
The number of queues to create depends on your system's configuration. Each Pipeline Manager instance connects to its own database queue. Therefore, if your system contains only one instance of Pipeline Manager, you create only one database queue; if your system contains two instances of Pipeline Manager, you create two database queues.  
  
In multischema systems, each BRM database schema has one corresponding instance of Pipeline Manager and one corresponding database queue. See ["Configuring Account Synchronization for Multiple Database Schemas"](#).

### About Event Status Flags

Events in the Oracle Advanced Queuing (AQ) queue are set to the following states:

- **READY** indicates that the event has not been dequeued and processed by DAT\_Listener.



- PROCESSED indicates that the event was dequeued by DAT\_Listener. The Oracle Queue Monitor process (QMn) removes the event from the queue after a configurable amount of time.

You can check the status of events in your queue by running a report. See ["Generating Queue Reports"](#).

## About the DAT\_Listener Module

Pipeline Manager uses DAT\_Listener to retrieve business events from the database queue. When Pipeline Manager is running, DAT\_Listener continuously checks the queue for events to process.

When DAT\_Listener finds an event to process, it does the following:

1. Dequeues the event from the database queue.
2. Sets the event in the queue to a PROCESSED state.
3. Determines where to route the event by using the Pipeline Manager registry.
4. Sends the event to the appropriate pipeline module.

On Oracle AQ systems, DAT\_Listener can control whether Pipeline Manager processes business events or CDRs by interleaving the two processes. You can configure DAT\_Listener for concurrent or interleaved processing. See ["About Controlling the Business Event Backlog"](#).

## About Using Multiple Threads to Dequeue Events

By default, DAT\_Listener uses one thread for dequeuing events. All events in the queue are processed in the order in which they are queued.

You can generate additional threads by using the DAT\_Listener EventThreadAllocation registry entry:

- You can generate separate threads for processing different business events. This can enhance performance when the type of business event, such as RecycleRequest business events, takes longer to process.
- You can generate additional threads for the same type of business event. This can further enhance performance when there are multiple business events of the same type that are queued in succession.

A new thread can begin processing an event as soon as processing for the previous event has begun.

For example, the following registry entry will generate four threads: one thread for RecycleRequest business events, two threads for OpenNewActgCycle business events, and one default thread (for which no entry is required) for all other types of events:

```
EventThreadAllocation
{
 RecycleRequest = 1
 OpenNewActgCycle = 2
}
```

Based on this registry configuration, if the following events are queued in this order:

1. RecycleRequest #1
2. CycleForward #1
3. OpenNewActgCycle #1

4. OpenNewActgCycle #2
5. OpenNewActgCycle #3
6. OpenNewActgCycle #4
7. CycleForward #2
8. RecycleRequest #2
9. CycleForward #3

They are processed during account synchronization in this order:

1. The RecycleRequest thread starts processing RecycleRequest event #1.
2. The default thread starts processing CycleForward event #1.
3. Two OpenNewActgCycle threads process OpenNewActgCycle events #1 through #4, in order.

For example, thread 1 processes event #1 and thread 2 processes event #2. Whichever thread finishes first processes event #3, and so on.

4. When processing starts for OpenNewActgCycle event #4, the default thread starts processing CycleForward event #2 (assuming it has completed CycleForward event #1).
5. When processing starts for CycleForward event #2, the RecycleRequest thread starts processing RecycleRequest event #2 (assuming it has completed RecycleRequest event #1).
6. When processing starts for RecycleRequest event #2, the default thread starts processing CycleForward event #3 (assuming it has completed CycleForward event #2).

You can allocate only one thread for recycle requests.

### Dequeuing in Batches

Dequeuing business events from the Account Synchronization queue takes longer than sending them to Pipeline Manager. To shorten the time it takes to process business events, DAT\_Listener dequeues business events in batches. It then sends one event at a time to Pipeline Manager.

DAT\_Listener retrieves events in batches only for events that require account synchronization, such as account data changes. These are the most frequent types of business events sent through the queue. Other events—for example, those that invoke a process such as a recycling a job—continue to be dequeued one at a time.

If a business event in a batch of dequeued events contains an error, all events in the batch are rolled back in BRM and Pipeline Manager is shut down. Shutting down Pipeline Manager clears the batch of business events from the pipeline memory. After you correct the error and stop and restart Pipeline Manager, BRM resends the business events to Pipeline Manager.

### About Disconnecting DAT\_Listener from the Queue

You can keep Pipeline Manager online when you tune or shut down the queuing database by disconnecting DAT\_Listener from the queue. You can then reconnect the module to the queue after you finish making changes to the database.

When you *disconnect* DAT\_Listener, it performs the following actions:

1. Waits for the total counter of active threads to become 0.

2. Disconnects each active thread:

- If a thread is currently processing an event, DAT\_Listener waits for the event to finish, inactivates the thread, and decrements the counter.
- If a thread is not currently processing an event, DAT\_Listener inactivates the thread and decreases the counter.

3. When the counter becomes 0, DAT\_Listener wakes up from the wait state.

It returns to the caller that all connections between it and the database queue have been terminated.

When you *reconnect* DAT\_Listener, it reconnects to the queuing database and activates all threads.

You control the connection between DAT\_Listener and the database queue by using DAT\_Listener semaphores. See ["Disconnecting and Reconnecting DAT\\_Listener to the Queue"](#).

## About Account Synchronization in a Multischema System

When you use a multischema system, you set up an instance of Pipeline Manager for each database schema. On one instance of Pipeline Manager, you configure the multischema account router module (see "FCT\_AccountRouter" in *BRM Configuring Pipeline Rating and Discounting*). This module keeps track of which database schema each account belongs to.

To set up account synchronization for multiple database schemas, you install and configure an Account Synchronization DM on the primary BRM installation machine and, optionally, on your secondary BRM installation machines. You also do the following:

- **Add a database queue for each BRM database schema.**

Each Account Synchronization DM connects to only one database schema and uses schema qualifications to put event messages in queues in other database schemas.

- **Configure an instance of Pipeline Manager for each BRM database schema.**

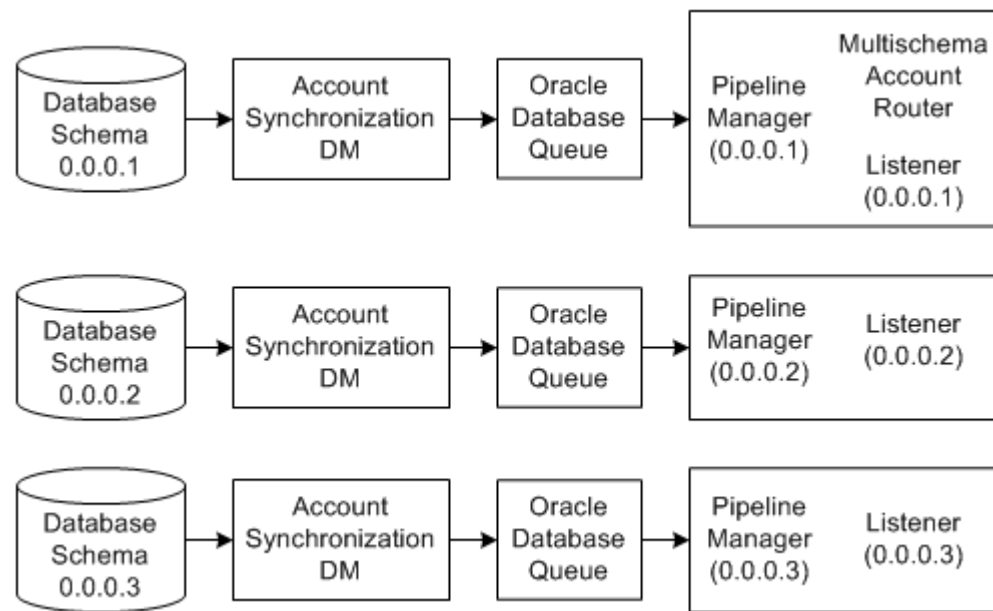
Each instance of Pipeline Manager has a DAT\_Listener module that retrieves events for that instance. You specify the events for each instance in the DAT\_Listener registry.

---

**Note:** It is recommended that you install an instance of the Account Synchronization DM and have a corresponding instance of Pipeline Manager for every BRM database schema, but it is not required. How you configure multiple database schemas depends on your business needs and should be determined by your system and database administrators. See ["BRM Installation Overview"](#) and ["Installing a Multischema System"](#).

---

Figure 21–2 shows the data flow from the Account Synchronization DM to multiple instances of Pipeline Manager:

**Figure 21–2 Data Flow from Account Synchronization DM to Pipeline Manager Instances**

To set up account synchronization for a multischema system, see ["Configuring Account Synchronization for Multiple Database Schemas"](#).

## About the Payload Configuration File

The Account Synchronization DM is an EAI publisher. All EAI publishers in your BRM system use the same payload configuration file. This file defines how EAI applications accumulate and format published information. The name and location of this file is specified in the **infranet.eai.configFile** entry in the EAI properties file (*BRM\_Home/sys/eai\_js/Infranet.properties*).

The Account Synchronization DM includes a payload configuration file (**payloadconfig\_ifw\_sync.xml**). This file defines the business events that the Account Synchronization DM uses to update data in Pipeline Manager.

If your BRM system *does not already have* an EAI-based publisher, the Account Synchronization installation program sets the **infranet.eai.configFile** entry to point to the Account Synchronization payload configuration file.

If your BRM system *already has* an EAI-based publisher installed, the Account Synchronization installation program automatically merges the Account Synchronization payload configuration file with the existing payload configuration file. The merged file is named **payloadconfig\_MergedWithIfw\_sync.xml**, and the **infranet.eai.configFile** entry is updated accordingly. The names and contents of the original files used to create the merged file are not changed by the Account Synchronization installation program.

For more information, see ["Specifying the Default Payload Configuration File"](#).

---

**Caution:** In rare cases, it may not be possible to use the merged payload configuration file. This can happen when entries in the two original payload configuration files have conflicting definitions. You must check for conflicts between the two original files *before* running the Account Synchronization DM. See ["Checking for Conflicts in EAI Payload Configuration Files"](#).

---

## About Controlling the Business Event Backlog

When you use Pipeline Manager for batch rating, the Account Synchronization database queue can become backlogged with business events waiting to be processed. This can delay account synchronization and slow Pipeline Manager performance, causing a greater number of CDRs to be suspended.

To control the number of events waiting to be processed, you can configure DAT\_Listener to interleave CDR and business event processing. For information about how interleaved processing works, see ["About Interleaved Processing"](#). For information about configuring DAT\_Listener for interleaved processing, see ["Configuring Interleaved Processing"](#).

## Why Event Backlog Occurs

Event backlog can occur for the following reasons:

- When Pipeline Manager modules update account data, they lock the accounts they are updating in each transaction. When more than one transaction must access the same account, the transactions must wait until the account is unlocked. If the account stays locked for a relatively long time, business events can become backlogged while they wait for processing.
- When business events arrive that change account information during CDR processing, Pipeline Manager must update its memory before continuing to rate events in the CDR. This requires accessing the database, which adds to the number of times the accounts are locked. With concurrent business event and CDR processing, there could be multiple updates required, further reducing overall Pipeline Manager performance.
- When an account is currently being billed, Pipeline Manager must receive a business event notifying it that billing is complete before it can process new event data records (EDRs) for the account. If a billing business event is waiting to be processed behind a backlog of other events, there might be many new EDRs for the account that require suspending until the billing event is processed. Each time a suspended EDR is recycled, it creates a new business event that is added to the account synchronization queue.

