Oracle® Communications Billing and Revenue Management

Designing and Generating Invoices

Release 7.5

E16707-15

December 2019

ORACLE®

Oracle Communications Billing and Revenue Management Designing and Generating Invoices, Release 7.5

E16707-15

Copyright © 2011, 2019, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, then the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information about content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services unless otherwise set forth in an applicable agreement between you and Oracle. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services, except as set forth in an applicable agreement between you and Oracle.

Contents

Preface xi

Audience xi
Accessing Oracle Communications Documentation xi
Documentation Accessibility xi
Document Revision History xi

1 Designing and Generating Invoices

About Invoices 1-1
BRM Invoice Features 1-2
About the Invoicing Process 1-2
About Invoicing for Hierarchical Account Groups 1-3
About Viewing Invoices for Subordinate Accounts 1-4
About Brand-Specific Invoices 1-4
About Localized Invoices 1-4
Defining the Invoice Type 1-4
Defining Multiple Invoices for One Customer 1-5
Designing Invoice Templates 1-6
Using XSLT Invoice Templates 1-6
Turning on XSLT Style Sheet Processing 1-7
Using an XSLT Processor Other Than the Xalan XSLT Processor 1-7
Using HTML Invoice Templates 1-7
Using Hyperlinked Invoice Templates 1-8
Loading Stored Procedures for Hyperlinked Invoice Templates Reports 1-8
Setting Up the Data Model for Hyperlinked Invoice Templates 1-9
Setting Up the Hyperlinked Invoice Templates 1-9
Modifying the Hyperlink Path Prefix 1-11
Loading Invoice Templates 1-11
Disabling the Default HTML Template 1-12
Switching between XSLT and HTML Templates 1-13
How Invoices Are Formatted 1-13
Generating Invoices 1-13
Generating Invoices Automatically 1-14
Generating Invoices Manually 1-14
Generating Detailed Invoices from an External File 1-15
Generating Invoices for Non-Invoice Payment Methods 1-15

Improving Performance When Generating Invoices 1-16
Specifying Event Fields to Cache for Invoicing 1-16
Decoding Cached Event Data for Invoicing 1-18
How Invoices Are Generated 1-18
How PCM_OP_INV_MAKE_INVOICE Works 1-19
Customizing Invoice Search Operations 1-20
Creating Custom Search Templates 1-21
Example: Generating Invoices Based on Event Types 1-22
Configuring Error Checking for Customized Invoicing 1-22
Improving Performance by Removing Invoice Details You Do Not Need 1-23
Customizing the Information Included in Invoices 1-24
Customizing the Layout of Bill Items in Invoices 1-24
Creating Service-Centric Invoices 1-25
Including Payment, A/R, and Taxation Details in Invoices 1-25
Including Invoice Event Details 1-25
Including the Time Zone in Invoices 1-27
Including Shadow Event Adjustment Details in Invoices 1-28
Including Soft Descriptors in Invoices 1-28
Customizing the Policy Source File for Soft Descriptors 1-29
Including Custom Data in Invoices 1-30
Including Late Payment Fees in Invoices 1-31
Including Finance Charges in Invoices 1-31
Aggregating Taxes on Invoices 1-32
Specifying Invoice Data from Pipeline Manager and Custom Applications 1-33
Using Data Map Templates 1-33
Loading the Invoice Data Map Templates 1-34
Enabling Event Caching 1-35
Adding Invoice Data to Pipeline Output 1-35
About Formats for Storing Invoices 1-35
Storing Invoices in a Separate Database Schema 1-36
Installing the Invoice Data Manager 1-36
Configuring BRM to Use a Separate Invoice Database Schema 1-38
Configuring Invoice Applications to Use a Separate Invoice Database Schema 1-38
Starting the Invoice Data Manager 1-39
Configuring the Invoice pin.conf for Multiple Database Schemas 1-39
Displaying Invoices 1-39
Using Web Pages 1-39
Using the XML Sample Invoice Viewing Utility 1-40
Customizing the Format for Online Invoices 1-40
Customizing the Format for Printed Invoices 1-40
Customizing the Format for HTML Invoices 1-41
Customizing the Format for XML Invoices 1-41
Customizing the Invoice Format by Using an XSL Style Sheet 1-41
Customizing the Format for DOC1 Invoices 1-41
Displaying an Invoice on Demand 1-42
Understanding Invoice Layout 1-42
Standard Details 1-43

Adjustment, Payment, Promotion, and Other Charges and Credits Details 1-44
Charge Details 1-45
Sending Invoices to Customers 1-47
Setting the Maximum Invoice Size for Email 1-47
Sending Child Account Invoices to the Parent Account's Email Address 1-47
Configuring the Email Data Manager for Printing 1-47
Sending Invoices to Accounts That Use the Invoice Payment Method 1-48
Sending Invoices to Accounts That Do Not Use the Invoice Payment Method 1-48
Exporting Invoices 1-49
Setting Invoicing Defaults 1-50
Setting the Default Payment Due Date 1-51
Setting the Default Invoice Type 1-51
Setting Defaults for Hierarchical Group Invoices 1-51
Setting the Maximum Size of Invoices Viewable in Customer Center 1-52
Setting the Maximum Number of Items in the Search Template 1-53
Adding Siebel CRM Promotion Names to Invoices 1-54
How BRM Adds Siebel CRM Promotion Names 1-55
Setting Up BRM Invoices to Display Siebel CRM Promotion Names 1-55
Specifying Whether BRM Displays Promotion Details on Invoices 1-55
Managing Promotions with Siebel CRM 1-56
Using Invoice Templates That Display Promotion Names 1-58
Setting Up Invoicing on Multiple Database Schemas 1-59
Running Invoicing on Multiple Database Schemas One at a Time 1-59
Running Invoicing on Multiple Database Schemas Simultaneously 1-59
Using an /invoice Subclass 1-60

2 Corrective Invoicing

About Corrective Invoices 2-1
Types of Corrective Invoices 2-1
Contents of Replacement Invoices and Invoice Correction Letters 2-1
About Invoices and Billing Periods 2-2
Processing Payments after Issuing a Corrective Invoice 2-2
About Replacement Invoices for an Account Hierarchy 2-2
Detailed Replacement Invoice for a Parent Bill 2-2
Summary Replacement Invoice for a Parent Bill 2-3
Detailed Replacement Invoice for a Subordinate Bill 2-3
Summary Replacement Invoice for a Subordinate Bill 2-3
About Invoice Correction Letters for an Account Hierarchy 2-3
Detailed Invoice Correction Letter for a Parent Bill 2-3
Summary Invoice Correction Letter for a Parent Bill 2-4
Detailed Invoice Correction Letter for Subordinate Accounts 2-4
Summary Invoice Correction Letter for Subordinate Accounts 2-4
How BRM Displays Manual Adjustments 2-5
About Generating Corrective Invoices 2-5
About the pin_inv_accts Utility Parameters 2-5
About Corrective Invoice Templates 2-6
Configuring Corrective Invoice Templates Based on Business Profiles 2-6

Providing Custom Templates for Corrective Invoices 2-7
About Corrective Invoices and Collections 2-7
Corrective Invoices and General Ledger Posts 2-8
Setting Up Corrective Invoicing in BRM 2-8
Specifying the Type of Corrective Invoice 2-8
Providing Custom Templates for Corrective Invoices 2-8
Generating Corrective Invoices 2-9
Post-Processing Actions 2-9
Viewing Corrective Invoices 2-10

3 Designing and Generating Invoices in Oracle Business Intelligence Publisher 11*g*

About BRM Integration with BI Publisher for Invoicing 3-1
Overview of BRM and BI Publisher Invoice Generation 3-2
About the Invoicing Process 3-3
About Associating Bill Units with a BI Publisher Invoice and Report 3-3
About BRM-Business Intelligence Publisher Invoicing Integration Package Components 3-4
Designing Invoices 3-4
About Invoice Layout Templates for Invoice Document Generation 3-5
Default Templates for Regular Invoices 3-5
Default Templates for Replacement Invoices 3-5
Default Templates for Invoice Correction Letters 3-5
Report File for Default Invoice Templates 3-5
About BI Publisher Reports for Invoice Document Generation 3-6
Setting Up Your System to Generate Invoice Documents Using BI Publisher 3-6
Specifying BI Publisher Invoice Report and Template Names in BRM 3-6
Enabling the BRM-BI Publisher Integration 3-7
Creating Bill Unit Validation Templates for Invoices 3-8
Specifying the BI Publisher Report and Template 3-9
Loading Invoicing Business Profiles into the Database 3-10
Associating Pre-Existing Bill Units with Business Profiles 3-10
About the /associated_bus_profile Object 3-11
Creating /associated_bus_profile Objects 3-11
Viewing Invoices Individually on the BI Publisher Console 3-11
Enabling the Display of Customer Details on the Web 3-12
Creating /associated_bus_profile Objects for Accounts in a Branded Environment 3-12
Creating Reports for Accounts in a Branded Environment in BI Publisher 3-13
Installing BRM-BI Publisher Invoicing Integration Package 3-14
Pre-Installation Requirements 3-14
Removing Older BRM-BI Publisher 11*g* Invoicing Integration Layout Template Files 3-15
Enabling the BRM-BI Publisher Invoicing Integration Package Application 3-15
Installed Files 3-16
Upgrading Existing Reports from BI Publisher 10*g* to BI Publisher 11*g* 3-18
Configuring the pin_inv_doc_gen Utility 3-18
Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11*g* 3-19
Configuring the docgen.sh File 3-21
Changing Command-Line Parameters for pin_inv_doc_gen 3-21

Setting Scheduler Configuration ... 3-22
Configuring the Email Server ... 3-22
Configuring HTTPS for Secure Communication ... 3-22
Creating the XMLP_INVOICE_JOB Table in the Scheduler Database ... 3-22
Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems ... 3-23
Loading Stored Procedures ... 3-23
Creating New JDBC Data Sources ... 3-24
Creating Data Source for Each BRM Schema ... 3-24
Setting Up the Data Model Configuration for Multischema ... 3-24
Generating BI Publisher Invoice Documents in BI Publisher 11*g* ... 3-25
Generating BI Publisher Invoice Documents for a List of Accounts ... 3-25
Generating BI Publisher Invoice Documents Based on the Account Type ... 3-26
Generating Duplicate Invoice Documents with BI Publisher 11*g* ... 3-27
Generating Invoice Documents for Non-Invoice Accounts ... 3-27
Generating Invoices for Hierarchical Accounts with BI Publisher 11*g* ... 3-28
How Trial Invoicing Works for Hierarchical Accounts in BI Publisher 11*g* ... 3-28
Setting Up Invoicing for Hierarchical Accounts with BI Publisher 11*g* ... 3-29
Invoice Template for Hierarchical Accounts ... 3-30
Setting Subordinate Account Processing in BI Publisher 11*g* and BRM for Hierarchical Accounts 3-30
Creating Hierarchical Account Trial Invoices with BI Publisher 11*g* ... 3-31
Creating Hierarchical Account Regular Invoices with BI Publisher 11*g* ... 3-32
Regenerating Failed Invoices for Hierarchical Accounts ... 3-32
Purging Trial Invoices ... 3-33
Deferred Taxation Limitations for Hierarchical Accounts ... 3-33
Trouble Shooting Issues with Hierarchical Account Invoice Generation ... 3-34
Storing the Invoice Document ... 3-35
Sending Invoice Documents to the Customers ... 3-35
Customizing Invoices ... 3-35
Customizing Invoice Layout Templates ... 3-36
Updating the Invoice Layout Template File ... 3-36
Adding a New Invoice Layout Template ... 3-36
Enriching Invoice Data ... 3-36
Specifying the Default Format in Which to Store Invoices in BRM ... 3-37