## About Interleaved Processing

You can configure Pipeline Manager to process CDRs and business events exclusively rather than concurrently. With *interleaved processing*, business event and CDR processing are interleaved so that multiple business events can be processed before rating the CDRs, and multiple CDRs can be rated before updating Pipeline Manager memory. This balances the event backlog and improves processing time by decreasing the number of times Pipeline Manager must access the database and lock accounts. Exclusive processing reduces the likelihood that you will need to recycle events due to delayed synchronization or to stop Pipeline Manager to catch up on business event processing.

DAT\_Listener controls whether business events or CDRs are processed based on the following criteria:

- How many business events are waiting to be processed in the Account Synchronization queue.
- The time that Pipeline Manager has been currently processing either business events or CDRs.

You can use the first or both of these criteria, depending on how much control you want over the interleaving process. See ["About Setting Processing Thresholds"](#).

You specify the thresholds for event processing in the DAT\_Listener module registry. See ["Configuring Interleaved Processing"](#).

Assuming both the number of events and the processing time are configured, DAT\_Listener performs the following actions to control interleaved processing:

1. Periodically checks the number of business events waiting to be processed in the Account Synchronization queue and tracks the amount of time that Pipeline Manager has been currently processing either business events or CDRs.
2. Stops pipeline CDR processing when the number of business events in the queue reaches the maximum threshold or when the maximum CDR processing time is reached, whichever comes first.

DAT\_Listener stops Pipeline Manager by sending a stop command to the pipeline controller. This command suspends CDR processing but allows business event processing to proceed.

3. Dequeues business events and sends them to pipelines for processing.
4. Stops dequeuing business events when the number of business events in the queue reaches the minimum threshold or when the maximum business event processing time is reached, whichever comes first.
5. Restarts Pipeline Manager CDR processing by sending a start command to the pipeline controller.

The Account Synchronization DM continues to send business events to the queue while Pipeline Manager processes CDRs.

When tracking the number of business events in the queue, DAT\_Listener counts only the business events that have a state of READY. All other business events are not considered.

## About Setting Processing Thresholds

For basic process interleaving, you set the minimum and maximum business event thresholds. For more control over CDR and business event interleaving, you can also set the maximum CDR and business event processing times.

For example, if you typically process fewer events in the middle of the night, it might take longer to reach the specified maximum number of business events in the queue. Account synchronization will be delayed during this time and you might have a higher incident of CDRs that need suspending or rerating. In this case, you limit the amount of time spent on CDR processing. When this time threshold is reached, DAT\_Listener switches to business event processing even if the number of events in the queue has not reached the maximum.

You might want to limit business event processing time if there are certain times when many business events accumulate in the queue (for example, when you shut down Pipeline Manager for an extended period). When you stop and restart Pipeline

Manager, rather than waiting until the minimum business event threshold is reached, Pipeline Manager switches to CDR processing when the maximum business event process time is reached.

To set the processing thresholds, see "[Configuring Interleaved Processing](#)".

---

**Note:** DAT\_Listener does not check whether there are CDRs waiting to be processed. It checks only for business events and processing times. Therefore, if there are no CDRs to process, DAT\_Listener waits until either the CDR processing time threshold or the maximum number of business events is reached before switching to business event processing. If this wait period is too long, you can update the DAT\_Listener registry to switch from CDR to business event processing. See "[Switching to Business Event Processing When No CDRs Are Waiting](#)".

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## Installing and Configuring Account Synchronization

This chapter describes how to install and configure Oracle Communications Billing and Revenue Management (BRM) Account Synchronization Manager. Anyone who installs, configures, or administers Account Synchronization Manager should read this document.

Before installing Account Synchronization Manager, you should be familiar with how a BRM wireless system and account synchronization work. See the following:

- The description of integrating wireless services in *BRM Telco Integration*.
- The overview of installing wireless services in *BRM Telco Integration*.
- [About Sending Account Data to Pipeline Manager](#)

### About Installing Account Synchronization Manager

Before installing Account Synchronization Manager, you should be familiar with BRM concepts and architecture. See *BRM Concepts*.

---

**Important:** Account Synchronization Manager is an optional feature that requires a separate license.

---

### System Requirements

Account Synchronization Manager is available for the HP-UX IA64, Oracle Solaris, Linux, and AIX operating systems.

#### Software Requirements

Before installing Account Synchronization Manager, you must install the following:

- Oracle Database 10g or Oracle Database 11g.
- Third-Party software, which includes the PERL libraries and JRE required for installing BRM components.  
See ["Installing the Third-Party Software"](#).
- BRM.  
See ["About Planning and Installing a BRM System"](#).
- (Multischema systems only) Multidatabase Manager.  
See ["Installing a Multischema System"](#).

## Information Requirements

You need the following information about your existing BRM system during the Account Synchronization Manager installation:

1. Queuing database alias name
2. Queuing database schema user name and password
3. Queuing database schema name and retention time for the queue in the schema

## Account Synchronization Manager Components

The Account Synchronization Manager components include a Connection Manager (CM), a Data Manager (DM), and an EAI Java server. When you install Account Synchronization, you can install all the components on the same machine (typical install) or install them individually on the same or different machines (custom install).

When you install Account Synchronization Manager, the installation program updates your *BRM\_Home/setup/pin\_setup.values* files with information about the Account Synchronization components.

---

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**Important:** If you install Account Synchronization components individually but on the same machine, the **pin\_setup** files are overwritten with each subsequent install.

To preserve important information, such as port numbers and host names, save a copy of your **pin\_setup.values** file with another name before installing a new component. For example, use the file name **pin\_setup\_orig.values**.

---

---

Account Synchronization contains the following components:

- **Account Synchronization CM:** The Account Synchronization CM is a CM module that contains the EAI framework Facilities Module (FM) and the Account Synchronization FMs.

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---

**Important:** The Account Synchronization CM is dependent on the CM and must be installed on all hosts on which the CM will run.

---

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- **Account Synchronization DM:** The Account Synchronization DM (**dm\_ifw\_sync**) contains files to start and stop the Account Synchronization DM and perform other Account Synchronization DM functions. This component has no dependencies.
- **Account Synchronization EAI Java server:** This Java server contains the files that start and stop the EAI Java server and perform other EAI Java server functions such as merging payload configuration files. This component has no dependencies.

---

---

**Important:** If a Payload Generator External Module (another EAI Java server) has already been installed (as part of installing the EAI Manager or another EAI-based publisher), the Account Synchronization EAI Java server must be installed on the same host where the existing EAI server is installed.

---

---

You can run the Account Synchronization DM and the Payload Generator External Module (EM) on computers other than the computer on which the CM is running. To do this, you must run the Account Synchronization installation program on each computer that hosts one or more of these features.

## Installing and Configuring Account Synchronization

To install Account Synchronization:

1. Configure your database machines for advanced queuing.  
See ["Configuring Database Machines for Advanced Queuing"](#).
2. Install Account Synchronization Manager.  
See ["Installing Account Synchronization Manager"](#).
3. Create additional Account Synchronization queues.  
See ["Creating Additional Account Synchronization Queues"](#).
4. If your system contains queues in multiple database schemas, grant execute permission for **acct\_sync**.  
See ["Granting Execute Permission for acct\\_sync"](#).
5. Configure the EAI payload for Account Synchronization.  
See ["Configuring the EAI Payload for Account Synchronization"](#).
6. Enable event notification.  
See ["Configuring Event Notification for Account Synchronization"](#).
7. Configure Account Synchronization.  
See ["Configuring Account Synchronization"](#).
8. Configure the DAT\_Listener module.  
See ["Configuring the DAT\\_Listener Module"](#).
9. Set up service-level bill items.  
See ["Setting Up Service-Level Bill Items"](#).
10. Enable BRM to audit GSM (Global System for Mobile Communication) objects.  
See ["Turning On Object Auditing"](#).
11. Configure Account Synchronization for multiple database schemas.  
See ["Configuring Account Synchronization for Multiple Database Schemas"](#).

## Configuring Database Machines for Advanced Queuing

Before you install Account Synchronization Manager, you must configure all queuing database machines for advanced queuing.

Perform the following on each queuing database machine in your system:

1. Open the *Oracle\_Home/dbs/initSID.ora* file in a text editor, where *Oracle\_Home* is the directory in which you installed the Oracle Database.
2. Set the **compatible** parameter to your Oracle database version.

---

**Important:** If you use an entry lower than **10.0**, your BRM and Pipeline Manager systems fail.

---

3. Specify one queue monitor process (QMn) by setting the **aq\_tm\_process** parameter to **1**.

The queue monitor process removes from the queue any processed events that are over an hour old.

4. Save and close the file.
5. Using SQL\*Plus, log in to your database as the SYS user and grant advanced queuing privileges to each schema user in your system:

```
% sqlplus sys/password@databaseAlias
```

```
SQL> grant execute on dbms_aq to schema_user_name;
```

Grant succeeded.

```
SQL> grant execute on dbms_aqadm to schema_user_name;
```

Grant succeeded.

```
SQL> grant select on sys.gv_$aq to schema_user_name;
```

Grant succeeded.

```
SQL> grant execute on dbms_lock to schema_user_name;
```

Grant succeeded.

where *schema\_user\_name* is the user name for the schema to which you are granting privileges.

6. Initialize the database instance with your changes by stopping and restarting the Oracle database.

## Installing Account Synchronization Manager

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**Note:** If you have already installed the product, features that are already installed cannot be reinstalled without uninstalling them first. To reinstall a feature, uninstall it and then install it again.