4 Designing and Generating Invoices in Oracle Business Intelligence Publisher 10*g*

About BRM Integration with BI Publisher for Invoicing ... 4-1
Overview of BRM and BI Publisher Invoice Generation ... 4-1
About the Invoicing Process ... 4-2
About Associating Bill Units with a BI Publisher Invoice and Report ... 4-3
About BRM-Business Intelligence Publisher Invoicing Integration Package Components ... 4-4
Designing Invoices ... 4-4
About Invoice Layout Templates for Invoice Document Generation ... 4-5
Default Templates for Regular Invoices ... 4-5
Default Templates for Replacement Invoices ... 4-5

Default Templates for Invoice Correction Letters 4-5
About BI Publisher Reports for Invoice Document Generation 4-6
Setting Up Your System to Generate Invoice Documents Using BI Publisher 4-6
Specifying BI Publisher Invoice Report and Template Names in BRM 4-7
Enabling the BRM-BI Publisher Integration 4-7
Creating Bill Unit Validation Templates for Invoices 4-8
Specifying the BI Publisher Report and Template 4-9
Loading Invoicing Business Profiles into the Database 4-10
Associating Pre-Existing Bill Units with Business Profiles 4-10
About the /associated_bus_profile Object 4-11
Creating /associated_bus_profile Objects 4-12
Creating /associated_bus_profile Objects for Accounts in a Branded Environment 4-12
Creating Reports for Accounts in a Branded Environment in BI Publisher 4-13
Installing BRM-BI Publisher Invoicing Integration Package 4-14
Windows Installation 4-14
Pre-Installation Requirements 4-14
Setting the BI Publisher System Environment Variable 4-14
Installing the BRM-BI Publisher Invoicing Integration Package Application 4-15
Setting the LD_LIBRARY_PATH Environment Variable 4-15
Linux Installation 4-15
Pre-Installation Requirements 4-15
Enabling the BRM-BI Publisher Invoicing Integration Package Application 4-15
Setting the LD_LIBRARY_PATH Environment Variable 4-16
Installed Files 4-16
Configuring the pin_inv_doc_gen Utility 4-18
Configuring the Infranet.properties File for pin_inv_doc_gen 4-18
Specifying the Utility Output Format 4-19
Configuring the BipEnv.bat File 4-20
Changing Command-Line Parameters for pin_inv_doc_gen 4-20
Setting Scheduler Configuration 4-20
Configuring the Email Server 4-20
Creating the XMLP_INVOICE_JOB Table in the Scheduler Database 4-21
Deploying the BRM Web Service 4-21
Creating Shared Library in OC4J Server 4-23
Testing the Newly Deployed Web Service 4-23
Configuring How PublicBRMfetchInvoiceXMLService Connects to the BRM Database 4-24
Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems 4-24
Configuring the Connection Pool and the Data Source 4-24
Adding JNDI Entries in the Infranet.properties File of pin_inv_doc_gen 4-26
Generating BI Publisher Invoice Documents 4-27
Generating BI Publisher Invoice Documents for a List of Accounts 4-27
Generating BI Publisher Invoice Documents Based on the Account Type 4-28
Generating Duplicate BI Publisher Invoice Documents 4-28
Regenerating BI Publisher Invoice Documents 4-29
Storing the Invoice Document 4-30
Sending Invoice Documents to the Customers 4-30
Customizing Invoices 4-30

Customizing Invoice Layout Templates 4-30
Updating the Invoice Layout Template File 4-30
Adding a New Invoice Layout Template 4-30
Enriching Invoice Data 4-31
Example: Enriching Invoice Data 4-31
Specifying the Default Format in Which to Store Invoices in BRM 4-32

5 Examples of Invoices

Invoice Correction Letter in Summary Format 5-1
Regular Invoice 5-1
Invoice Correction Letter 5-3
Replacement Invoice in Detail Format 5-6
Regular Invoice 5-6
Corrective Invoice as a Replacement Invoice 5-8

6 Invoice Utilities

load_pin_invoice_data_map 6-2
pin_inv_accts 6-4
pin_inv_doc_gen 6-9
pin_inv_export 6-12
pin_inv_send 6-14
pin_load_invoice_events 6-17
pin_load_invoice_template 6-19
pin_upd_assoc_bus_profile 6-21

Preface

This document provides an overview of the Oracle Communications Billing and Revenue Management (BRM) invoicing software, including designing and generating invoices, correcting invoicing, and so on.

Audience

This document is intended for system administrators and developers involved in invoicing.

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:

https://edelivery.oracle.com

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Document Revision History

The following table lists the revision history for this book.

Version	Date	Description
E16707-01	November 2011	Initial release.

Version	Date	Description
E16707-02	May 2012	Documentation updates for BRM 7.5 Patch Set 1. ■ Made minor formatting and text changes.
E16707-03	August 2012	Documentation updates for BRM 7.5 Patch Set 2. ■ Added documentation for "Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems".
E16707-04	March 2013	Documentation updates for BRM 7.5 Patch Set 4. ■ Added "Designing and Generating Invoices in Oracle Business Intelligence Publisher 11g" chapter. ■ Replaced multischema information with multidatabase information.
E16707-05	July 2013	Documentation updates for BRM 7.5 Patch Set 5. ■ Made minor formatting and text changes. ■ Updated "Designing and Generating Invoices in Oracle Business Intelligence Publisher 11g" and "Invoice Utilities" chapters.
E16707-06	October 2013	Documentation updates for BRM 7.5 Patch Set 6. ■ Made minor formatting and text changes. ■ Added "Enabling the Display of Customer Details on the Web".
E16707-07	August 2014	Documentation updates for BRM 7.5 Patch Set 9. ■ Made minor formatting and text changes. ■ Added "Generating Invoices for Hierarchical Accounts with BI Publisher 11g" section. ■ In the "Sending Invoices to Accounts That Do Not Use the Invoice Payment Method" section, added SEPA to the Payment Method IDs table. ■ In the "pin_inv_accts" utility section, updated the **pay_type** parameter description to include SEPA. ■ In the "pin_inv_send" utility section, updated the **pay_type** parameter description to include SEPA.
E16707-08	October 2014	Documentation updates for BRM 7.5 Patch Set 10. ■ Updated the "Installing BRM-BI Publisher Invoicing Integration Package" section.
E16707-09	January 2015	Documentation updates for BRM 7.5 Patch Set 11. ■ Added "Using Hyperlinked Invoice Templates".
E16707-10	June 2015	Documentation updates for BRM 7.5 Patch Set 12. ■ Updated the "Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11g" section. ■ Made minor formatting and text changes.
E16707-11	August 2015	Documentation updates for BRM 7.5 Maintenance Patch Set 1. ■ Updated the "Installing the Invoice Data Manager" section.

Version	Date	Description
E16707-12	April 2016	Documentation updates for BRM 7.5 Patch Set 15. ▪ Updated the following sections: Generating Corrective Invoices About BI Publisher Reports for Invoice Document Generation pin_inv_accts
E16707-13	August 2016	Documentation updates for BRM 7.5 Patch Set 16. ▪ Updated the following sections: Specifying Event Fields to Cache for Invoicing Decoding Cached Event Data for Invoicing Using an XSLT Processor Other Than the Xalan XSLT Processor
E16707-14	August 2017	Documentation updates for BRM 7.5 Patch Set 19. ▪ Updated the following section: Installing the Invoice Data Manager
E16707-15	December 2019	Documentation updates for BRM 7.5 Patch Set 23. ▪ Added the "Setting the Maximum Number of Items in the Search Template"section.

1

Designing and Generating Invoices

This chapter describes how to design and generate Oracle Communications Billing and Revenue Management (BRM) invoices and how to send them to customers.

About Invoices

You can use BRM to generate invoices and provide them to customers. An invoice lists the balance information for a customer's bill. When you use Customer Center to display the invoices, the invoices show the total balance in both primary and secondary currencies (if two currencies are configured with appropriate exchange rates), but show only the primary currency for individual events.

When billing runs, a bill is produced for every bill unit in an account and invoices are generated for each bill. There are two invoice types provided: *detailed* and *summary*.

- A detailed invoice lists the bill items for the bill unit and the events that have currency balance impacts greater than zero. The detailed invoice mode is the default.

  Note: Generating detailed invoices requires more system processing and may slow performance.

- A summary invoice lists only the bill items and not the events.

For accounts in a hierarchical group, the billing data for each subordinate bill unit in a child account is rolled up to the invoice for the parent account receivable (A/R) account. This invoice is referred to as a *consolidated* invoice because it contains the billing data for the subordinate bill units of each child account in addition to the billing data for the A/R account's bill unit. For information about hierarchical account groups, see "Creating and Managing Hierarchical Account Groups" in *BRM Managing Accounts Receivable*.

Note: If you use detailed invoices, generating the consolidated invoice can be system intensive, and the consolidated invoice can be extremely large. Therefore, you can set invoicing thresholds to control the size of the consolidated invoice and the subordinate data contained in it. See "About Invoicing for Hierarchical Account Groups".

BRM Invoice Features

BRM invoices present a set of data related to service usage, charges, discounts, promotions, taxes, and surcharges.

The following are important features of BRM invoices:

- Support customization. You can customize the information included in an invoice in several ways. See "Customizing the Information Included in Invoices".
- Support brand-specific invoices. See "About Brand-Specific Invoices".
- Support localized invoices. See "About Localized Invoices".
- Support multiple invoices for one customer. See "Defining Multiple Invoices for One Customer".
- Support different ways to send the invoice to customers. See "Sending Invoices to Customers".
- Include the following details:
  - Charge summary and usage details. The breakdown of usage charges includes the gross usage charges and applicable discounts and taxes. For example, if the net usage charge is $355.08, the invoice document displays the breakdown as: Gross Charge: 348, Discount: (25.20), and Tax: 32.28.
  - Wireless service usage details (if the customer uses wireless service).
  - Past due amount details from the past bill.
  - Usage details of accounts with multiple phone numbers.
  - Hierarchical account details.
  - Promotion names.
  - A/R actions having currency or non-currency impact, such as adjustment, dispute, settlement, and write-off details.

  Note: When the corrective invoice feature is enabled, regular invoices do not include special items allocated in corrective bills from the previous cycles.

If you use the BRM-Oracle Business Intelligence Publisher (BI Publisher) integration framework to generate invoice documents, you can add marketing messages, customer information from a customer relationship management (CRM) system, and messages from accounting department to the invoice. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

A sample invoice is in "Understanding Invoice Layout".

About the Invoicing Process

BRM performs the following operations to generate invoices:

1. When you run the daily billing script, BRM finds accounts at the end of their billing cycle. For a description of this script, see "About Billing Your Customers" in *BRM Configuring and Running Billing*.
2. BRM creates a bill for each account bill unit when it runs the **pin_bill_accts** utility as part of the daily billing script. BRM needs a bill before generating an invoice.

3. BRM generates an invoice for each bill. See "Generating Invoices".
4. BRM stores all invoices either in the BRM database schema that contains the invoiced accounts or in a separate invoice-only schema that you set up. For more information, see "Storing Invoices in a Separate Database Schema".

> **Important:** Storing invoices in a separate database schema is supported only on Oracle databases.

After an invoice is generated:

- You can display the invoice in Customer Center and Self-Care Manager. The invoice's format is based on a template you create and load. See "Designing Invoice Templates".
- You can send the invoice to your customer. See "Sending Invoices to Customers".

For information about generating invoices, see "Generating Invoices".

You can also customize, enrich, and present BRM invoices by using the capabilities of BI Publisher. For information about generating invoice documents by integrating BRM and BI Publisher capabilities, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

About Invoicing for Hierarchical Account Groups

When the **pin_inv_accts** utility processes bills for parent accounts in an account hierarchy, it searches the BRM database for the subordinate bill units and generates their invoices automatically.

You can set threshold values to ensure system performance is not decreased while processing invoices for large hierarchical account groups. The threshold values set the maximum number of child accounts containing subordinate bill units that can be rolled up to the parent A/R account and processed for invoicing.

If the value of the **/bill** object's PIN_FLD_AR_HIERARCHY_SIZE field is greater than the threshold value, the parent account's invoice includes information from only the parent bill unit.

If the number of subordinate bill units is less than or equal to the threshold, the parent account's invoice includes subordinate bill unit information.

> **Important:** If bill suppression is enabled on a parent (A/R) account and the subordinate account threshold is exceeded, invoicing fails. This occurs because subordinate bill units, which use the bill number of their parent account, are generated even when billing for the parent account is suppressed. In such cases, they will not contain bill numbers, which invoices require. To exclude invoicing for these bills, run **pin_inv_accts** with the **-skip_blank_billnos** parameter. (Subordinate bill units contain bill numbers only when their parent accounts are billed.)

For information on setting the threshold values, see "Setting Defaults for Hierarchical Group Invoices".

About Viewing Invoices for Subordinate Accounts

If you open a subordinate account in Customer Center and run Bill Now for the account, the account's bill and invoice can be viewed only in the parent account's information page.

When **pin_inv_accts** is run, it generates invoices for subordinate accounts. You can view these invoices in Customer Center and Self-Care Manager when viewing the subordinate account's information.

In Self-Care Manager, invoices can be viewed only for the account that is logged in. To view an invoice for a subordinate account, the subordinate account must be logged in.

About Brand-Specific Invoices

If you support multiple brands, you can use a separate invoice design for each brand. Create a separate template for each brand and then specify the brand when loading each template. See "Designing Invoice Templates" and "Loading Invoice Templates".

If a brand does not have a template associated with it, BRM uses the system template.

You can also define a different list of event types for each brand's invoices with the **pin_load_invoice_events** utility. See "pin_load_invoice_events".

About Localized Invoices

You can create localized invoices in BRM, as follows:

- Use UTF8 encoding for hard-coded text strings in XSLT or HTML invoice templates, such as table titles.
- Specify the BRM locale when loading your invoice template. See "Loading Invoice Templates".

You can also use DOC1 from Group 1 Software, Inc., to create localized invoices. For information, see the DOC1 documentation.

Defining the Invoice Type

The PIN_FLD_INV_TYPE field in the **/payinfo** object defines which type of invoice to generate for a given bill unit. Table 1–1 lists the possible values for PIN_FLD_INV_TYPE and the corresponding type of invoice that BRM generates.

Table 1–1 PIN_FLD_INV_TYPE Values and Invoice Generated by BRM

Value	Binary Notation	Regular Invoice (if) Generated	Corrective Invoice (if) Generated
0	0000 0000	Detail	Detail Replacement Invoice
1	0000 0001	Summary	Detail Replacement Invoice
2	0000 0010	Detail	Summary Replacement Invoice
3	0000 0011	Summary	Summary Replacement Invoice
4	0000 0100	Detail	Detail Invoice Correction Letter
5	0000 0101	Summary	Detail Invoice Correction Letter
6	0000 0110	Detail	Summary Invoice Correction Letter
7	0000 0111	Summary	Summary Invoice Correction Letter

Note: For regular invoices, the **-detail** and **-summary** parameters of the **pin_inv_accts** utility override the PIN_FLD_INV_TYPE field values in the **/payinfo** object.

For corrective invoices, the **-corr_type**, **-detail**, and **-summary** of the **pin_inv_accts** utility override the PIN_FLD_INV_TYPE field values in the **/payinfo** object. See "Specifying the Type of Corrective Invoice".

To generate summary invoices, change the value of the PIN_FLD_INV_TYPE field in the **/payinfo** object to the required value listed in Table 1–1.

- To set this value when creating a customer account, pass it in the input flist of the PCM_OP_CUST_COMMIT_CUSTOMER opcode.
- To set this value when adding or changing a payment method, pass it in the input flist of the PCM_OP_CUST_SET_PAYINFO opcode.

When this value is set, the PCM_OP_INV_MAKE_INVOICE opcode uses it in conjunction with the position of the bill, in relation to other bills, to set the PIN_FLD_INV_FLAGS value in the **/invoice** object. Possible values are listed in Table 1–2:

Table 1–2 PIN_FLD_INV_FLAGS Values

Type of Invoice	PIN_FLD_INV_FLAGS Hex Value
Summary invoice for a non-hierarchical account.	0x0006
Detailed invoice for a non-hierarchical account.	0x0005
Summary invoice for a subordinate bill unit.	0x000A
Detailed invoice for a subordinate bill unit.	0x0009
Summary invoice for a parent A/R account. (Nonconsolidated: does not include subordinate bill data).	0x0012
Detailed invoice for a parent A/R account. (Nonconsolidated: does not include subordinate bill data).	0x0011
Summary invoice for a parent A/R account. (Consolidated: includes subordinate bill data).	0x0001A
Detailed invoice for a parent A/R account. (Consolidated: includes subordinate bill data).	0x00019

For information on generating invoices, see "Generating Invoices".

Defining Multiple Invoices for One Customer

You can define multiple invoices for one customer by identifying each invoice with a unique invoice name. This enables you to assign a specific invoice to a specific bill unit in a customer's account.

For example, a customer wants the invoice for one bill sent to a home address and the invoice for another bill sent to a business address. You can set up two invoices: one with an invoice name of "Home" that contains the customer's home address information and one with an invoice name of "Work" that contains the customer's work address information.

> **Note:** At any time, you can have only one invoice assigned to a customer account. You can select the invoice type from a list of invoices defined for a customer.

To assign an invoice ID to an invoice, do either of the following:

- Use Customer Center to set the Invoice payment method ID value of an invoice. You access this field from the Payment Options dialog box when setting up a new payment method for an account during account creation or account maintenance. For more information, see the Customer Center Help.
- Use a custom CRM system to pass the invoice name in the input flist of PCM_OP_CUST_SET_PAYINFO. Use the PIN_FLD_NAME field in the PIN_FLD_PAYINFO array.

Designing Invoice Templates

The invoice's format is based on a template you create and load. BRM uses the template to display invoices in Customer Center and customer self-care Web pages.

You can use one invoice template for all accounts, or, if you support multiple brands, you can use a separate template for each brand.

By default, BRM uses an HTML template (*BRM_home***/sys/data/config/pin_invoice_template.html** where *BRM_home* is the directory in which BRM is installed). You can define your own template in one of the following formats:

- **XSLT style sheets**: This is the most flexible and powerful option for designing invoices. See "Using XSLT Invoice Templates".
- **HTML files**: You can create your own HTML template or modify an HTML template that BRM provides. See "Using HTML Invoice Templates".
- **Hyperlinked Invoice Templates:** Use hyperlinked invoice templates to display invoices for large bill unit hierarchies with better memory efficiency. See "Using Hyperlinked Invoice Templates".

After you create a template, you load it into BRM. See "Loading Invoice Templates".

If you use a third-party invoice application, you do not need to create an invoice template. You export the invoice data to the external tool. See "Exporting Invoices".

Using XSLT Invoice Templates

BRM uses XSLT style sheets and an XSLT processor to generate HTML invoices that can be displayed in Customer Center or a Web browser.

> **Note:** By default, BRM supports the Xalan XSLT processor. If you want to use a different XSLT processor, see "Using an XSLT Processor Other Than the Xalan XSLT Processor".

BRM provides two sample style sheets, located in *BRM_home***/sys/data/config/stylesheets**:

- **sample1.xsl**: This is the default BRM invoice template.
- **sample2.xsl**

You can use or edit these style sheets or create your own XSLT style sheet with a third-party XSLT editor.

You can use an XML version of an invoice as the basis for creating the style sheet. To export an invoice to XML, see "Exporting Invoices".

After you create or modify an XSLT style sheet, you load it into the BRM database by using the **pin_load_invoice_template** utility. See "Loading Invoice Templates".

Turning on XSLT Style Sheet Processing

If you use XSLT style sheet templates, you need to run the BRM invoice formatter to enable invoices to be displayed. The formatter is a Java process that takes XML data and an XSLT style sheet and generates an HTML invoice.

To run the invoice formatter, run the following command:

```
start_formatter
```

Using an XSLT Processor Other Than the Xalan XSLT Processor

You can use an XSLT processor other than the Xalan XSLT processor to generate HTML invoices.

To use an XSLT processor other than the Xalan XSLT processor:

1. Download the XSLT processor you want to use.
2. Implement the **PXSLTEngineIntf.class** available in the *BRM_home*/**jars/pxslt.jar** in Java using the downloaded XSLT processor.
3. Package the generated class file into a **.jar** file.
4. Copy the **.jar** file to *BRM_home*/**jars**.
5. Open the *BRM_home*/**sys/formatter/Infranet.properties** file in a text editor.
6. Search for the following entry:

   ```
   infranet.pxslt.engine=com.portal.pxslt.PXSLTEngineXalanImpl
   ```

7. Change this entry to:

   ```
   infranet.pxslt.engine=path.PXSLTEngineCUSTOMImpl
   ```

   where:

   - *path* is the location of the new transformation engine.
   - *PXSLTEngineCUSTOMImpl* is the new transformation engine.
8. Save and close the file.
9. Start and stop the invoice formatter by running the following commands:

   ```
   stop_formatter
   start_formatter
   ```

Using HTML Invoice Templates

You design HTML invoice templates by using an HTML editor or other application. You can use the HTML template provided with BRM as a starting point (*BRM_home*/**sys/data/config/pin_invoice_template.html**).

An HTML template needs to include the following variables, which you will find in the default template:

- _INVOICENUM_
- _CORPIMAG_
- _CORPADDR_
- _CUSTADDR_
- _AMOUNTDUE_
- _ACCOUNTSUMMARY_
- _ITEMS_
- _EVENTS_

When invoices are generated, data replaces the variables. To add variables, modify the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode. See "Customizing the Format for HTML Invoices".