---

To install Account Synchronization Manager:

1. Download the Account Synchronization Manager software package (**7.5.0\_AccountSynchTool\_platform\_opt.bin**) for the appropriate platform from the Oracle software delivery Web site (<https://edelivery.oracle.com>) 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. For information, see ["Increasing Heap Size to Avoid “Out of Memory” Error Messages"](#).
- 

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

---

**Note:** 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 the following command:

```
7.5.0_AccountSynchTool_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. (Optional) To install Account Synchronization features separately, either on this computer or on another computer, select custom install when asked to specify the setup type.

Select the components you are installing by entering their respective numbers. The features are:

- **AcctSync\_CM**
- **AcctSync\_DM**
- **AcctSync\_EAI\_JS**

5. Click **Next**.
6. Follow the instructions displayed during installation.

The default installation directory for Account Synchronization Manager is **opt/portal/7.5**.

---

---

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

---

---

7. Go to the directory where you installed the Account Synchronization Manager package and source the **source.me** file:

Bash shell:

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

C shell:

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

8. Go to the *BRM\_Home/setup* directory and run the **pin\_setup** script.

---

---

**Note:** The **pin\_setup** script starts all required BRM processes.

---

---

The script creates a queue in the specified database schema, configures your **pin.conf** files, and starts all of your BRM processes.

9. Stop the Account Synchronization DM process.

For information, see ["Starting and Stopping the Account Synchronization DM"](#).

## Creating Additional Account Synchronization Queues

The Account Synchronization Manager installer automatically creates a default queue in a specified database schema. If your system requires multiple queues, create additional queues by manually running the **pin\_ifw\_sync\_oracle** utility.

---

---

**Important:** To avoid system errors, do not run Pipeline Manager while running the **pin\_ifw\_sync\_oracle** utility.

---

---

To create an additional database queue:

1. Verify the default queue storage and retention time settings in the **create\_ifw\_sync\_queue.conf** file.

For more information, see:

- [Configuring the Queue Location](#)
- [Configuring How Often Processed Events Are Removed from the Queue](#)

2. Enter the following command, which logs you in as the **pin** user:

```
su - pin
```

---

---

**Note:** To create queues, the **pin** user must have Oracle Advanced Queuing (AQ) privileges.

---

---

3. Run the following command, which creates a new queue:

```
pin_ifw_sync_oracle.pl create -q queue_name -t queue_table -l
user/password@database_alias
```

where:

- *queue\_name* is the name of the new queue. If you omit this parameter the utility creates a database queue named IFW\_SYNC\_QUEUE.

---

**Important:** In multischema systems, all queues in a schema must have unique names, but the same queue name can be used across multiple schemas.

---

- *queue\_table* is the name of the database table that contains the *queue\_name*. If you omit this parameter, the utility creates a queue table named IFW\_SYNC.
  - *user* is a valid user name for accessing the database.
  - *password* is the password for the specified *user*. If you omit this parameter, the utility will prompt you for this information.
  - *database\_alias* is the BRM database alias of the database to which you are adding a queue. If you omit this parameter the utility will prompt you for this information.
4. Run the following command, which verifies that the queue was created and functions properly by attempting to enqueue and dequeue 20 test events:

```
pin_ifw_sync_oracle.pl test -q queue_name -l user/password@database_alias
```

The utility enqueues and dequeues 20 test events.

---

**Note:** You only need to test a queue after it has first been created.

---

5. Run the following command, which generates a summary report that displays the state of each event in the queue:

```
pin_ifw_sync_oracle.pl report -r summary -q queue_name -l
user/password@database_alias
```

If the tests were successful, the report lists the 20 events with a processed state:

```
Tue Feb 04 page 1
 Event Summary Report
Evt. Stat Event Name Event Count

PROCESSED LongTestEvent 10
 ShortTestEvent 10

sum 20
```

If unsuccessful, you must drop and then recreate the queue and queue table. For information, see ["Dropping the Queue and Queue Tables"](#).

For more information about the `pin_ifw_sync_oracle` utility, see ["pin\\_ifw\\_sync\\_oracle"](#).

## Creating an Acknowledgment Queue for Account Migration Manager

In a system containing Account Migration Manager, an acknowledgment queue pushes AMM-related events. Multiple pipelines, associated with different schemas, can connect to this one acknowledgment queue and send acknowledgment events. If events are enqueued into an acknowledgment queue that resides in a different schema, you must specify the schema name in the **create\_ifw\_sync\_queue.conf** file.

To modify the default schema name in the **\$primary\_schema** parameter:

1. Open the *BRM\_Home/apps/pin\_ifw\_sync/create\_ifw\_sync\_queue.conf* file in a text editor.
2. Add or modify the following entry:

```
$primary_schema = "schema_name";
```

where *schema\_name* is the name of the schema that contains the acknowledgment queue into which events are enqueued. Use **pin** if the acknowledgment queue resides in the local schema.

---

**Note:** For example, if the acknowledgment queue is configured in schema **pin01** and the events from schema **pin02** have to be enqueued into that acknowledgment queue:

```
$primary_schema = "pin01"
```

---

3. Save and close the file.
4. To enable access to the schema where the acknowledgment queue resides:
  - a. Create a new *file\_name.sql* file.
  - b. Add the following commands to *file\_name.sql*:

```
set serveroutput on;
BEGIN
EXECUTE IMMEDIATE 'GRANT EXECUTE ON PIN_EVENT_TY TO schema_name ;
DBMS_AQADM.GRANT_QUEUE_PRIVILEGE(
privilege => 'ALL',
queue_name => 'queue_name',
grantee => 'schema_name',
grant_option => FALSE);
EXECUTE IMMEDIATE 'GRANT SELECT ON AQ$queue_table TO schema_name';
EXECUTE IMMEDIATE 'GRANT UPDATE ON AQ$queue_table TO schema_name';
END;
```

-----

where:

*queue\_name* is the acknowledgment queue name.

*schema\_name* is the schema from which events are enqueued to the acknowledgment queue.

*queue\_table* is the database table that contains the acknowledgment queue.

---

**Note:** Execute the GRANT statements for each schema from which events are enqueued to the acknowledgment queue.

---



For example:

```
BEGIN
EXECUTE IMMEDIATE 'GRANT EXECUTE ON PIN_EVENT_TY TO PIN02 ;
DBMS_AQADM.GRANT_QUEUE_PRIVILEGE(
privilege => 'ALL',
queue_name => 'IFW_SYNC_QUEUE_AMT',
grantee => 'PIN02',
grant_option => FALSE);
EXECUTE IMMEDIATE 'GRANT SELECT ON AQ$IFW_SYNC_QUEUE_AMT_T TO PIN02';
EXECUTE IMMEDIATE 'GRANT UPDATE ON AQ$IFW_SYNC_QUEUE_AMT_T TO PIN02';
END;
```

5. Open SQL \*Plus by entering the following command:

```
sqlplus pin/pin@ORACLE_SID
```

where *ORACLE\_SID* is the BRM database alias.

6. From the schema where the acknowledgment queue is configured, run the following command:

```
@file_name.sql
```

7. Run the **pin\_ifw\_sync\_oracle** utility. See ["Creating Additional Account Synchronization Queues"](#) for more information.

## Granting Execute Permission for acct\_sync

If your system contains queues in multiple database schemas, you must grant execute permission for the **acct\_sync** package from each queuing database schema to every other queuing database schema. This enables **dm\_ifw\_sync** to forward events to queues residing on other database schemas.

---

**Note:** If you do not have a multischema system, skip this section and go to ["Configuring the EAI Payload for Account Synchronization"](#).

---

To grant execute permission for **acct\_sync**:

1. Log in to a target database schema:

```
sqlplus target_schema_user_name/password@database_alias
```

where:

- *target\_schema\_user\_name* is the user name for a schema *to* which events are forwarded from a source schema.
- *password* is the password for the target schema user name.
- *database\_alias* is the BRM database alias of the target schema.

2. Grant execute privileges to the source schema:

```
SQL> grant execute on acct_sync to source_schema_user_name
```

where *source\_schema\_user\_name* is the user name for the schema *from* which events are forwarded to the target.

For example, if **dm\_ifw\_sync** connects to the **pin1** database schema, enable it to send an event to the **pin2** schema as follows:

1. Log in to the **pin2** schema:

```
sqlplus pin2/password@database_alias
```

where:

- *password* is the password for the **pin2** schema user name.
- *database\_alias* is the BRM database alias of the **pin2** schema.

2. Grant execute privileges to the **pin1** schema:

```
SQL> grant execute on acct_sync to pin1
```

## Configuring the EAI Payload for Account Synchronization

You must modify your BRM system's payload configuration file in the following situations:

- If you have another EAI-based publisher, you must do the following:
  - Check for conflicts in the EAI payload configuration files.  
See ["Checking for Conflicts in EAI Payload Configuration Files"](#).
  - Specify the default configuration file.  
See ["Specifying the Default Payload Configuration File"](#).
- If your Account Synchronization DM database number is not the default (0.0.9.9).  
See ["Specifying the Account Synchronization DM Database Number"](#).
- If you uninstall the Account Synchronization DM. See ["Revising the Payload Configuration File When Uninstalling Account Synchronization Manager"](#).

For information about defining business events in the EAI payload configuration file, see *BRM Developer's Guide*.

### Checking for Conflicts in EAI Payload Configuration Files

If your BRM system already has an EAI publisher, the Account Synchronization Manager installation program merges this file with the existing payload configuration file.

---

---

**Note:** If you do not have an existing EAI publisher application, skip this section and go to ["Specifying the Account Synchronization DM Database Number"](#).

---

---

In rare cases, conflicts can occur when the Account Synchronization Manager payload configuration file is merged with an existing payload configuration file. This can happen when entries in the two original configuration files have conflicting definitions.

---

---

**Important:** You must determine whether merge conflicts exist *before* running Account Synchronization Manager.

---

---

Compare the Account Synchronization Manager payload configuration file (*BRM\_Home/sys/eai\_js/payloadconfig\_ifw\_sync.xml*) with the existing payload configuration file (referenced in *BRM\_Home/sys/eai\_js/Infranet.properties*). If any of

the following conditions exist, it is not possible to run both EAI publishers in the same BRM system:

- Two different business event definitions specify the same **StartEvent**.
- The same business event definitions have different values for one or more of these attributes: **StartEvent**, **EndEvent**, or **Source**.
- The same business event or element definitions have different search criteria.
- The same element definitions have different values for one or more of the following attributes: **Source**, **PinFld**, **DataFrom**, **UseOnlyElement**, or **Tag**.
- The same element definitions have different **OnEvent** values.

### Specifying the Default Payload Configuration File

If your BRM system already has an EAI publisher, you must make the **payloadconfig\_MergedWithIfw\_sync.xml** file your system's default payload configuration file.

---

**Note:** If you do not have an existing EAI publisher application, skip this section and go to "[Specifying the Account Synchronization DM Database Number](#)".

---

To specify the default payload configuration file, do one of the following:

- Change the EAI **configFile** entry so that it points to the merged payload configuration file:
  1. Open the *BRM\_Home/sys/eai\_js/Infranet.properties* file in a text editor.
  2. Set the **infranet.eai.configFile** entry to point to the *BRM\_Home/sys/eai\_js/payloadconfig\_MergedWithIfw\_sync.xml* file:
 

```
infranet.eai.configFile=./payloadconfig_MergedWithIfw_sync.xml
```
  3. Save and close the file.
- Rename the configuration file and the **configFile** entry to match each other:
  1. Change the name of the file specified in the **infranet.eai.configFile** entry. For example, change **payloadconfig.xml** to **payloadconfig\_eai.xml**.
  2. Change the name of the *BRM\_Home/sys/eai\_js/payloadconfig\_MergedWithIfw\_sync.xml* file to match the file name specified in the **infranet.eai.configFile** entry.

### Specifying the Account Synchronization DM Database Number

The default BRM database number for your Account Synchronization DM is 0.0.9.9. If you change your database number, you must change the value of the **DB** attribute in the Account Synchronization DM publisher definition.

---

**Note:** If you did not change the default database number for your Account Synchronization DM, go to "[Configuring Event Notification for Account Synchronization](#)".

---

To specify the Account Synchronization DM database number:

1. Open the *BRM\_Home/sys/eai\_js/payloadconfig\_ifw\_sync.xml* file, or open the merged file if you merged payload configuration files, in a text editor.
2. Find the **<PublisherDefs>** section.
3. In the **Publisher DB** entry, enter the correct BRM database number.

For example, if your Account Synchronization DM database number is 0.0.9.5, change this entry:

```
<PublisherDefs>
 <Publisher DB="0.0.9.9" Format="FLIST">
```

to this:

```
<PublisherDefs>
 <Publisher DB="0.0.9.5" Format="FLIST">
```

4. Save and close the file.

### Revising the Payload Configuration File When Uninstalling Account Synchronization Manager

To remove Account Synchronization elements from your system's EAI payload configuration file after uninstalling Account Synchronization Manager:

1. Open the *BRM\_Home/sys/eai\_js/payloadconfig\_ifw\_sync.xml* file, or open the merged file if you merged payload configuration files, in a text editor.
2. Find the **<PublisherDefs>** section.
3. Remove the following publisher definition:

```
<Publisher DB="database_number" Format="FLIST">
```

4. Save and close the file.
5. Stop and restart the Payload Generator External Module (the EAI Java server) by entering the following command from the *BRM\_Home/bin* directory:

```
pin_ctl bounce eai_js
```

## Configuring Event Notification for Account Synchronization

When a BRM event that is included in a business event defined in the Account Synchronization Manager payload configuration file occurs, the EAI framework uses event notification to call the opcode that caches the BRM event in the Payload Generator. See "About Event Notification" in *BRM Developer's Guide*.

To configure the event notification feature:

1. If your system has multiple configuration files for event notification, merge them.
2. Ensure that the merged file includes the entire event notification list in the *BRM\_Home/sys/data/config/pin\_notify\_ifw\_sync* file.
3. (Optional) If you defined new business events for Account Synchronization, you must edit your final event notification list to include all the BRM events in the new business events.
4. Load your final event notification list into the BRM database.

## Configuring Account Synchronization

To configure the Account Synchronization DM to connect to the BRM database and the database queue:

1. Connect the Account Synchronization Manager's EAI framework to BRM by editing the CM configuration file (**pin.conf**).  
See ["Configuring the CM for Account Synchronization"](#).
2. Map BRM business events to the appropriate database queue by editing the **ifw\_sync\_queuenames** file.  
See ["Mapping Business Events to Database Queues"](#).
3. Connect the Account Synchronization DM to the database queue by editing the Account Synchronization DM configuration file (**pin.conf**).  
See ["Configuring the Account Synchronization DM"](#).

### Configuring the CM for Account Synchronization

You must modify the CM **pin.conf** file to enable the EAI framework to notify Account Synchronization Manager when specific events occur. You should also verify that the pointer to the Account Synchronization DM specifies the correct database and port numbers.

---

**Important:** If you use a multischema system and set up more than one CM, you must edit the configuration file for each CM.

---

To configure the CM for account synchronization:

1. Open the CM configuration file (*BRM\_Home/sys/cm/pin.conf*) in a text editor.
2. Set the **enable\_publish** entry to **1**:  

```
- fm_publish enable_publish 1
```
3. Verify that the **dm\_pointer** entry for **dm\_ifw\_sync** specifies the correct database number and port:  

```
- cm dm_pointer 0.0.9.9 ip host_name/ip_address 11999
```

where:

- **0.0.9.9** is the default Account Synchronization DM database number.
- *host\_name/ip\_address* is the host name or IP address of the computer on which the Account Synchronization DM runs.
- **11999** is the default Account Synchronization DM port number.

---

**Note:** If you change the location of the Account Synchronization DM, you must modify this entry. For more information, see the description of using configuration files to connect and configure components in *BRM System Administrator's Guide*.

---

---

**Important:** The Account Synchronization DM *database number* must match the number in the following entries:

- The **dm\_db\_no** entry in the Account Synchronization DM configuration file (*BRM\_Home/sys/dm\_ifw\_sync/pin.conf*).
- The **DB** entry of the Account Synchronization Publisher definition in the payload configuration file (*BRM\_Home/sys/eai\_js/payloadconfig\_ifw\_sync.xml*).

The Account Synchronization DM *port number* must match the number in the **dm\_port** entry in the Account Synchronization DM configuration file (*BRM\_Home/sys/dm\_ifw\_sync/pin.conf*).

---

4. Save and close the file.
5. Stop and restart the CM:
  - From the *BRM\_Home/bin* directory, enter this command:  
**pin\_ctl bounce cm**

### Mapping Business Events to Database Queues

You configure which events the Account Synchronization DM sends to each database queue by editing the **ifw\_sync\_queuenames** file. This file must specify the names of all the queues in your system and which events to send to each queue.

---

**Note:**

- Only business events that are defined in the **payloadconfig** file can be sent to a database queue.
  - Account synchronization does not send events to queues until you edit the **ifw\_sync\_queuenames** file.
- 

To map business events to database queues:

1. Open the *BRM\_Home/sys/dm\_ifw\_sync/ifw\_sync\_queuenames* file in a text editor.
2. Add an entry for each queue in your system by using the following syntax:

```
schema_name.queue_name
{
 criteria
}
```

where:

- *schema\_name* is the name of the database schema containing the queue.  
In multischema systems, each instance of the Account Synchronization DM connects to only one database queue in only one schema. That schema is the DM's local schema. In some cases, the Account Synchronization DM receives an event that belongs to a queue in a different schema (for example, when you move an account from one schema to another). Oracle AQ uses the queue name entries in the **ifw\_sync\_queuenames** file to send the events to the appropriate queue:

- If a queue is on the local database schema, do not include *schema\_name* in the entry.
- If a queue is on a remote database schema, prepend the queue name with the name of the database schema to which it belongs.
- *queue\_name* is the name you assigned the queue when you created it. Each queue name must match the queue name in the corresponding DAT\_Listener registry.
- *criteria* specifies which events to send to the queue. You can configure the Account Synchronization DM to send all business events, only events from a specific database schema, or only specific event types. [Table 22–1](#) shows the syntax for each criteria:

**Table 22–1 Syntax to Add Events to Queues**

To Send This	Use This Syntax	Example
All business events	ALL	ALL
Only business events from a specific database schema	0.0.0.x	0.0.0.1
Only specific event types	<i>eventName</i>	CustCreate ProductCancel
Excluding specific event types	<i>!eventName</i>	!CustCreate !ProductCancel
A specific event from a specific database	0.0.0.x AND <i>eventName</i>	0.0.0.1 AND ProductCancel
Excluding a specific event from a specific database	0.0.0.x AND <i>!eventName</i>	0.0.0.1 AND !ProductCancel

For example, to send all business events from BRM database schema 0.0.0.1 to the local IFW\_SYNC\_QUEUE\_1 queue and only CustCreate events to the IFW\_SYNC\_QUEUE\_2 queue, which resides in another database schema, use the following syntax:

```
IFW_SYNC_QUEUE_1
{
 0.0.0.1
}

schema_name.IFW_SYNC_QUEUE_2
{
 CustCreate
}
```

### 3. Save and close the file.

## Mapping Events in Systems Containing Multiple ifw\_sync\_queuenames Files

In a multischema system, each BRM installation machine on which an instance of the Account Synchronization DM is installed contains an **ifw\_sync\_queuenames** file for that DM.

The **ifw\_sync\_queuenames** file of the primary Account Synchronization DM must include one or more queue entries for every database schema in your system.

For example, if you use three database schemas, the entries in the **ifw\_sync\_queuenames** file of the primary Account Synchronization DM, which is connected to schema 0.0.0.1, look like this:

```
IFW_SYNC_ROUTER_QUEUE
{
 CustCreate
 ServiceLogin
 CustDelete
}

IFW_SYNC_QUEUE_1 # queue on local database schema
{
 0.0.0.1
}
0.0.0.2.IFW_SYNC_QUEUE_2 # queue on remote database schema
{
 0.0.0.2
}
0.0.0.3.IFW_SYNC_QUEUE_3 # queue on remote database schema
{
 0.0.0.3
}
```

---

**Note:** In the preceding example, the queue that connects to the Pipeline Manager instance containing the multischema account router (IFW\_SYNC\_ROUTER\_QUEUE) is on the same database schema as the primary queue (IFW\_SYNC\_QUEUE\_1).

The multischema account router is interested in only **CustCreate**, **ServiceLogin**, and **CustDelete** events. However, you can alternatively specify **ALL** to have all events sent to the router.

---

Any **ifw\_sync\_queuenames** file on a secondary installation machine needs to include entries for only local queues. For example, the entry in the **ifw\_sync\_queuenames** file of a secondary Account Synchronization DM connected to schema 0.0.0.2 looks like this:

```
IFW_SYNC_QUEUE_2 # queue on local database schema
{
 0.0.0.2
}
```

## Configuring the Account Synchronization DM

During installation, the Account Synchronization DM installer generates a **pin.conf** configuration file that specifies how to connect to your BRM database and database queue and that contains other configuration settings. The installer populates the connection entries with values from your **pin\_setup.values** file and provides default information for the other configuration entries. Before you start the Account Synchronization DM, verify that the file contains accurate information for connecting to your BRM database and database queue.

In multischema systems, each BRM database schema might have its own Account Synchronization DM. Verify that each Account Synchronization DM **pin.conf** file contains accurate information for its associated database schema and queue.

To configure the Account Synchronization DM:



---

**Note:** Do this for each instance of Account Synchronization DM.

---

1. Open the (*BRM\_Home/sys/dm\_ifw\_sync/pin.conf*) file in a text file.
2. Verify that the **plugin\_name** entry specifies the path and file name of the correct shared library file:

```
-dm plugin_name path/name
```

where *name* is one of the following:

- **libplugin\_ifw\_syncdatabase\_version.so** for Solaris, Linux, and HP-UX IA64
- **libplugin\_ifw\_syncdatabase\_version.a** for AIX

*database\_version* is the version number of your Oracle database.

3. Verify that the **queue\_map\_file** entry specifies the path and file that maps the database queues to the events they are to receive.

For example:

```
- dm_ifw_sync queue_map_file ./ifw_sync_queueenames
```

For more information, see ["Mapping Business Events to Database Queues"](#).

4. Verify that the **sm\_database** entry specifies the alias name of the queuing database to which the Account Synchronization DM connects.

The value of this entry should be the TNSNAMES.ORA alias, which can be found in the *Oracle\_Home/network/admin/tnsnames.ora* file:

```
- dm_ifw_sync sm_database alias_name
```

5. Verify that the **sm\_id** entry specifies the database schema user name that the Account Synchronization DM uses to log in to the queuing database schema:

```
- dm_ifw_sync sm_id user_name
```

6. Verify that the **sm\_pw** entry specifies the password for the user specified in the **sm\_id** entry:

```
- dm_ifw_sync sm_pw password
```

7. (Optional) You can also edit the entries in [Table 22-2](#):

**Table 22-2 Entries That Are Editable**

Entry Name	Description
<b>connect_retries</b>	Specifies the number of times that the Account Synchronization DM attempts to connect to the database queue.
<b>retry_interval</b>	Specifies the length of time, in seconds, that the Account Synchronization DM waits before attempting to reconnect to the database queue.

For more information, see ["Configuring Account Synchronization DM Database Connection Attempts"](#).

For other entries you can edit, see the comments in the **pin.conf** file.

8. Save and close the file.

## Configuring the DAT\_Listener Module

Each instance of Pipeline Manager is connected to one database queue. You must configure each instance's DAT\_Listener module to connect to its corresponding database queue by modifying the Pipeline Manager registry.

### Configuring the Registry

Perform the following tasks for each instance of Pipeline Manager:

1. Open the registry file.
2. Add the following entries to the Listener section of the registry file:

---

**Important:** The Listener section must be listed after the pipeline and BRM database connection sections. Otherwise, Pipeline Manager fails to start.

---