After you create an HTML template, you load it into the BRM database by using **pin_load_invoice_template**. See "Loading Invoice Templates".

Using Hyperlinked Invoice Templates

BRM uses hyperlinked invoice templates to display invoices for large bill unit hierarchies with better memory efficiency. With hyperlinked invoice templates, you can easily navigate the invoice using a hyperlinked table of contents.

Note: Hyperlinked-invoice-template mode uses FTP delivery to create hyperlink text within PDF files for invoices, because hyperlink text must point to local files and not to links within the BI Publisher server.

To configure hyperlinked invoice templates:

1. Back up the BI Publisher repository, which has a default location of *BIP_home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/**

   where *BIP_home* is the directory in which BI Publisher is installed.

2. Load the stored procedures. See "Loading Stored Procedures for Hyperlinked Invoice Templates Reports".
3. Configure the bursting data source and query by setting up the data model configuration for hyperlinked invoice templates. See "Setting Up the Data Model for Hyperlinked Invoice Templates".
4. Set up the hyperlinked invoice templates. See "Setting Up the Hyperlinked Invoice Templates".
5. Add the hyperlink path prefix to *repository*/**Reports/BRM_Invoices/0.0.0.1/BRM_Bursting_Invoice_Report.xdo/xdo.cfg**. See "Modifying the Hyperlink Path Prefix".

Loading Stored Procedures for Hyperlinked Invoice Templates Reports

To load the stored procedures:

1. Go to *BRM_home*/**apps/pin_inv_doc_gen** directory.
2. Run the following command, which starts SQL*Plus:

sqlplus *login*/*password*@*database_alias*

where

- *login* is the login name to use for connecting to the BRM database.
- *password* is the encrypted password for *login.*
- *database_alias* is the BRM database alias.

3. Run the following command:

   SQL>**@ invoice_bursting_HIT.plb**

   The stored procedure is loaded.

4. Run the following command, which exits SQL*Plus:

   SQL>**exit**

Setting Up the Data Model for Hyperlinked Invoice Templates

To set up the hyperlinked invoice template data model:

1. Go to *BIP_home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/** directory.

   Note: If you do not use *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/** as your repository, navigate to your new repository.

2. Search for the following line:

   _datamodel.xdm

3. Rename it to the following:

   _datamodel.xdm**.ORIG**

4. Search for the following line:

   _datamodel_HIT.xdm

5. Rename it to the following:

   _datamodel.xdm

6. Open the **_datamodel.xdm** file and edit the following:

   PARAMETER1 to *__FTP_SERVERNAME__*

   PARAMETER4 to *__FTP_REMOTE_DIRECTORY__*

   where:

   - *__FTP_SERVERNAME__* is your FTP server name
   - *__FTP_REMOTE_DIRECTORY__* is your FTP destination directory

7. Save and close the file.

Setting Up the Hyperlinked Invoice Templates

To set up the hyperlinked invoice templates:

1. Go to the *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices/***schema_number*/**BRM_Bursting_Invoice_Report.xdo** directory.
2. Search for the following:

   `BRM_Corporate_Correction_Invoice.rtf`
3. Rename it to the following:

   `BRM_Corporate_Correction_Invoice.rtf`**.ORIG**
4. Search for the following:

   `BRM_Corporate_Invoice.rtf`
5. Rename it to the following:

   `BRM_Corporate_Invoice.rtf`**.ORIG**
6. Search for the following:

   `BRM_Corporate_Replacement_Invoice.rtf`
7. Rename it to the following:

   `BRM_Corporate_Replacement_Invoice.rtf.ORIG`
8. Search for the following:

   `BRM_Corporate_Correction_Invoice_HIT.rtf`
9. Rename it to the following:

   `BRM_Corporate_Correction_Invoice.rtf`
10. Search for the following:

    `BRM_Corporate_Invoice_HIT.rtf`
11. Rename it to the following:

    `BRM_Corporate_Invoice.rtf`
12. Search for the following:

    `BRM_Corporate_Replacement_Invoice_HIT.rtf`
13. Rename it to the following:

    `BRM_Corporate_Replacement_Invoice.rtf`

    Note: You can also load **HIT.rtf** templates within the BI Publisher server.

14. In the **xdo.cfg** file, edit the following:

    ```
    <property name="fo-external-link-base-url">file:__FTP_REMOTE_DIRECTORY__</property>
    ```

    where:

    - *__FTP_REMOTE_DIRECTORY__* is your FTP remote destination directory.
15. Save and close the file.
16. Restart the BI Publisher server.

Modifying the Hyperlink Path Prefix

The BI Publisher creates hyperlinks within PDF files. The default directory is in the BI Publisher hierarchy, inaccessible to other users wishing to access the hyperlink.

To modify the hyperlink path prefix:

1. In the **xdo.cfg** file, add your desired hyperlink path prefix to *repository*/**Reports/BRM_Invoices/0.0.0.1/BRM_Bursting_Invoice_Report.xdo/xdo.cfg**.

   For example:

   file:/tmp/*ftpinvoices***/***filename***.pdf**

   where:

   - *ftpinvoices* is the hyperlink path prefix
   - *filename* is the PDF file name

2. Save and close the file.

Note: Copy PDF files that are intended for viewing on another machine in the same directory structure as the source. Alternatively, edit the **xdo.cfg** file so that the final directory path matches the machine intended for viewing.

Note: For hyperlinked invoice templates to produce the split PDFs and hyperlinks, set thresholds in **/config/business_param** and run

- normal invoicing with **-hierarchy flag**

  ```
  - pin_inv_accts -verbose -hierarchy
  ```

  ```
  - pin_inv_accts -verbose -pay_type 10001
  ```

- trial invoicing with the **-paytype parameter**

  ```
  - pin_trial_bill_accts -start xxx -end yyy -pay_type
  10007
  ```

  ```
   - pin_trial_bill_accts -start xxx -end yyy -pay_type
  10001
  ```

Loading Invoice Templates

After creating your template, load it into the BRM database.

To load an invoice template:

1. Go to a directory that contains a valid configuration file.

   pin_load_invoice_template uses information in the configuration file to connect to the BRM database. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide*.

2. Run the following command, which loads an XSLT style sheet:

   pin_load_invoice_template -brand "*brand_POID***"-type text/html -locale** *locale_name* **-template** *filename* **-usexsl**

   where:

- *brand_POID* is the POID of a brand account or the root account. Use a brand account POID to assign the template to a specific brand. Use the root account POID if your system does not use brands or if you want the template to be available to multiple brands.
- *locale_name* is the BRM locale of the template. See "Locale Names" in *BRM Developer's Guide*.
- *filename* is the name and full path of the template file.

For example, the following command loads the English template **sample1.xsl** for the root account:

```
pin_load_invoice_template -brand "0.0.0.1/account 1" -type text/html -locale
en_US -template /opt/portal/sys/data/config/sample1.xsl -usexsl
```

3. To load an HTML template, enter:

   pin_load_invoice_template -brand "*brand_POID***" -type HTML -locale** *locale_name* **-template** *filename*

   where:

   - *brand_POID* is the POID of a brand account or the root account. Use a brand account POID to assign the template to a specific brand. Use the root account POID if your system does not use brands or if you want the template to be available to multiple brands.
   - *locale_name* is the BRM locale of the template. See "Locale Names" in *BRM Developer's Guide*.
   - *filename* is the name and full path of the template file.

   For example, the following command loads the English template **pin_invoice_template.html** for the root account:

   ```
   pin_load_invoice_template -brand "0.0.0.1/account 1" -type HTML -locale en_US
   -template /opt/portal/sys/data/config/pin_invoice_template.html
   ```

Disabling the Default HTML Template

If you load brand-specific templates into the BRM database, disable the system template that BRM uses by default.

To disable the default HTML template:

1. Open the Connection Manager (CM) configuration file (*BRM_home*/**sys/cm/pin.conf**).
2. Disable the default template that belongs to the root account by entering a crosshatch (#) at the beginning of the following entry:

   ```
   - fm_inv_pol html_template $DM{'db_num'} /config/invoice_templates 101
   ```

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

For information about configuration files, see "Using Configuration Files to Connect and Components" in *BRM System Administrator's Guide*.

Switching between XSLT and HTML Templates

You can switch between using an XSLT template and using an HTML template without loading a new template. You do this for a specific brand or for root.

To switch to an XSLT template, enter:

```
pin_load_invoice_template -brand "brand_POID" -usexsl
```

To switch to an HTML template, enter:

```
pin_load_invoice_template -brand "brand_POID"
```

where *brand_POID* is the POID of a brand account or the root account.

How Invoices Are Formatted

To format invoices, use the PCM_OP_INV_FORMAT_INVOICE opcode. This opcode performs XSL transformation on an invoice.

This opcode is called by the PCM_OP_INV_POL_FORMAT_INVOICE_XSLT policy opcode to apply an XSL style sheet to an invoice. It receives as input an XML formatted invoice and an XSL style sheet. It applies the style sheet to the invoice and returns the formatted invoice.

> **Note:** The XSL transformation is done in the Java Server with the help of XSLT software.

PCM_OP_INV_FORMAT_INVOICE uses the POID of the **/bill** object or **/invoice** object to locate and retrieve a specific invoice. Specify the output format of the invoice as a mime type in the PIN_FLD_TYPE_STR field in the input flist.

PCM_OP_INV_FORMAT_INVOICE performs the following tasks:

- Checks the **/invoice** object to see whether the format specified in the PIN_FLD_TYPE_STR field is stored in the object. Invoices can be stored in the database as pin_flist, XML, HTML, or DOC1 format.
- If the specified format is stored, the invoice is retrieved and returned in the format specified.
- If the specified format is not stored, the PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode is called to attempt to format the invoice. Invoices can use HTML, XML, or DOC1 format. To apply an XSL style sheet to the invoice, specify the XSL mime type in the PIN_FLD_TYPE_STR field.

If successful, PCM_OP_INV_FORMAT_INVOICE returns a buffer containing the formatted invoice. The PIN_FLD_RESULT field in the output flist is set to **1**.

If unsuccessful, no invoice is returned. The PIN_FLD_RESULT field is set to **0**.

Generating Invoices

Use the **pin_inv_accts** utility to generate invoices either automatically as part of daily billing or separately.

For information on how to generate invoices during trial billing, see "About Trial Billing" in *BRM Configuring and Running Billing*.

Generating Invoices Automatically

Typically, you generate invoices automatically as part of running the **pin_bill_day** billing script. This script runs several utilities, including **pin_inv_accts**, the invoicing utility. For more information on **pin_bill_day**, see "About Running the Billing Scripts" in *BRM Configuring and Running Billing*.

pin_inv_accts runs twice. In the first run, it performs the following tasks to handle hierarchy groups:

1. Searches for all bills that have reached the end of their billing cycle and for which invoices have not yet been generated.
2. Checks the subordinate threshold values in the **/config/business_params** object to determine the maximum number of child accounts having subordinate bill units that are allowed in the hierarchy group. See "About Invoicing for Hierarchical Account Groups".
3. For each **/bill** object retrieved, checks the PIN_FLD_AR_HIERARCHY_SIZE value to determine if it exceeds the threshold value.
4. If the threshold is exceeded, uses multiple threads to retrieve the subordinate bill units and to generate an invoice for each one.