```
Listener
{
 ModuleName = DAT_Listener
 Module
 {
 InfranetConnection = #mandatory
 QueueName = #mandatory
 QueueLibrary = #mandatory
 ConnectRetries = #optional
 RetryInterval = #optional
 LogEvents = #optional
 }
}
```

where:

- **InfranetConnection** points to the section of the registry file that specifies how the Account Synchronization DM connects to the database queue.  
For example, **ifw.DataPool.LoginAccountSync**. This entry is mandatory.
- **QueueName** specifies the queue name.  
For example, **IFW\_SYNC\_QUEUE**. This entry is mandatory.
- **QueueLibrary** specifies if the Listener should use Oracle queue libraries. Enter **OracleQueue**.
- **ConnectRetries** specifies the number of times the DAT\_Listener module retries to connect to the database queue.  
This entry is optional. The default is **0**.
- **RetryInterval** specifies the time, in seconds, between reconnection attempts.  
This entry is optional. The default is **5**.
- **LogEvents** specifies whether the entire contents of each business event is copied to a log file.  
This entry is optional. The default is **FALSE**.

3. Save and close the file.

## Configuring Interleaved Processing

You can control how many events are waiting to be processed simultaneously by configuring DAT\_Listener to interleave call detail record (CDR) and business event processing. For more information, see ["About Controlling the Business Event Backlog"](#).

---

**Note:** The following entries are optional. If not present, Pipeline Manager processes CDRs and business events concurrently.

---

To interleave processing between CDR and business events:

1. Open the registry file.
2. Add the following entries to the Listener section of the registry file:

```
Listener
{
 ModuleName = DAT_Listener
 Module
 {
 #Add the following lines for interleaved processing:
 InterleavingReqd = true
 MaxNumEvents =
 MinNumEvents =
 CheckInterval =
 EnableInterLeavingStatistics =
 ProcessAllEvents =
 MaxEventProcessTime =
 MaxCDRProcessTime =
 }
}
```

where:

- **InterleavingReqd** specifies whether interleaved processing is enabled.  
The default is **False**. When set to **False** or not specified, interleaved processing is not performed; CDRs and events are processed simultaneously.
- **CheckInterval** specifies (in seconds) how frequently DAT\_Listener checks the number of events waiting in the queue (specified by **MaxNumEvents** and **MinNumEvents**) and the amount of processing time that has passed (specified by **MaxCDRProcessTime** and **MaxEventProcessTime**).  
The default is **60**. If this entry is not present, the default interval is used.

---

**Note:** This entry takes precedence over **MaxNumEvents**, **MinNumEvents**, **MaxEventProcessTime**, and **MaxCDRProcessTime**. If **CheckInterval** is set too high, DAT\_Listener will not switch between CDR and event processing even if the thresholds have been reached. For example, if **MaxEventProcessTime** is set as 3600 seconds and **CheckInterval** is set to 7200 seconds, events are processed for 7200 seconds before the processing time is checked.

---

- **MaxNumEvents** specifies the maximum number of business events allowed in the queue.  
The default is **900**. When the number of events in the queue reaches or exceeds this amount, DAT\_Listener stops CDR processing and starts business event

processing. When this entry is specified, **MinNumEvents** must also be specified.

- **MinNumEvents** specifies the minimum number of business events allowed in the queue.

The default is **300**. When the number of events in the queue reaches or drops below this amount, DAT\_Listener stops business event processing and starts CDR processing. When this entry is specified, **MaxNumEvents** must also be specified.

- **EnableInterLeavingStatistics** specifies whether to log only interleaving statistical data.

The default is **False**. By default, DAT\_Listener logs all processing messages in the pipeline processing log (**process.log**). If this entry is set to **True**, only statistical data related to the rate of interleaved processing is logged. You can use this entry to monitor your event processing performance.

- **ProcessAllEvents** specifies whether to process all events in the queue when Pipeline Manager is started.

A value of **True** processes all events in the queue before activating interleaved processing. A value of **False** activates interleaved processing at startup, and events are processed according to the interleaving settings.

If set to **True** at startup, after processing all events, this entry is reset to **False**. To use this feature, you must reset this entry to **True** each time you restart Pipeline Manager.

- **MaxEventProcessTime** specifies the maximum number of seconds that business events are processed.

The default is **60**. When Pipeline Manager has been processing business events for this amount of time, DAT\_Listener stops business event processing and starts CDR processing regardless of how many business events are in the queue. When this entry is specified, **MaxNumEvents**, **MinNumEvents**, and **MaxCDRProcessTime** must also be specified.

- **MaxCDRProcessTime** specifies the maximum number of seconds that CDRs are processed.

The default is **300**. When Pipeline Manager has been processing CDRs for this amount of time, DAT\_Listener stops CDR processing and starts business event processing regardless of how many CDRs are in the queue. When this entry is specified, **MaxNumEvents**, **MinNumEvents**, and **MaxEventProcessTime** must also be specified.

---

**Important:** The default values for interleaved processing are also the minimum required values. If you specify a value less than the default for any entry, that value is ignored and the default value is used.

Some entries can be used in a semaphore to update the processing thresholds. If these semaphores contain an error, the pipeline is deactivated and you must reactivate it. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

---

3. Save and close the file.

### Switching to Business Event Processing When No CDRs Are Waiting

When there are no CDRs to process, DAT\_Listener waits until either the CDR processing time threshold is reached or the maximum number of business events is reached before switching to business event processing. If this wait period is too long, you can shorten the CDR processing time by using a semaphore to update the DAT\_Listener registry. The new semaphore value becomes effective the next time DAT\_Listener checks for the number of events and elapsed processing time. This is determined by the **CheckInterval** registry entry. For example, if **CheckInterval** is set to 180 seconds, the semaphore update becomes effective after 180 seconds have elapsed.

Use one of the following semaphores to shorten the CDR processing time so that business events are processed sooner:

- Shorten the CDR processing time by changing the **MaxCDRProcessTime** value:

```
ifw.DataPool.Listener.Module.MaxCDRProcessTime=new_value
```

- Reduce the maximum number of business events by changing the **MaxNumEvents** value:

```
ifw.DataPool.Listener.Module.MaxNumEvents=new_value
```

If the number of business events waiting in the queue exceeds the new value, DAT\_Listener immediately switches to business event processing when it checks the number of events.

## Setting Up Service-Level Bill Items

To enable Pipeline Manager to choose the correct bill item for an event, you must configure BRM to pre-create service-level items. (For more information, see the description of how Pipeline Manager assigns delayed events to items in *BRM Configuring Pipeline Rating and Discounting*.)

To set up service-level bill items, run the **load\_config\_item** utilities to load the contents of the **config\_item\_tags** and **config\_item\_types** files into the BRM database. For more information, see the description of creating custom bill items in *BRM Configuring and Running Billing*.

## Turning On Object Auditing

After installing Account Synchronization Manager, you must enable BRM to audit GSM objects. Auditing objects creates a history of certain information, such as phone numbers and logins, so that BRM can track changes.

For a list of default objects, see "[Required Objects to Be Audited](#)".

The **object\_auditing.pl** script invokes the **pin\_history\_on** utility to load the file containing the objects to audit and turn on object auditing. It then creates the audit table indexes in the BRM database.

**Caution:**

- When installing wireless managers such as Account Synchronization Manager or GSM Manager, you must install *all* managers *before* running this script. If you run this script before installing a wireless manager, your installation will fail.
- If you use a multischema system, do the following:
  1. Install all wireless managers.
  2. Install your multischema system.
  3. Run the **object\_auditing.pl** script.

To enable additions of GSM objects, enter the following command:

```
perl object_auditing
```

**Note:** The **object\_auditing.pl** script requires a **pin.conf** configuration file. You can create one (see the description of configuration files in *BRM System Administrator's Guide*), or you can run the utility from a directory that contains a **pin.conf** file, such as *BRM\_Home/sys/dm\_ifw\_sync*.

For more information, see "[object\\_auditing](#)".

You can customize audit table indexes or the list of audited objects by modifying the input files before running the **object\_auditing.pl** script:

- To customize the list of audited objects, edit the *BRM\_Home/apps/integrate\_sync/pin\_history\_on\_input* file.
- To customize your audit table indexes, edit the *BRM\_Home/sys/dd/data/create\_indexes\_audit\_tables\_oracle.source* file.

### Required Objects to Be Audited

Pipeline Manager requires certain objects to be audited, which are included in the *BRM\_Home/apps/integrate\_sync/pin\_history\_on\_input* file. [Table 22–3](#) lists the default objects and their fields configured in the file:

**Table 22–3** Objects Configured in *pin\_history\_on\_input*

Object	Fields Audited by Default
/account	<ul style="list-style-type: none"> <li>■ PIN_FLD_BRAND_OBJ</li> <li>■ PIN_FLD_ACCOUNT_NO</li> <li>■ PIN_FLD_CURRENCY</li> <li>■ PIN_FLD_RESIDENCE_FLAG</li> <li>■ PIN_FLD_PRODUCTS.PIN_FLD_USAGE_END_T</li> <li>■ PIN_FLD_PRODUCTS.PIN_FLD_USAGE_START_T</li> </ul>
/profile/acct_extrating	<ul style="list-style-type: none"> <li>■ PIN_FLD_DATA_ARRAY.PIN_FLD_NAME</li> <li>■ PIN_FLD_DATA_ARRAY.PIN_FLD_VALUE</li> <li>■ PIN_FLD_DATA_ARRAY.PIN_FLD_VALID_FROM</li> <li>■ PIN_FLD_DATA_ARRAY.PIN_FLD_VALID_TO</li> </ul>

**Table 22–3 (Cont.) Objects Configured in pin\_history\_on\_input**

Object	Fields Audited by Default
/profile/serv_extrating	<ul style="list-style-type: none"> <li>▪ PIN_FLD_DATA_ARRAY.PIN_FLD_NAME</li> <li>▪ PIN_FLD_DATA_ARRAY.PIN_FLD_VALUE</li> <li>▪ PIN_FLD_DATA_ARRAY.PIN_FLD_VALID_FROM</li> <li>▪ PIN_FLD_DATA_ARRAY.PIN_FLD_VALID_TO</li> </ul>
/service	<ul style="list-style-type: none"> <li>▪ PIN_FLD_AAC_PROMO_CODE</li> <li>▪ PIN_FLD_AAC_VENDOR</li> <li>▪ PIN_FLD_ALIAS_LIST</li> <li>▪ PIN_FLD_ALIAS_LIST.PIN_FLD_NAME</li> <li>▪ PIN_FLD_LOGIN</li> <li>▪ PIN_FLD_STATUS</li> <li>▪ PIN_FLD_AAC_SOURCE</li> </ul>
/uniqueness	<ul style="list-style-type: none"> <li>▪ PIN_FLD_LOGIN</li> <li>▪ PIN_FLD_ALIAS_LIST.PIN_FLD_NAME</li> <li>▪ PIN_FLD_SERVICE_OBJ</li> </ul>

## Configuring Account Synchronization for Multiple Database Schemas

For an overview of how Account Synchronization works in a multischema system, see ["About Account Synchronization"](#).

To synchronize accounts in BRM and Pipeline Manager in a multischema system:

1. Set up your multischema system and create multiple instances of Pipeline Manager for each database schema.  
See ["Installing a Multischema System"](#).
2. Configure each queuing database machine for advanced queuing.  
See ["Configuring Database Machines for Advanced Queuing"](#).
3. Install the Account Synchronization DM on all systems that have the CM installed.  
See ["Installing Account Synchronization Manager"](#).

---

**Note:** You do not need to perform all the configuration steps for secondary Account Synchronization installations. For example, you do not need to configure the EAI payload, enable event notification, set up service-level items, turn on object auditing, and validate rate plans. These updates are propagated to each database schema by Multidatabase Manager.

---

4. (Optional) Create additional database queues.  
See ["Creating Additional Account Synchronization Queues"](#).
5. Grant execute permission for **acct\_sync** to your queuing database schemas so that they can forward events to queues in other schemas when necessary.  
See ["Granting Execute Permission for acct\\_sync"](#).
6. Map each instance of the DAT\_Listener module to its corresponding database queue.

See ["Configuring the DAT\\_Listener Module"](#).

7. Map the business events to each database queue in the **ifw\_sync\_queuenames** files.

See ["Mapping Business Events to Database Queues"](#).

8. Edit the configuration file (**pin.conf**) for each instance of the Account Synchronization DM.

See ["Configuring the Account Synchronization DM"](#).

9. In the registry section for the DAT\_AccountBatch module, add the **UseAsRouter** entry and set it to **True**, as in this example:

```
CustomerData
{
 ModuleName = DAT_AccountBatch
 Module
 {
 IntegrateConnection = ifw.DataPool.Login
 InfranetConnection = ifw.DataPool.LoginInfranet
 LogEvents = True
 LoadLogins = True
 Listener = ifw.DataPool.Listener
 Connections = 10
 Threads = 10
 UseAsRouter = True
 }
}
```

For more information on this parameter, see the description of the DAT\_AccountBatch module in *BRM Configuring Pipeline Rating and Discounting*.

10. In the registry section for the FCT\_AccountRouter module, map each BRM database schema identifier to an output stream, as in this example:

---

---

**Note:** You can use any names for the output streams.

---

---

```
AccountRouter
{
 ModuleName = FCT_AccountRouter
 Module
 {
 Active = True
 DataModule = ifw.DataPool.CustomerData
 Streams
 {
 1 = PinOutputStream1
 2 = PinOutputStream2
 3 = PinOutputStream3
 4 = PinOutputStream4
 5 = PinOutputStream5
 }
 }
}
```

For more information on this parameter, see the description of the FCT\_AccountRouter module in *BRM Configuring Pipeline Rating and Discounting*.



11. Configure the registry of each Pipeline Manager instance to read accounts from its associated database schema.

For example, Pipeline Manager 1 connects to database schema 1, Pipeline Manager 2 connects to database schema 2, and so on.

## Starting and Stopping the Account Synchronization DM

To start the Account Synchronization DM, enter the following command at the prompt for Oracle AQ:

```
pin_ctl start dm_ifw_sync
```

To stop the Account Synchronization DM, enter the following command at the prompt for Oracle AQ:

```
pin_ctl stop dm_ifw_sync
```

## Monitoring and Maintaining the Account Synchronization Queue

This section provides information and guidelines to help you manage your Account Synchronization queues.

The main administrative tasks for database queues are the following:

- [Creating Additional Queues](#)
- [Generating Queue Reports](#)
- [Dropping the Queue and Queue Tables](#)
- [Configuring the Queue Location](#)
- [Configuring How Often Processed Events Are Removed from the Queue](#)
- [Configuring Account Synchronization DM Database Connection Attempts](#)
- [Disconnecting and Reconnecting the Account Synchronization DM to the Queue](#)
- [Disconnecting and Reconnecting DAT\\_Listener to the Queue](#)

### Creating Additional Queues

You must create additional queues in the following situations:

- You add a new instance of Pipeline Manager to your system.
- You add a BRM database schema to your system.

To create additional queues in an existing system:

1. Stop the Account Synchronization DM.  
See ["Starting and Stopping the Account Synchronization DM"](#).
2. If necessary, configure the Oracle database for Account Synchronization.  
See ["Configuring Database Machines for Advanced Queuing"](#).
3. If you are creating your queue in a new database schema, grant execute permission for its **acct\_sync** package to your other queuing database schemas so they can forward events to the new database queue.  
See ["Granting Execute Permission for acct\\_sync"](#).
4. Create the new database queue by using **pin\_ifw\_sync\_oracle**.

See ["Creating Additional Account Synchronization Queues"](#).

5. Specify which events the Account Synchronization DM sends to the new queue.

See ["Mapping Business Events to Database Queues"](#).

6. Connect the new queue to its corresponding DAT\_Listener module.

See ["Configuring the DAT\\_Listener Module"](#).

7. Restart the Account Synchronization DM.

See ["Starting and Stopping the Account Synchronization DM"](#).

## Generating Queue Reports

You can monitor the events in your database queue by running the **pin\_ifw\_sync\_oracle** utility.

---

---

**Important:** To avoid system errors, do not run Pipeline Manager while running **pin\_ifw\_sync\_oracle**.

---

---

**pin\_ifw\_sync\_oracle** creates the following reports:

- A summary report that lists the number of events set to the READY and PROCESSED states.
- A detailed report that lists each event's ID, state, queuing time, and dequeuing time.

## Generating Oracle AQ Reports

To run a summary report for Oracle AQ, enter the following command:

```
pin_ifw_sync_oracle.pl report -r summary [-q queue_name] -l user_
name/password@database_alias
```

where:

- *queue\_name* specifies the queue name.
- *user\_name* specifies the user name for the database schema.
- *password* specifies the password for the specified user name.
- *database\_alias* specifies the BRM database alias of the database schema.

To run a detailed report for Oracle AQ, enter the following command:

```
pin_ifw_sync_oracle.pl report -r detail [-q queue_name] -l user_
name/password@database_alias
```

where:

- *queue\_name* specifies the queue name.
- *user\_name* specifies the user name for the database schema.
- *password* specifies the password for the specified user name.
- *database\_alias* specifies the BRM database alias of the database schema.

For information, see ["pin\\_ifw\\_sync\\_oracle"](#).

## Dropping the Queue and Queue Tables

To drop the queue and its queue tables, enter the following command:

---

**Important:** To avoid system errors, do not run Pipeline Manager while running `pin_ifw_sync_oracle`.

---

```
pin_ifw_sync_oracle.pl drop [-q queue_name]
```

where *queue\_name* is dropped from the database.

If the database contains no other queues for Account Synchronization, the utility also removes the Account Synchronization package, which contains stored procedures for queuing, dequeuing, and purging events.

For more information, see "[pin\\_ifw\\_sync\\_oracle](#)".

## Configuring the Queue Location

By default, the `pin_ifw_sync_oracle` utility creates Oracle database queues in the tablespace you specified when you installed Account Synchronization Manager. To use a different tablespace, see one of the following:

- [Specifying Default Storage Settings in the create\\_ifw\\_sync\\_queue.conf File](#)
- [Specifying Storage Settings by Using the pin\\_ifw\\_sync\\_oracle Utility](#)

### Specifying Default Storage Settings in the create\_ifw\_sync\_queue.conf File

You can specify the default storage settings by using the `create_ifw_sync_queue.conf` file. All database queues that you create use the default settings unless you override them with the `pin_ifw_sync_oracle` utility.

To specify your default storage settings:

1. Open the `BRM_Home/apps/pin_ifw_sync/create_ifw_sync_queue.conf` file in a text editor.
2. Specify the target tablespace and queue size by editing the `storage_clause` parameter:

---

**Tip:** For production systems, create your queue in its own, separate tablespace to improve processing performance.

---

```
$storage_clause = "tablespace PIN00 initrans 5 storage (initial 200k next 200k
maxextents unlimited pctincrease 0)";
```

3. Save and close the file.

### Specifying Storage Settings by Using the pin\_ifw\_sync\_oracle Utility

You can specify a queue's storage settings by using the `pin_ifw_sync_oracle` utility with the `-s` parameter. This option overrides the storage settings in the `create_ifw_sync_queue.conf` file.

---

**important:** To avoid system errors, do not run Pipeline Manager while running the `pin_ifw_sync_oracle` utility.

---

To specify storage settings by using the **pin\_ifw\_sync\_oracle** utility, enter the following command:

```
su - pin
pin_ifw_sync_oracle.pl create [-q queue_name -t queue_table] -s storage_clause
```

where:

- *queue\_name* specifies the queue name.
- *queue\_table* specifies the queue table name.
- *storage\_clause* specifies the queue's storage parameters.

For more information, see "[pin\\_ifw\\_sync\\_oracle](#)".

---

---

**Tip:** For production systems, create your queue in its own, separate tablespace to improve processing performance.

---

---

## Configuring How Often Processed Events Are Removed from the Queue

The Oracle queue monitor process (QMn) removes from the queue any event that has been in the PROCESSED state for a specified amount of time. You specified a default retention time when you installed Account Synchronization Manager. To use a different retention time, see one of the following:

- [Setting Default Retention Time in the create\\_ifw\\_sync\\_queue.conf File](#)
- [Setting Retention Times by Using the pin\\_ifw\\_sync\\_oracle Utility](#)

### Setting Default Retention Time in the create\_ifw\_sync\_queue.conf File

You can set the default retention time in the **create\_ifw\_sync\_queue.conf** file. All database queues that you create use this default setting unless you override it with the **pin\_ifw\_sync\_oracle** utility.

To set the default retention time in the **create\_ifw\_sync\_queue.conf** file:

1. Open the *BRM\_Home/apps/pin\_ifw\_sync/create\_ifw\_sync\_queue.conf* file in a text editor.
2. Set the **retention\_time** parameter to the amount of time, in seconds, that you want to store processed events in the database queue:

---

---

**Note:** For production systems, set the retention time to 0 to optimize your processing performance.

---

---

```
retention_time = retention_time;
```

3. Save and close the file.

### Setting Retention Times by Using the pin\_ifw\_sync\_oracle Utility

You can specify a queue's retention time by using the **pin\_ifw\_sync\_oracle** utility with the **-r** parameter. This option overrides the retention time setting in the **create\_ifw\_sync\_queue.conf** file.

---

**Important:** To avoid system errors, do not run Pipeline Manager while running **pin\_ifw\_sync\_oracle**.

---

To set the retention time by using the **pin\_ifw\_sync\_oracle** utility:

```
su - pin
pin_ifw_sync_oracle.pl create [-q queue_name -t queue_table] -r retention_time
```

where:

- *queue\_name* specifies the queue name.
- *queue\_table* specifies the queue table name.
- *retention\_time* specifies the queue's retention time, in seconds.

For more information, see "[pin\\_ifw\\_sync\\_oracle](#)".

---

**Tip:** For production systems, set the retention time to 0 to optimize your processing performance.

---

## Configuring Account Synchronization DM Database Connection Attempts

You can configure how often the Account Synchronization DM attempts to connect to the database schema that contains the Account Synchronization queue.

To configure connection attempts:

1. Open the *BRM\_Home/sys/dm\_ifw\_sync/pin.conf* file in a text editor.
2. Specify the number of times the Account Synchronization DM should try to connect to the Oracle database server by editing the **connect\_retries** entry.

The default is 1.

```
-dm_ifw_sync connect_retries number_of_retries
```

3. Specify the interval, in seconds, between each reconnection attempt by editing the **retry\_interval** entry.

The default is 0.