   Important: If bill suppression is enabled on a parent (A/R) account and the subordinate account threshold is exceeded, invoicing fails. This occurs because subordinate bill units, which use the bill number of their parent account, are generated even when billing for the parent account is suppressed. In such cases, they will not contain bill numbers, which invoices require. To exclude invoicing for these bills, run **pin_inv_accts** with the **-skip_blank_billnos** parameter. (Subordinate bill units contain bill numbers only when their parent accounts are billed.) See "About Invoicing for Hierarchical Account Groups".

   If no errors occurred, **pin_inv_accts** runs a second time to generate invoices for parent accounts in hierarchy groups and for non-hierarchical accounts:

5. Searches for all bills that have reached the end of their billing cycle and for which invoices have not yet been generated.
6. For each **/bill** object retrieved, generates an invoice.

If you configured BRM to use a separate database schema for invoices, **pin_inv_accts** uses the Invoice Data Manager, **dm_invoice** to store invoices in the separate schema. See "Storing Invoices in a Separate Database Schema".

Generating Invoices Manually

To generate invoices manually:

1. Run the other billing utilities.

   For the names of the other utilities and the order in which to run them, see "Running Billing Utilities Manually" in *BRM Configuring and Running Billing*.

2. (Optional) Store invoices in their own database schema by following the procedures in "Storing Invoices in a Separate Database Schema".

3. Go to a directory with a valid invoicing configuration file. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide*.
4. Run **pin_inv_accts** and specify any necessary parameters. For example, to generate detailed invoices for bills that have the summary flag set, use the **-detail** parameter.

> **Important:** If bill suppression is enabled on a parent (A/R) account and the subordinate account threshold is exceeded, invoicing fails. This occurs because subordinate bill units, which use the bill number of their parent account, are generated even when billing for the parent account is suppressed. In such cases, they will not contain bill numbers, which invoices require. To exclude invoicing for these bills, run **pin_inv_accts** with the **-skip_blank_billnos** parameter. (Subordinate bill units contain bill numbers only when their parent accounts are billed.) See "About Invoicing for Hierarchical Account Groups".

For more information on the syntax and parameters for **pin_inv_accts**, see "pin_inv_accts".

Generating Detailed Invoices from an External File

To generate detailed invoices from bills contained in an external file, run **pin_inv_accts** with the **-file** parameter:

```
pin_inv_accts -file filename
```

The file contents must be in pin_flist format. For example:

```
0 PIN_FLD_RESULTS      ARRAY [0]
1   PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26011 0
0 PIN_FLD_RESULTS      ARRAY [1]
1   PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26091 0
```

For more information, see "About Formats for Storing Invoices".

This operation overwrites the PIN_FLD_INVOICE_OBJ value in the **/bill** object.

> **Note:** When **pin_inv_accts** processes bills for parent accounts in an account hierarchy, it searches BRM for the subordinate bill units and generates their invoices automatically. In general, the file should not contain the bills for subordinate bill units; however, if they are present, invoices for the subordinate bill units are generated.

Generating Invoices for Non-Invoice Payment Methods

To generate invoices for non-invoice payment methods, run the following command:

```
pin_inv_accts -pay_type payment_method_ID
```

where *payment_method_ID* is the element ID of the payment method.

For a list of payment methods and their element IDs, see "Understanding Payment Methods" in *BRM Managing Customers*.

For example, to generate invoices for credit cards, run the utility with the following command:

```
pin_inv_accts -pay_type 10003
```

Note: This generates *detailed* invoices. To generate *summary* invoices, customize the PCM_OP_INV_POL_SELECT policy opcode to pass the summary value in the PIN_FLD_FLAGS field on its input flist (PIN_FLD_FLAGS = 0x0002). You can also run **pin_inv_accts** with the **-summary** parameter to generate summary invoices.

Improving Performance When Generating Invoices

By default, when generating invoices, BRM searches for all items and events in the database, regardless of whether they are included in the invoice. BRM performs the following search operations in steps, which means that it returns search results in blocks instead of returning all search results at one time:

- Searches for the **/bill** object to retrieve the account summary information such as the bill number, billing cycle details, payment due date, and amount due.
- Searches for items and events associated with the **/bill** object to retrieve billing information such as purchase fees, cycle fees, and usage fees.
- Searches for all A/R items and events associated with the **/billinfo** object to retrieve A/R information such as adjustments, disputes, and refunds.

After the search operations are complete, BRM then categorizes the results and displays only the specified events and items on the invoice.

You can improve performance by using the CM configuration file entries **inv_item_fetch_size** and **inv_event_fetch_size** to change the number of items and events returned in a block of search results.

1. Open the CM configuration file (*BRM_home***/sys/cm/pin.conf**).
2. Change the value of the **inv_item_fetch_size** entry.

   The default is **10000**.
3. Change the value of the **inv_event_fetch_size** entry.

   The default is **10000**.
4. Stop and restart the CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

To customize the search operation (for example, to search for specific items or to omit a step), see "Customizing Invoice Search Operations".

Specifying Event Fields to Cache for Invoicing

The PIN_FLD_INVOICE_DATA field in the **/event** object contains a cache of all fields that need to be handled in invoicing. Use the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode to define which balance impact fields to cache for invoicing.

You can improve performance by limiting the amount of information cached. However, if you need the information, caching a field is quicker than having it read from the event table.

By default, the policy opcode caches the following PIN_FLD_BAL_IMPACTS array fields shown in Table 1–3 in the base table field PIN_FLD_INVOICE_DATA.

Note: The PIN_FLD_INVOICE_DATA field is limited to 4000 bytes. If the event cache size of the PIN_FLD_INVOICE_DATA field is greater than 4000 bytes, the PCM_OP_INV_POL_PREP_INVOICE policy opcode is used to determine which event information is displayed on invoices. If you customized the PIN_FLD_INVOICE_DATA field to include more event information, you need to include the same information in the *BRM_SDK_Home*/**source/sys/fm_inv_pol/fm_inv_pol_prep_invoice.c** source file.

Table 1–3 Cached PIN_FLD_BAL_IMPACTS Fields

Opcode	Description
PIN_FLD_AMOUNT	The account balance impact. The value can be positive or negative.
PIN_FLD_DISCOUNT	The discount applied to the balance impact.
PIN_FLD_IMPACT_TYPE	Balance impact type - rated by BRM rated-engine (0x1), pre-rated (0x2), taxed (0x4), purchase order (0x8), re-rated(0x20), and reverse_rated(0x40).
PIN_FLD_ITEM_OBJ	Link to the item object affected by this event. Applies only to the balance array element that impacts currency resources. (This may be different from the PIN_FLD_ITEM_OBJ field in the base **/event** object.)
PIN_FLD_QUANTITY	The quantity applied. The number of units actually applied using this rate.
PIN_FLD_RATE_TAG	Description of the rate used. Same as PIN_FLD_DESCR in the **/rate** object.
PIN_FLD_RESOURCE_ID	Numeric value of the resource that is impacted.
PIN_FLD_TAX_CODE	Tax code for the rate used. When taxes do not apply, this field is set to **0**.

If you remove these fields from the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode and leave the event cache turned on, there will be no event details in the invoices.

Note: If you do not use event caching, return a NULL pointer to the caller of the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode.

You can customize the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode to cache additional balance impact array fields by modifying the *BRM_home*/**source/sys/fm_act_pol/fm_act_pol_spec_event_cache.c** file.

If you turn off caching in the CM configuration file, these fields are read directly from the event table, which slows performance.

Important:

- If you remove the default fields of the PIN_FLD_BAL_IMPACTS array from the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode and leave the event cache turned on, there will be no event details in the invoices.
- The event cache must not exceed 4000 bytes. If you have a large number of elements in the PIN_FLD_BAL_IMPACTS array, you must disable the **event_cache** flag in the CM configuration file or include the required elements in the *BRM_SDK_Home*/**source/sys/fm_inv_pol/fm_inv_pol_prep_invoice.c** source file.

To enable or disable caching of the PIN_FLD_BAL_IMPACTS array, edit the CM configuration file (*BRM_home*/**sys/cm/pin.conf**). The default is caching on. Any number except zero enables caching.

```
- fm_inv     event_cache     1
```

Decoding Cached Event Data for Invoicing

The PCM_OP_INV_DECODE_INVOICE_DATA opcode parses the event data being retrieved for an invoice. This opcode retrieves the contents of the PIN_FLD_INVOICE_DATA field, parses the data, and returns the decoded data in the output flist.

The input flist contains the PIN_FLD_INVOICE_DATA field, which is a cached string that needs to be decoded. It is limited to 4000 bytes. If the event cache size of the PIN_FLD_INVOICE_DATA field is greater than 4000 bytes, the PCM_OP_INV_POL_PREP_INVOICE policy opcode determines which event information is displayed on invoices. If you customized the PIN_FLD_INVOICE_DATA field to include more event information, you need to include the same information in the *BRM_SDK_Home*/**source/sys/fm_inv_pol/fm_inv_pol_prep_invoice.c** source file.

The output flist contains the PIN_FLD_EXTENDED_INFO substruct, which contains the fields decoded from the PIN_FLD_INVOICE_DATA field.

Note: If you defined custom event caching for Pipeline Manager in the **/config/invoice_data_map** file, you must configure PCM_OP_INV_DECODE_INVOICE_DATA to decode the data.

For information on defining fields to cache for invoicing, see "Specifying Event Fields to Cache for Invoicing".

How Invoices Are Generated

pin_inv_accts runs as part of your daily billing to create a regular invoice for each account that is billed on that day. Additionally, you run **pin_inv_accts** to generate corrective invoices for any corrective bills generated that day.

pin_inv_accts runs twice to create these invoices: in the first run, invoices are generated for subordinate bill units in a hierarchy; in the second run, invoices are generated for parent accounts and all non-hierarchical accounts. In both runs, this utility calls the PCM_OP_INV_MAKE_INVOICE opcode to create an invoice. This is the first opcode that gets called to create an invoice for a designated **/bill** object.

How PCM_OP_INV_MAKE_INVOICE Works

PCM_OP_INV_MAKE_INVOICE takes the POID of the bill object and calls the PCM_OP_INV_POL_SELECT policy opcode to determine whether custom processing or default processing is used to retrieve the events and items for billing. If custom processing is used, control is handed to the PCM_OP_INV_POL_SELECT policy opcode, which returns the results after the search operations are complete.