```
-dm_ifw_sync retry_interval interval
```

4. Save and close the file.
5. Stop and restart the Account Synchronization DM.

See "[Starting and Stopping the Account Synchronization DM](#)".

## Disconnecting and Reconnecting the Account Synchronization DM to the Queue

You can prevent the Account Synchronization DM from enqueueing business events when you tune or shut down the queuing database schema by using the **pin\_ctl** utility. See *BRM System Administrator's Guide*.

To disconnect from the queue, enter the following command:

```
pin_ctl stop dm_ifw_sync
```

To reconnect to the database queue and begin enqueueing business events, enter the following command:

```
pin_ctl start dm_ifw_sync
```

For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

## Disconnecting and Reconnecting DAT\_Listener to the Queue

You can keep Pipeline Manager online when you tune or shut down the queuing database schema by disconnecting the DAT\_Listener module from the queue. For more information, see ["About Disconnecting the Account Synchronization DM from the Queue"](#).

To disconnect the module from the database queue, enter the following semaphore file entry:

```
ifw.DataPool.Listener.Module.Disconnect{}
```

To reconnect the DAT\_Listener module to the database queue, enter the following semaphore file entry:

```
ifw.DataPool.Listener.Module.Connect{}
```

For more information about the semaphore entries, see the description of the DAT\_Listener module in *BRM Configuring Pipeline Rating and Discounting*.

## Troubleshooting Account Synchronization

If an error occurs during an account synchronization operation, check the account synchronization log file (*BRM\_Home/sys/dm\_ifw\_sync/dm\_ifw\_sync.pinlog*) for error codes. For a list of standard errors and codes, see the description of BRM error codes in *BRM System Administrator's Guide*.

### Database Queue Creation Error

To install the Account Synchronization DM and create database queues, the **pin** user must have Oracle AQ privileges. If **pin** does not have privileges, you receive the following error when you attempt to install the Account Synchronization DM or create queues with the **pin\_ifw\_sync\_oracle** utility:

```
PLS-00201 identifier 'SYS.DBMS_AQ' must be declared
```

To fix this error:

1. Using SQL\*Plus, log in to your database as the SYS user and grant advanced queuing privileges to user **pin**:

```
% sqlplus sys/password@databaseAlias
SQL> grant execute on dbms_aq to pin;
```

```
Grant succeeded.
```

```
SQL> grant execute on dbms_aqadm to pin;
```

```
Grant succeeded.
```

```
SQL> grant execute on dbms_lock to pin;
```

```
Grant succeeded.
```

2. Reinstall the Account Synchronization DM or create your queue by running the `pin_ifw_sync_oracle` utility manually.

See ["Creating Additional Account Synchronization Queues"](#).

## Interleaved Processing Errors

This section describes interleaved processing errors and their solutions.

### Missing Registry Entries

If you enable interleaved event processing in `DAT_Listener`, and you specify the event and CDR processing time entries (`MaxEventProcessTime` and `MaxCDRProcessTime`), you must also specify the entries that set the number of event thresholds (`MaxNumEvents` and `MinNumEvents`). If you do not do this, `DAT_Listener` throws a critical error (`ERR_REG_VALUE_INVALID`) during startup. However, if you update the registry by using a semaphore and the required entries are not specified, `DAT_Listener` throws a warning and disregards the semaphore update.

### Semaphore Entry Errors

When an interleaving semaphore entry contains an error, the pipelines are deactivated.

The following interleaving semaphore errors cause the pipelines to be deactivated:

- The values for `MinNumEvents` and `MaxNumEvents` are not numbers.
- `MinNumEvents` is less than `MaxNumEvents`.
- The values for `MaxEventProcessTime` and `MaxCDRProcessTime` are not numbers.
- `CheckInterval` is not a number.

To reactivate the pipelines, use the **Active** semaphore. For example:

```
ifw.Pipelines.PRE_PROCESS.Active=TRUE
ifw.Pipelines.PRE_RECYCLE.Active=TRUE
ifw.Pipelines.ALL_RATE.Active=TRUE
```

After the pipelines are reactivated, reissue the interleaving semaphore using the correct values.

## Modifying Business Events before Sending Them to Pipeline Manager

You can modify the BRM events that make up a business event before the business event is sent to the Account Synchronization DM for publishing to Pipeline Manager. You do this by customizing the Account Synchronization policy opcode, `PCM_OP_IFW_SYNC_POL_PUBLISH_EVENT`. See *BRM Developer's Reference*.

---

**Note:** Customizing the policy opcode requires programming knowledge and should be performed only by a developer.

---

You might want to modify an event to filter out unneeded data, which can improve performance if you publish large quantities of events. You can also use a flag to specify how adjustments should be applied to the account balance; for example, to permit the account to have a negative balance. For more information, see the description of the `PCM_OP_IFW_SYNC_POL_PUBLISH_EVENT` policy opcode in *BRM Developer's Reference*.

To modify a business event before sending it to Pipeline Manager:

1. Ensure that all the BRM events that make up the business event are associated with opcode number 3626 (PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT) in your system's event notification list.  
See ["Configuring Event Notification for Account Synchronization"](#).
2. Use PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT to process the BRM events that make up the business event.  
See ["Processing BRM Events That Make Up Account Synchronization Business Events"](#).
3. Use the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode to customize the BRM events that make up the business event.  
See ["Modifying BRM Events That Make Up Account Synchronization Business Events"](#).

## Processing BRM Events That Make Up Account Synchronization Business Events

PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT passes BRM events that make up Account Synchronization business events to the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode for modification.

PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT is called by the event notification feature when an event associated with this opcode in your system's event notification list occurs. See ["Configuring Event Notification for Account Synchronization"](#).

By default, PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT does not modify events; it only passes them to the policy opcode.

If the BRM event is published in the business event, PCM\_OP\_IFW\_SYNC\_PUBLISH\_EVENT returns one of two POIDs:

- If the object passed in was an **/event** type object, the event POID is returned.
- If the object passed in was *not* an **/event** type object, a POID of type **/publish** is returned.

If the BRM event is not published (for example, if you filter out the event based on your business logic), the input flist is returned.

## Modifying BRM Events That Make Up Account Synchronization Business Events

You can customize the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode to remove or enhance BRM events and event fields before they are assembled into business events and sent to Pipeline Manager. For example, you can customize this opcode to:

- Filter out BRM events that you do not want to include in published business events for various business or performance reasons.

---

---

### Important:

- Do not filter out balance impact fields based on the resource ID. If you do, you might remove fields needed by Pipeline Manager.
  - Do not modify the code that prepares the login fields (the **fm\_ifw\_sync\_pol\_prep\_logins** function). This code is required when a login is changed.
- 
-



- Modify the value of the PIN\_FLD\_FLAGS field that is added to PIN\_FLD\_BAL\_IMPACT arrays. This field specifies how to apply adjustments. For example, you can permit a negative balance by specifying a value of 4. By permitting a negative balance, the negative amount will be deducted from the account balance with the next billing cycle.

You might use this method, for example, when a customer purchases a service that includes 60 free minutes per month and cancels the service before the end of the month. If the customer has used all 60 minutes, but you prorate the free minutes, the amount of usage for the canceled period can be deducted with the next billing cycle (provided the customer has a positive balance at that time).

By default, the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode modifies the following BRM events listed in [Table 22-4](#):

**Table 22-4 BRM Events Modified by PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT**

Event	Action
/event/billing/debit	<p>Adds a PIN_FLD_FLAGS field to each PIN_FLD_BAL_IMPACT array. This field indicates how adjustments should be applied:</p> <ul style="list-style-type: none"> <li>■ 1 applies the entire adjustment to the current month. This flag is the default for cycle forward events.</li> <li>■ 2 applies an adjustment over a period of months.</li> </ul> <p><b>Note:</b> This flag value is not implemented.</p> <ul style="list-style-type: none"> <li>■ 4 permits a negative account balance. Use this flag when you want to specify a negative balance for resources, such as when prorating free minutes. If this field is not set, any balance that results in a negative value is removed.</li> <li>■ To specify more than one option, sum the values. For example, to apply the entire adjustment to the current month (1) and allow a negative balance (4), set this flag to 5.</li> </ul>
/event/billing/product/fee/cycle/*	<p>Filters out these event types after the first occurrence. These events are generated when a product is purchased and when billing is run. For product purchase, Pipeline Manager must be notified so it can update the in-memory account data. However, for billing, Pipeline Manager performs the account balance update and does not need this event passed in.</p>
/event/billing/sub_bal_validity	<p>Creates a PIN_FLD_SUB_BAL_IMPACTS array in the event. PCM_OP_IFW_SYNC_POL_PUBLISH_EVENT populates this array with information from element 1 of the existing PIN_FLD_SUB_BAL_AUDIT array for the event. Element 1 stores the updated validity period and the resource and balance group associated with the sub-balance.</p> <p>Adding PIN_FLD_SUB_BAL_IMPACTS with the new validity period enables the DAT_BalanceBatch module to dynamically update the rating basis.</p>
/event/customer/login	<p>Copies PIN_FLD_SERVICE_OBJ from the top level of the input flist into the new login field (element 1) in the PIN_FLD_LOGINS array. This ensures that Pipeline Manager knows which service is associated with the new login.</p>

If the BRM event is published in the business event, the PCM\_OP\_IFW\_SYNC\_POL\_PUBLISH\_EVENT policy opcode returns one of the following POIDs:

- If the object passed in was an **/event** type, the event POID is returned.
- If the object passed in was *not* an **/event** type object, a POID of type **/publish** is returned.

If the BRM event is not published (for example, if you filter out the event based on your business logic), the input flist is returned.

## Manually Configuring Object Auditing

To enable BRM to audit GSM objects, run the **object\_auditing.pl** script. For more information, see ["Turning On Object Auditing"](#).

The **object\_auditing.pl** script performs a series of steps that can also be performed manually. This section describes these manual steps.

To manually configure object auditing:

- Modify the DM configuration file (**pin.conf**) and run the **pin\_history\_on** utility.  
See ["Running the pin\\_history\\_on Utility"](#).
- Modify the **create\_indexes\_audit\_tables\_oracle.source** file and create the audit table indexes.  
See ["Creating Audit Table Indexes"](#).

### Running the pin\_history\_on Utility

---

---

**Caution:**

- When installing wireless managers such as Account Synchronization Manager or GSM Manager, you must install *all* managers *before* running this utility. If you run this utility before installing a wireless manager, your installation will fail.
  - If you are using a multischema system, do the following:
    1. Install all wireless managers.
    2. Install your multischema system.
    3. Run the **pin\_history\_on** utility.
- 
- 

---

---

**Important:**

- The **pin\_history\_on** utility requires a **pin.conf** configuration file. You can create one (see the description of creating configuration files in *BRM System Administrator's Guide*), or you can run the script from a directory that contains a **pin.conf** file, such as **BRM\_Home/sys/dm\_ifw\_sync**.
  - Before running this utility, you must manually modify entries in the Oracle DM configuration file to give the DM write permission so that the objects in the input file can be written to the database. After running the utility, you restore the entries in the configuration file to their original values.
- 
- 

To run the **pin\_history\_on** utility:

1. Open the **BRM\_Home/sys/dm\_oracle/pin.conf** file in a text editor.
2. Note the value of the following entries:

---

```
- dm dd_write_enable_fields
- dm dd_write_enable_objects
- dm dd_write_enable_portal_objects
- dm dd_mark_as_portal
```

**3.** Set the values of the following entries to **1**.

```
- dm dd_write_enable_fields 1
- dm dd_write_enable_objects 1
- dm dd_write_enable_portal_objects 1
- dm dd_mark_as_portal 1
```

---

**Note:** If an entry is not in the file, add it.

---

- 4.** Save and close the file.
- 5.** Stop and restart the Oracle DM.
- 6.** Run the **pin\_history\_on** utility:

```
pin_history_on pin_history_on_input
```

---

**Note:** If you run the utility from another directory, include the path to the **pin\_history\_on** utility in the command line. For example:

```
pin_history_on BRM_Home/bin/pin_history_on_input
```

---

For more information, see "[pin\\_history\\_on](#)".

- 7.** Open the *BRM\_Home/sys/dm\_oracle/pin.conf* file in a text editor.
- 8.** Restore the following entries to their original values (the values they had before you modified them):

```
- dm dd_write_enable_fields
- dm dd_write_enable_objects
- dm dd_write_enable_portal_objects
- dm dd_mark_as_portal
```

- 9.** Save and close the file.
- 10.** Stop and restart the Oracle DM.

## Creating Audit Table Indexes

After running the **pin\_history\_on** utility, you must create indexes for the new audit tables.

The Account Synchronization installation installs a file (**create\_indexes\_audit\_tables\_oracle.source**) that specifies the necessary indexes on the audit tables.

1. Open the *BRM\_Home/sys/dd/data/create\_indexes\_audit\_tables\_oracle.source* file in a text editor.
2. Set the `$PIN_CONF_TBLSPACEX1` entry to **pinx00**.

---

**Note:** This entry must have the same value as the variable `$MAIN_DB{'indexes_group'}` configured in the *BRM\_Home/setup/pin\_setup.values* file. The default value of this entry is **pinx00**.

---

3. Set the \$PIN\_CONF\_STORAGE\_MED entry to the following:  
**storage (initial 200k next 200k maxextents unlimited pctincrease 0)**
4. Save and close the file.
5. Create the audit table indexes in SQL\*Plus by running the following command:

```
sqlplus user/password@database_Alias @filepath/create_indexes_audit_tables_
oracle.source
```

---

## Account Synchronization Installation Utilities

This chapter provides reference information for Oracle Communications Billing and Revenue Management (BRM) Account Synchronization installation utilities.

## object\_auditing

Use this utility to enable object auditing when using the Oracle database.

---

**Caution:**

- When installing wireless managers such as Account Synchronization Manager or GSM Manager, you must install *all* managers *before* running this utility. If you run this utility before installing a wireless manager, your installation will fail.
  - If you are using a BRM multischema system, you must install all wireless managers, then install your multischema system, and then run the **object\_auditing.pl** utility, in that order.
- 

For more information about auditing, see "About Tracking Changes to Object Fields" in *BRM Developer's Guide*.

The **object\_auditing.pl** script turns on object auditing by invoking the **pin\_history\_on** utility with the **-v** and **pin\_history\_on\_input** input file parameters to turn on object auditing. The script then creates the specified audit table indexes by using the **create\_indexes\_audit\_tables\_oracle.source** file.

You define which objects are audited by editing the **pin\_history\_on\_input** file (*BRM\_Home/apps/integrate\_sync/pin\_history\_on\_input*) before running this utility to load the file.

You customize the audit table indexes by editing the **create\_indexes\_audit\_tables\_oracle.source** file (*BRM\_Home/sys/dd/data/create\_indexes\_audit\_tables\_oracle.source*).

For more information, see "[Turning On Object Auditing](#)".

---

**Note:** To connect to the BRM database, the **object\_auditing** script 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*.

---

### Location

*BRM\_Home/setup/scripts*

### Syntax

```
perl object_auditing
```

### Results

Look in the utility log file (**default.pinlog**) to find any errors. The log file is either in the directory from which the utility was started, or in a directory specified in the configuration file.

## pin\_history\_on

Use this utility to enable object auditing when using the Oracle database.

Use the **object\_auditing.pl** script to run this utility after installing all your wireless managers. See "[object\\_auditing](#)".

---

### Caution:

- When installing wireless managers such as Account Synchronization Manager or GSM Manager, you must install *all* managers *before* running this utility. If you run this utility before installing any wireless manager, your installation will fail.
  - If you are using a multischema system, you must install all wireless managers, then install your multischema system, and then run the **pin\_history\_on** utility, in that order only.
- 

If you choose to run this utility independently (not as part of the **object\_auditing** script), you must also perform these tasks:

- Manually modify entries in the Oracle DM configuration file to give the DM permission to write the objects in the input file to the database.
- Create audit table indexes for the objects that you audit.

For more information, see "[Manually Configuring Object Auditing](#)".

For more information about auditing, see "About Tracking Changes to Object Fields" in *BRM Developer's Guide*.

You define which objects are audited by editing the **pin\_history\_on\_input** file and running this utility to load the file. For more information, see "[Turning On Object Auditing](#)".

---

**Note:** To connect to the BRM database, the **pin\_history\_on** 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*.

---

### Location

*BRM\_Home/bin*

### Syntax

```
pin_history_on [-d | -v | -h] pin_history_on_input
```

### Parameters

**-d**

Enables debugging mode.

**-v**

Displays information about successful or failed processing as the utility runs.

---

---

**Note:** This parameter is always used with other parameters and commands. It is not position dependent. For example, you can enter **-v** at the beginning or end of a command to initiate the verbose parameter. To redirect the output to a log file, use the following syntax with the verbose parameter. Replace *filename.log* with the name of the log file:

**pin\_history\_on** *any\_other\_parameter* **-v>** *filename.log*

---

---

**-h**

Displays the syntax and parameters for this utility.

**pin\_history\_on\_input**

Name of the file that specifies which fields within the objects to audit. A sample file is included in the *BRM\_Home/apps/integrate\_sync* directory

## Results

Look in the utility log file (**default.pinlog**) to find any errors. The log file is either in the directory from which the utility was started, or in a directory specified in the configuration file.



## pin\_ifw\_sync\_oracle

Use this utility to create, drop, and monitor Account Synchronization queues in your Pipeline Manager database.

The Account Synchronization DM uses these queues to send BRM business events to the Pipeline Manager Listener (DAT\_Listener) module. See "[About Sending Account Data to Pipeline Manager](#)".

### Location

*BRM\_Home/apps/pin\_ifw\_sync*

### Syntax Overview

The following actions are supported for Pipeline Manager databases:

- [Syntax for Creating a Queue](#)
- [Syntax for Dropping a Queue](#)
- [Syntax for Generating a Report](#)
- [Syntax for Testing a Queue](#)
- [Syntax for Listing Queues](#)
- [Syntax for Getting Help](#)

### Syntax for Creating a Queue

Creates an Account Synchronization queue, queue table, and database package in your database. The database package contains stored procedures for queuing, dequeuing, and purging business events.

```
pin_ifw_sync_oracle.pl create
 [-l username/password@DatabaseAlias]
 [-q queue_name -t queue_table]
 [-s] storage_clause
 [-r retention_time]
```

### Parameters for Creating a Queue

**-l username/password@ DatabaseAlias**

Specifies how to connect to the database.

For example:

```
pin_ifw_sync_oracle.pl create -l pin/password@pindb.portal.com
```

If you omit this parameter, the utility prompts you for this information.

**-q queue\_name -t queue\_table**

Specifies the queue name and queue table name.

If you omit these parameters, the utility automatically creates a queue named IFW\_SYNC\_QUEUE and a queue table named IFW\_SYNC.

**-s storage\_clause**

Specifies the storage settings for the queue table.

If you omit this parameter, the storage settings are set by the **storage\_clause** parameter in the *BRM\_Home/apps/pin\_ifw\_sync/create\_ifw\_sync\_queue.conf* file. See ["Configuring the Queue Location"](#).

For example:

```
pin_ifw_sync_oracle.pl create -s "tablespace PIN00 initrans 5 storage (initial
200k next 200k maxextents unlimited pctincrease 0)"
```

**-r retention\_time**

Specifies the amount of time, in seconds, until processed events are removed from the database queue.

If you omit this parameter, the retention time is set by the **retention\_time** parameter in the *BRM\_Home/apps/pin\_ifw\_sync/create\_ifw\_sync\_queue.conf* file. See ["Configuring How Often Processed Events Are Removed from the Queue"](#).

## Syntax for Dropping a Queue

Drops the specified queue and its associated queue table from your database. If the database contains no other Account Synchronization queues, this command also drops the Account Synchronization database package, which contains stored procedures for queuing, dequeuing, and purging events.

```
pin_ifw_sync_oracle.pl drop [-q queue_name] [-l username/password@DatabaseAlias]
```

## Parameters for Dropping a Queue

**-q queue\_name**

Specifies the name of the queue to drop.

If you omit this option, the utility automatically drops the default queue, IFW\_SYNC\_QUEUE.

**-l username/password@DatabaseAlias**

Specifies how to connect to the database.

If you omit this option, the utility prompts you for this information.

## Syntax for Generating a Report

Generates a report that displays the state of each event in an Account Synchronization queue.

```
pin_ifw_sync_oracle.pl report -r summary|detail [-q queue_name]
[-l username/password@DatabaseAlias]
```

## Parameters for Generating a Report

**-r summary | detail**

Generates the specified type of report.

- **-r summary** generates a report that summarizes the number of events in each state. Events can be in the following states shown in [Table 23-1](#):

**Table 23-1 Pipeline Manager Event States**

State	Description
READY	The event has not been dequeued or processed by Pipeline Manager.

**Table 23–1 (Cont.) Pipeline Manager Event States**

State	Description
PROCESSED	The event was dequeued and processed by Pipeline Manager.

- **-r detail** generates a report that details the ID, event state, queuing time, and dequeuing time for each event.

**-q queue\_name**

Specifies the queue name.

If you omit this parameter, the utility automatically generates a report for the default queue, IFW\_SYNC\_QUEUE.

**-l username/password@DatabaseAlias**

Specifies how to connect to the database.

If you omit this parameter, the utility prompts you for this information.

**Syntax for Testing a Queue**

Tests the specified queue by attempting to enqueue and dequeue 20 test events. You run this command to test if a newly created queue functions properly.

---

---

**Note:** You need to test a queue only after it is first created.

---

---

```
pin_ifw_sync_oracle.pl test [-q queue_name]
 [-l username/password@DatabaseAlias]
```

**Parameters for Testing a Queue****-q queue\_name**

Specifies the queue name.

If you omit this parameter, the utility automatically tests the default queue, IFW\_SYNC\_QUEUE, and default queue table, IFW\_SYNC.

**-l username/password@DatabaseAlias**

Specifies how to connect to the database.

If you omit this parameter, the utility prompts you for this information.

**Syntax for Listing Queues**

Lists all queues in the current user's database.

```
pin_ifw_sync_oracle.pl list [-l username/password@DatabaseAlias]
```

**Parameters for Listing Queues****-l username/password@DatabaseAlias**

Specifies how to connect to the database.

If you omit this parameter, the utility prompts you for this information.

## Syntax for Getting Help

Displays the syntax for the **pin\_ifw\_sync\_oracle** utility.

```
pin_ifw_sync_oracle.pl help
```

## Results

The **pin\_ifw\_sync\_oracle** utility notifies you when it runs successfully. 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.