If default processing is used, PCM_OP_INV_MAKE_INVOICE performs the following:

- Retrieves the invoicing threshold value in the **/config/business_params** object to determine whether invoices for subordinate bill units should be generated or consolidated into the parent account invoice. If generated, the parent account's invoice will not contain the subordinate bill unit's invoice data. See "About Invoicing for Hierarchical Account Groups".
- Retrieves all required information from the **/bill**, **/account**, **/billinfo**, and **/payinfo** objects.
  - For regular invoices, it uses the PIN_FLD_INV_TYPE field value from the **/payinfo** object to determine whether to generate a detailed invoice or a summary invoice. If the value is **1**, a summary invoice is created. If the value is **0** or **NULL**, a detailed invoice is created. See "About the Invoicing Process".
  - For corrective invoices, the opcode uses the information in the **/payinfo** object, the PIN_INV_TYPE_OF_CORRECTIVE_INVOICE and PIN_INV_CORRECTIVE__TYPE_TO_USE constants to determine whether it must generate a summary or detailed version of **Replacement Invoice** or **Invoice Correction Letter**.
  - For each billable item in an invoice correction letter, this opcode calls the PCM_OP_AR_GET_ALLOCATED_AR_ITEMS opcode which retrieves the allocated special items and additional information to filter out billable items. For more on PCM_OP_AR_GET_ALLOCATED_AR_ITEMS, see *BRM Developer's Reference*.
  - It uses the PIN_FLD_AR_HIERARCHY_SIZE value to determine if multithreaded processing should be used. This value defines the number of subordinate bill units for the parent account of the hierarchy group. If the PIN_FLD_AR_HIERARCHY_SIZE value for a bill exceeds the invoicing threshold, and the bill is for a parent A/R account, PCM_OP_INV_MAKE_INVOICE retrieves the subordinate bill units in that hierarchy by using multiple threads and processes them first.

    Note: The **-detail** and **-summary** parameters of **pin_inv_accts** override the PIN_FLD_INV_TYPE field value in the **/payinfo** object.

- Retrieves all events belonging to the bill items based on the **/config/invoice_events** object for a particular brand.
- Retrieves details about promotions purchased by the account, depending on the value of the **/config/business_params** object's **PromotionDetailDisplay** entry. See "Specifying Whether BRM Displays Promotion Details on Invoices".
- Recalculates the event's total amounts (PIN_FLD_TOTAL) including any sponsored charges.
- Retrieves the currency information.

- If the invoice data comes from Pipeline Manager or a custom application, reads the **/config/invoice_data_map** object to determine how to parse the invoice data into an flist.
- Updates the PIN_FLD_INV_FLAGS value in the **/invoice** object, which determines the type of invoice to generate. See "Defining the Invoice Type".
- Creates the formatted invoice and stores it in the database.
- Calls the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode to handle errors that occurred in custom operations performed by the PCM_OP_INV_POL_SELECT policy opcode.

When the PCM_OPFLG_CALC_ONLY flag is set, PCM_OP_INV_MAKE_INVOICE returns the invoice object but does not create the invoice object in the database. When the flag is *not* set, it returns the POID of the invoice object in the database.

Important: Bill Now and on-demand billing will not generate invoices for subordinate bill units even when the threshold value is exceeded. The consolidated invoice for the parent (paying) bill unit always gets generated.

Customizing Invoice Search Operations

You can customize the search templates during the invoicing operation so not all search operations are performed. To omit any of the search operations, or to modify the search for specific events and items, you use the PCM_OP_INV_POL_SELECT policy opcode, which is called by the PCM_OP_INV_MAKE_INVOICE opcode when generating invoices.

The PCM_OP_INV_POL_SELECT policy opcode enables you to create custom search templates to select which bill items and events are retrieved for invoices. This improves performance during invoicing because BRM performs only selective searches and does not have to process all accounts and events in the defined invoicing period.

BRM uses the PIN_FLD_BOOLEAN field in the output flist of this policy opcode to determine whether the invoices should be generated using the default item and event processing in PCM_OP_INV_MAKE_INVOICE or the custom item and event processing defined in the PCM_OP_INV_POL_SELECT policy opcode.

- PIN_BOOLEAN_FALSE indicates the PCM_OP_INV_POL_SELECT policy opcode is ignored and the output flist to PCM_OP_INV_MAKE_INVOICE is the same as the flist PCM_OP_INV_POL_SELECT received as input. This is the default.
- PIN_BOOLEAN_TRUE indicates the PCM_OP_INV_POL_SELECT policy opcode performs the processing. The output flist to PCM_OP_INV_MAKE_INVOICE contains the input flist and the results arrays generated by the custom processing. The output flist generally contains an array of items specified for the invoice, an array of events pertaining to each item returned, and an array of information retrieved from the event's invoice data cache.

PCM_OP_INV_MAKE_INVOICE uses the return flist from the PCM_OP_INV_POL_SELECT policy opcode to format the invoice and store it in the database. If the PCM_OP_INV_POL_SELECT policy opcode was not used for processing, it returns the input flist without changes.

If errors occur during the invoicing operations, use the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode to handle them. For example, you can customize this

policy opcode to return the event that caused the invoice failure. When PCM_OP_INV_MAKE_INVOICE encounters errors returned by the PCM_OP_INV_POL_SELECT policy opcode, it sends the error buffer as a string to the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode.

For information on changing the events displayed on an invoice, see "Including Payment, A/R, and Taxation Details in Invoices".

For information on handling errors, see "Configuring Error Checking for Customized Invoicing".

Creating Custom Search Templates

To create a custom search template for invoicing, use the PCM_OP_INV_POL_SELECT policy opcode. BRM uses the PIN_FLD_BOOLEAN value in the output flist of the PCM_OP_INV_POL_SELECT policy opcode to determine whether to use the default search functionality in PCM_OP_INV_MAKE_INVOICE or the customized search functionality in this policy opcode.

To customize the invoicing search operations, set up your policy opcode with the following information:

1. Specify the invoice template to use.

   Note: The invoice templates and style sheets that define the appearance of invoices are defined in the **/config/invoice_templates** object. You can define a different appearance for invoices. To load custom style sheets, run the **pin_load_invoice_template** utility.

2. Copy the input flist to the output flist.
3. Define the search criteria for the search template. For example, create the conditions under which A/R items and events are retrieved.
4. Search for the items defined in the search template.
5. Compile the results flist.
6. Append the retrieved items to the output flist.
7. Search for events corresponding to the retrieved items.
8. Append the retrieved events to the output flist.
9. Call the PCM_OP_INV_DECODE_INVOICE_DATA opcode to decode the PIN_FLD_INVOICE_DATA value of the **/event** object.
10. Send the result back to PCM_OP_INV_MAKE_INVOICE.

    Note: The events that are recorded on an invoice are defined in the **/config/invoice_events** object. By default, this object includes A/R events, such as payments and refunds, as well as cycle and usage events. You can create a **/config/invoice_events** object for custom events so that the search operation retrieves them and the specified attributes get displayed on the invoice. To specify the events recorded on an invoice, run the **pin_load_invoice_events** utility.

Example: Generating Invoices Based on Event Types

You can customize your database so that invoices contain a specific set of data based only on events you want. For example, you can generate invoices for your system that contain only adjustment and dispute information.

To do this:

1. In the PCM_OP_INV_POL_SELECT policy opcode, create the following search templates. In each template, customize the policy opcode to retrieve the items and events listed.

   Template 1

   - **/item/adjustment**
   - **/event/billing/adjustment/event**
   - **/event/billing/adjustment/item**
   - **/event/billing/adjustment/tax_event**

   Template 2

   - **/item/dispute**
   - **/event/billing/dispute/event**
   - **/event/billing/dispute/item**
   - **/event/billing/dispute/tax_event**
2. Append the search results from Template 1 and Template 2 to the output flist.
3. Customize the invoicing policy opcodes to display and print the A/R information retrieved by the search templates.

> **Note:** To generate invoices on a per-bill-unit basis, rather than a system-wide basis, you need to extend the **/payinfo** storable class to define the account-specific attributes. Then customize the PCM_OP_INV_POL_SELECT policy opcode to perform the searches based on the flag values.

Configuring Error Checking for Customized Invoicing

To perform error checking for customized invoicing, use the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode. This policy opcode is called after the invoice *commit* transaction to troubleshoot the errors detected by PCM_OP_INV_MAKE_INVOICE. If the **/invoice** object POID value in the input flist of the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode is *type* only, the invoice object was not created because errors occurred.

The PIN_FLD_ERROR_INFO array in the input and output flists contain information about the error.

You can configure the PCM_OP_INV_POL_POST_MAKE_INVOICE policy opcode to capture the event that caused the error and return it in the output flist.

For more information about error handling, see "Understanding API Error Handling and Logging" in *BRM Developer's Guide*.

Improving Performance by Removing Invoice Details You Do Not Need

By default, BRM invoices include billing details, such as usage items, device details, and tax totals, which helps customers understand the charges on their invoices. If your company does not offer telephony services or if your company does not want to publish certain details on invoices, you can improve invoicing performance by configuring BRM to retrieve only the invoice details needed.

To do so, you use a CM configuration file entry to specify the details to exclude from your invoices:

- **Exclude device details from invoices**. Improves performance by configuring BRM to skip the device search and the totaling of resources per device.

  Caution: Do not exclude device details if any of the accounts in your system contain devices; otherwise, accounts with devices will have incorrect invoices.

- **Exclude tax totals from invoices**. Improves performance by configuring BRM to skip the aggregation of tax totals. Exclude tax totals only if you do not have tax in the entire system and you will not perform A/R actions with taxes.

  Note: When you exclude tax totals from invoices, the **Taxes and Surcharges** line in the invoice Summary of Current Charges section is set to **0.00**.

- **Exclude plan, deal, and product pricing details from invoices**. Improves performance by configuring BRM to skip the retrieval of plan, deal, and product pricing details from the BRM database. When you exclude plan, deal, and product pricing details, invoices do not include plan names, detail names, or Siebel CRM promotion names.
- **Exclude balance group details**. Improves performance by configuring BRM to skip the search for balance group details.

  Note: When you exclude balance group details, invoices do not include noncurrency resources.

- **Consolidate the searches for real-time events and batch events into one search**. Improves performance by configuring BRM to retrieve BRM and pipeline event details from the BRM cache.

  Note: To consolidate the searches, the **event_cache** entry in the CM configuration file must be enabled. See "Enabling Event Caching".

To improve invoicing performance:

1. Open the CM configuration file (*BRM_home*/**sys/cm/pin.conf**).
2. Set the **inv_perf_features** entry to the appropriate value:

   ```
   - fm_inv inv_perf_features FlagValue
   ```

where *FlagValue* is a bitmap flag that specifies the details to exclude from your invoices. Each bit position controls a specific feature. To use multiple features, you must OR the bitmaps. For example, to exclude balance impact details, device details, and tax total details from your invoices, set *FlagValue* to **0x00003010**.

- **0x00000010** includes balance impact details from invoices.
- **0x00000800** improves search performance.
- **0x00001000** excludes device details from invoices.
- **0x00002000** excludes tax totals from invoices.
- **0x00004000** excludes plan, deal, product pricing details from invoices.
- **0x00008000** excludes balance group details from invoices.

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

Customizing the Information Included in Invoices

You can customize the information included in an invoice in several ways:

- Customize the layout of bill items. See "Customizing the Layout of Bill Items in Invoices".
- Group items by service type. See "Creating Service-Centric Invoices".
- Include customer payment, A/R, and taxation details. See "Including Payment, A/R, and Taxation Details in Invoices".
- Include the customer's time zone. See "Including the Time Zone in Invoices".
- Include shadow events. See "Including Shadow Event Adjustment Details in Invoices".
- Include soft descriptors. See "Including Soft Descriptors in Invoices".
- Include custom data. See "Including Custom Data in Invoices".
- Include late payment fees. See "Including Late Payment Fees in Invoices".
- Include finance charges. See "Including Finance Charges in Invoices".
- Aggregate taxes by tax supplier. See "Aggregating Taxes on Invoices".

Customizing the Layout of Bill Items in Invoices

You can customize the layout of bill items on an invoice.

To list bill items in a different order, use the PCM_OP_INV_POL_PREP_INVOICE policy opcode. When corrective invoicing is enabled, PIN_FLD_PREV_BILLINFO contains the details of the previous bill (if any). Additionally, the PIN_FLD_CORRECTION_INFO array under PIN_FLD_OTHER_ITEMS contains all the items specific to the corrective bill and its corresponding events.

To make other changes to the layout:

- If you are using an HTML invoice template, use the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode.
- If you are using an XSLT style sheet for the invoice template, you can perform this level of customization in the style sheet.

Creating Service-Centric Invoices

You can create invoices that group items by service. To do this, enable your invoices to show bill items grouped by service. By default, service-centric invoicing is disabled.

1. Open the CM configuration file (*BRM_home*/**sys/cm/pin.conf**).
2. Do one of the following:
   - To enable service-centric invoicing, set the value of **service_centric_invoice** to **1**:

     ```
     - fm_inv_pol service_centric_invoice 1
     ```

   - To disable service-centric invoicing, set the value of **service_centric_invoice** to **0**.
3. Save and close the file.
4. Stop and restart the CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

For information about configuration files, see "Using Configuration Files to Connect and Configure Components" in *BRM System Administrator's Guide*.

> **Note:** In the invoicing business profile, if the **EnableInvoicingIntegration** configuration business parameter is enabled, ensure that in *BRM_home*/**sys/cm/pin.conf**, the **service_centric_invoice** entry is commented out. By default, the **service_centric_invoice** entry is commented out. If this entry is not commented out, you can view the invoice document only in Customer Center and not in the BI Publisher client.

Including Payment, A/R, and Taxation Details in Invoices

You can specify details about customer's payments, A/R, and taxation details. You can specify a different set of events for each brand. See "pin_load_invoice_events" for details.

For information on customizing the events retrieved during invoicing, see "Customizing Invoice Search Operations".

Including Invoice Event Details

To include details in the invoice:

1. Open the *BRM_home*/**sys/data/config/events.file** file.
2. Add the event details you want to include in the invoice. See "Events that can be included in the events.file file".
3. Run the following command, which loads the event file:

   ```
   pin_load_invoice_events -brand "brand_poid" -eventfile file
   ```

   where *brand_poid* is the POID of the brand account and *file* is the name of the **events.file** file.

   If your system is not brand enabled, *brand_poid* must be the POID of the root account, **0.0.0.1 /account 1**.
4. To verify that the event types were loaded, you can display the **/config/invoice_events** object by using Object Browser, or use the **robj** command with the **testnap**

utility. See "Reading an Object and Writing Its Contents to a File" in *BRM Developer's Guide*.

Events that can be included in the events.file file

To include adjustment details in the invoice, include the following events in the **events.file** file (if not already present):

- **/event/billing/adjustment/account**
- **/event/billing/adjustment/event**
- **/event/billing/adjustment/item**
- **/event/billing/adjustment/tax_event**

To include payment details in the invoice, include the following events in the **events.file** file (if not already present):

- **/event/billing/payment/cash**
- **/event/billing/payment/cc**
- **/event/billing/payment/check**
- **/event/billing/payment/dd**
- **/event/billing/payment/payorder**
- **/event/billing/payment/postalorder**
- **/event/billing/payment/wtransfer**
- **/event/billing/payment/failed**
- **/event/billing/payment/voucher**
- **/event/billing/payment/voucher_topup**

To include payment reversal details in the invoice, include the following events in the **events.file** file (if not already present):

- **/event/billing/reversal/cash**
- **/event/billing/reversal/cc**
- **/event/billing/reversal/check**
- **/event/billing/reversal/dd**
- **/event/billing/reversal/failed**
- **/event/billing/reversal/payorder**
- **/event/billing/reversal/postalorder**
- **/event/billing/reversal/voucher**
- **/event/billing/reversal/wtransfer**

To include write-off-related events, include the following events in the **events.file** file (if not already present):

- **/event/billing/writeoff/bill**
- **/event/billing/writeoff/billinfo**
- **/event/billing/writeoff/item**
- **/event/billing/writeoff/tax_bill**

- **/event/billing/writeoff/tax_billinfo**
- **/event/billing/writeoff/tax_item**

To include refund-related events, include the following events in the **events.file** file (if not already present):

- **/event/billing/refund/cash**
- **/event/billing/refund/cc**
- **/event/billing/refund/check**
- **/event/billing/refund/dd**
- **/event/billing/refund/payorder**
- **/event/billing/refund/postalorder**
- **/event/billing/refund/wtransfer**

To include write-off reversal events, include the following events in the **events.file** file (if not already present):

- **/event/billing/writeoff_reversal**
- **/event/billing/writeoff_reversal/tax**

To include dispute and settlement details in the invoice, include the following events in the **events.file** file (if not already present):

- **/event/billing/settlement/event**
- **/event/billing/settlement/item**
- **/event/billing/settlement/tax_event**
- **/event/billing/dispute/event**
- **/event/billing/dispute/item**
- **/event/billing/dispute/tax_event**

The invoice displays tax-related information of the account whose invoice is generated.

To include tax-related information for the summary invoice, include **/event/billing/cycle/tax** in the **events.file** file.

To include any custom event, include the custom event in the **events.file**. For example, you can include **/event/billing/cycle/tax/federal** event to the **events.files**.

Including the Time Zone in Invoices

By default, invoices do not show the customer's time zone. To show the time zone on an invoice, do one of the following:

- If you are using an HTML invoice template, use the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode.
- If you are using an XSLT invoice template, edit the style sheet to use the PIN_FLD_TIMEZONE_ADJ_END_T and PIN_FLD_RATED_TIMEZONE_ID fields instead of the PIN_FLD_END_T field for the events.

Including Shadow Event Adjustment Details in Invoices

When recording a shadow event, you can customize your invoice to either show the adjustment details or show only the result of shadow event adjustments in the end balance.

Shadow events are also created by the BRM rerating process. You use the same configuration entry to show shadow event details for both adjustments and rerating. Therefore, to display adjustment details, you must also display rerating details, and vice versa.

In the CM configuration file (*BRM_home*/**sys/cm/pin.conf**), the **show_rerate_details** entry is set to **0** by default. This configuration controls whether to include shadow adjustment details due to rerating in the invoice details. By enabling this entry, rerated events, which have RERATE_OBJ set, are dropped from the invoice details. This means any shadow adjustment, (for example event adjustment before billing) will create shadow event and remain in the invoice details.

By default, the invoice document generated by using the BRM-BI Publisher integration framework displays all the event details including all shadow events to justify the charges being displayed. (These details are displayed on page 4 of the invoice document). If you enable the **show_rerate_details** entry (by setting it to **1**), the rerated events are not listed in the invoice document. Additionally, if all cycle/one-time/usage events were all rerated, the entire page will contain no entries. (Page 4 of the invoice document will be a blank page.)

Oracle recommends keeping the default value of the **show_rerate_details** entry for the invoice document generated by using the BRM-BI Publisher integration framework.

To set the shadow event invoice details entry:

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

   ```
   - fm_inv_pol show_rerate_details 0
   ```

   The default is **0**.
3. Save and close the file.
4. Stop and restart the CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Including Soft Descriptors in Invoices

You can add *soft descriptors*, which contain information to help customers recognize charges, to credit card and checking account statements. Soft descriptors are available for Paymentech direct debit and credit card processing. The following soft descriptors can be added to customer statements:

- Your DBA (doing business as) name
- Your product name
- Your customer service phone number (instead of your headquarters city)

There are two ways to add soft descriptor information:

- Configure the *BRM_home*/**sys/dm_fusa/pin.conf** configuration file. See "About Paymentech Soft Descriptor Credit-Card and Checking Statement Information" in *BRM Configuring and Collecting Payments* and "Including Soft Descriptors in Invoices".

- Modify the policy source file for the PCM_OP_PYMT_POL_PRE_COLLECT policy opcode. See "Customizing the Policy Source File for Soft Descriptors".

Customizing the Policy Source File for Soft Descriptors

You can customize the policy source file for the PCM_OP_PYMT_POL_PRE_COLLECT policy opcode to programmatically retrieve the soft descriptor information.

> **Note:** You can also customize the PCM_OP_PYMT_POL_PRE_COLLECT policy opcode to set a minimum amount to charge. See "Setting the Minimum Amount to Charge" in *BRM Configuring and Running Billing*.

The following example shows how to retrieve the merchant name and a plan descriptor. The maximum entry is 22 characters including spaces. If the information is longer than 22 characters, it is truncated on the statement.

```
pin_flist_t*sub_flistp = NULL;
void*vp = NULL;

/*
 * For each element in the PIN_FLD_CHARGES array add the soft
 * descriptors.
 */

/*
 * Add the merchant info substruct for the soft descriptors.
 */

sub_flistp = PIN_FLIST_SUBSTR_ADD(flistp, PIN_FLD_MERCHANT_INFO, ebufp);

/*
 * Add the merchant "doing business as" to the soft descriptors.
 */

vp = (void *) "Portal Internet Service";
PIN_FLIST_FLD_SET(sub_flistp, PIN_FLD_MERCHANT, vp, ebufp);

/*
 * Read the Product information from the account product array to  * pick up the
plan object.
 * (Exercise left to reader.)
 */

/*
 * Read Plan description from the plan object
 */
vp = (void *) NULL;
s_flistp = PIN_FLIST_CREATE(&ebuf);
vp = PIN_FLIST_FLD_GET(prod_flistp, PIN_FLD_PLAN_OBJ, 0, ebufp);
PIN_FLIST_FLD_SET(s_flistp, PIN_FLD_POID, vp, ebufp);
PIN_FLIST_FLD_SET(s_flistp, PIN_FLD_DESCR, NULL, ebufp);

/*
 * Read plan info.
 */
PCM_OP(ctxp, PCM_OP_READ_FLDS, 0, s_flistp, &r_flistp, ebufp);
vp = PIN_FLIST_FLD_GET(r_flistp, PIN_FLD_DESCR, 0, ebufp);
```

```
/*
 * Add the product name to the soft descriptors.
 */

PIN_FLIST_FLD_SET(sub_flistp, PIN_FLD_PROD_NAME, vp, ebufp);

/*
 * Add the merchant customer service phone number to the soft
 * descriptors.
 */

vp = (void *) "800-PORTAL1"
PIN_FLIST_FLD_SET(sub_flistp, PIN_FLD_PHONE, vp, ebufp);
```

Including Custom Data in Invoices

To customize the data displayed in invoices, use the PCM_OP_INV_POL_PREP_INVOICE policy opcode.

This policy opcode searches the database for information about the account and creates an flist of relevant fields to include at invoicing time.

You can customize invoice information by performing additional data searches, modifying large invoice flists, or adding additional brand-specific content to branded invoices. Customization done by the PCM_OP_INV_POL_PREP_INVOICE policy opcode is passed to the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode, where the storage format is specified.

You can customize the events and messages listed on an invoice as follows:

- **Include noncurrency events.** By default, BRM invoices list all events with a currency balance impact greater than zero. Use the PCM_OP_INV_POL_PREP_INVOICE policy opcode to include noncurrency events. For example, you can list hours of usage if you track hours as part of a promotion.
- **Include custom message.** Set up a custom solution to read messages from an external database and populate BRM database. Use the PCM_OP_INV_POL_PREP_INVOICE policy opcode to include the message in an invoice. For more information about setting up a custom solution please contact Oracle.
- **List fewer or more events.** Use the PCM_OP_INV_POL_PREP_INVOICE policy opcode.

> **Important:** Using the PCM_OP_INV_POL_PREP_INVOICE policy opcode to control which event information is displayed on invoices at invoicing time can affect performance if you access information normally not stored in the PIN_FLD_INVOICE_DATA field of the event. You will get better performance if you define the event information to be stored for invoicing when the event is created by using the PCM_OP_ACT_POL_SPEC_EVENT_CACHE policy opcode.

You must modify this policy opcode to enable messaging through the Universal Messaging Service (UMS).

Including Late Payment Fees in Invoices

If you are generating the final invoice document by using the BRM-BI Publisher integration framework, you can customize the invoice data generated in XML format to include the late payment fee. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

To include late payment fees in the invoice data generated in XML format:

1. Extend the **/item** storable class to include **/item/late_fee**. See "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide*.
2. Open the *BRM_home*/**sys/data/pricing/example/config_item_types.xml** file and define a type for the item. For example:

```
<ItemTypeElement>
    <ItemTag>LateFee</ItemTag>
    <ItemDescription>Late_Fee</ItemDescription>
    <ItemType precreate="false" type="cumulative">
    /item/late_fee</ItemType>
</ItemTypeElement>
```

3. Save the file.
4. Run the following command, which loads the configuration item types:

```
load_config_item_types config_item_types.xml
```

5. Open the *BRM_home*/**sys/data/pricing/example/config_item_tags.xml** and define a tag for the new service. For example:

```
<ItemTagElement>
    <ItemTag>LateFee</ItemTag>
    <EventType>/event/billing/late_fee</EventType>
    <ServiceType>/account</ServiceType>
</ItemTagElement>
```

6. Save the file.
7. Run the following command, which loads the configuration item tags:

```
load_config_item_tags config_item_tags.xml
```

Including Finance Charges in Invoices

If you are generating the final invoice document by using the BRM-BI Publisher integration framework, you can customize the invoice data generated in XML format to include the finance charges. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

To include finance charges in the invoice data generated in XML format:

1. Extend the **/item** storable class to include **/item/finance_charges**. See "Creating Custom Fields and Storable Classes" in *BRM Developer's Guide*.
2. Open the *BRM_home*/**sys/data/pricing/example/config_item_types.xml** file and define a type for the item. For example:

```
<ItemTypeElement>
    <ItemTag>FinanceCharges</ItemTag>
    <ItemDescription>Finance_Charges</ItemDescription>
    <ItemType precreate="false"     type="cumulative">/item/finance_
charges</ItemType>
</ItemTypeElement>
```

3. Save the file.
4. Run the following command, which loads the configuration item types:

```
load_config_item_types config_item_types.xml
```

5. Open the *BRM_home*/**sys/data/pricing/example/config_item_tags.xml** and define a tag for the new service. For example:

```
<ItemTagElement>
    <ItemTag>FinanceCharges</ItemTag>
    <EventType>/event/billing/finance_charges</EventType>
    <ServiceType>/account</ServiceType>
</ItemTagElement>
```

6. Save the file.
7. Run the following command, which loads the configuration item tags:

```
load_config_item_tags config_item_tags.xml
```

Aggregating Taxes on Invoices

You can create invoices that aggregate taxes for each tax supplier and, within each tax supplier, for each tax code. By default, taxes are not aggregated on invoices.

To aggregate taxes on your invoices:

1. Open the *BRM_home*/**sys/data/config/bus_params_Invoicing.xml** file in an XML editor.
2. Find the following line:

```
<ADSTTaxHandle>disabled</ADSTTaxHandle>
```

3. Change **disabled** to **enabled**.

> **Caution:** BRM uses the XML in this file to overwrite the existing invoicing instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM configuration.

4. Save the file and rename it **bus_params_Invoicing.xml**.
5. Run the following command, which loads this change into the **/config/business_ params** object:

```
pin_bus_params bus_params_Invoicing.xml
```

   Run this command from the *BRM_home*/**sys/data/config** directory, which includes support files used by the utility. To run it from a different directory, see "pin_bus_ params" in *BRM Developer's Guide*.

6. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct. See "Reading an Object and Fields" in *BRM Developer's Guide*.

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

7. Stop and restart the CM. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
8. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

Specifying Invoice Data from Pipeline Manager and Custom Applications

If you process events that originate in Pipeline Manager or a custom application, you can create a template to specify the event invoice data so that it can be included in your invoices.

BRM provides a default template file (**pin_invoice_data_map**) located in *BRM_home*/**sys/data/config**. This file includes a default **INTEGRATE** template for Pipeline Manager invoice data. You can modify the **INTEGRATE** template or add new templates to the file.

To use this feature, you must do the following:

- Load the new invoice data template. See "Loading the Invoice Data Map Templates".
- Enable event caching in the CM configuration file. See "Enabling Event Caching".
- Configure the output module to add invoice data. See "Adding Invoice Data to Pipeline Output".

Using Data Map Templates

Templates in the **pin_invoice_data_map** file define the fields in invoice data records. If you use different invoice record formats, you can create a template for each record format. The data map file can include any number of templates.

When you define templates, you specify the BRM flist fields that map to the invoice record fields. When the invoice data is processed, the fields are passed in an flist to the invoicing opcodes for processing.

The default **INTEGRATE** template defines Pipeline Manager invoice data. You can modify the **INTEGRATE** template or create new templates.

To create or modify templates in the **pin_invoice_data_map** file:

1. Open the *BRM_home*/**data/config/pin_invoice_data_map** file.
2. Change the **INTEGRATE** template or add a new template to the end of the file. Use the following syntax:

```
ID template_name
field_level   field_name
field_level   field_name
field_level   field_name
...
```

where:

– *template_name* is the name of the template.

– *field_level* is the level of the field in the flist.

– *field_name* is the associated BRM field.

For example:

```
ID INTEGRATE
0 PIN_FLD_CALLING_NUMBER
0 PIN_FLD_CALLED_NUMBER
. . .
0 PIN_FLD_BAL_IMPACTS
1 PIN_FLD_RATE_TAG
1 PIN_FLD_AMOUNT
```

3. Save and close the file.

The order of the fields in the template must correspond to the order of the fields in the invoice record. Any custom invoice data records that you process must follow these rules:

- Fields must be separated by a pound symbol: **#**
- Arrays and substructs must be enclosed in angle brackets: **< >**
- Each balance impact element must end with a pipe symbol: **|**

Note: The pipe is optional after the last element.

- The first field in the record must be the name of the corresponding invoice data template and be preceded by the @ symbol.

  For example: **@INTEGRATE**

- The template name in the record must match the template name in the **load_pin_invoice_data_map** file.

Loading the Invoice Data Map Templates

After defining invoice data map templates, load them into the BRM database.

Caution: When you run **load_pin_invoice_data_map**, it overwrites the existing invoice data templates. If you are updating a set of templates, you cannot load new templates only. You must load complete sets of invoice data templates each time you run **load_pin_invoice_data_map**.

Important: To connect to the BRM database, **load_pin_invoice_data_map** 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*.

If you defined a custom field for invoicing, you must add the full path name of the mapping file to the **load_pin_invoice_data_map** utility's **pin.conf** file. For more information, see "Making Custom Fields Available to Your Applications" in *BRM Developer's Guide*.

To load the data map templates:

1. Go to the directory that contains the utility's configuration file.
2. Run the following command, which loads the data map template:

```
load_pin_invoice_data_map -d -v pin_invoice_data_map
```

Enabling Event Caching

Pipeline Manager caches invoice data before sending it to BRM for processing. Therefore, you must enable event caching to include Pipeline Manager invoice data in your invoices.

To enable event caching:

1. Open the CM configuration file (*BRM_home***/sys/cm/pin.conf**).
2. Set the **event_cache** entry to **1**:

```
- fm_inv event_cache 1
```

3. Save and close the file.

Adding Invoice Data to Pipeline Output

To add data from a pipeline to your invoices, configure the OUT_GenericStream module to add the data to the BRM billing record.

To output invoice data, add the following registry parameter to all OUT_GenericStream modules:

```
AddInvoiceData = TRUE
```

This parameter is read by the output grammar. When set to **TRUE**, the output module adds invoice data to each BRM billing record.

For more information about OUT_GenericStream module registry entries, see "OUT_GenericStream" in *BRM Configuring Pipeline Rating and Discounting*.

About Formats for Storing Invoices

BRM stores each invoice as an object in the database. By default, BRM stores invoices in the same database schema it stores the accounts you are invoicing. But BRM can also store invoices in a separate schema. For information on how to store invoices in a separate schema, see "Storing Invoices in a Separate Database Schema".

You must store invoices in at least one of two formats:

- **pin_flist**: The internal BRM data structure. By default, BRM stores invoice data in this format and then reformats it into HTML format to display in the Invoice Viewer.

  This is the most useful format for the following reasons:

  - Customer Center and Self-Care Manager require pin_flist storage format to display HTML invoices.
  - All the available display options work with invoices stored in pin_flist format.
  - You can write a program that saves the pin_flist invoices in any other format. This is useful to provide invoice data to third-party invoice viewers. For

information on the pin_flist format, see "Understanding Flists and Storable Classes" in *BRM Developer's Guide*.

- **XML**: You might use this storage format if you are using XML to design and display invoices. You use this format if you are generating the final invoice document by using the BRM-BI Publisher integration package. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

  To use XML as an alternative or additional storage format, modify the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode.

  Note: You can store invoice data in pin_flist and XML formats at the same time. To store invoice data in multiple formats, modify the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode. If you use XSL style sheet, you can store the invoice data in pin_flist format and use Customer Center to display invoices.

You have the option of also storing invoices in HTML or DOC1 format. These are primarily display formats, and, in most cases, storing invoices in these formats is not useful. But you might need to store invoices in the same format you use to display them.

Storing invoices in HTML or DOC1 format requires extensive programming. Use the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode.

Storing Invoices in a Separate Database Schema

Important: Storing invoices in a separate database schema is supported only on Oracle databases.

By default, your invoices are stored in the same database schema that contains the invoiced accounts. However, using a separate schema to store invoices provides the following benefits:

- Speeds up the invoicing process.
- Potentially stores a large number of invoices.
- Enables you to view, email, and print invoices without affecting performance of the main schema.

The procedures for storing invoices in a separate schema include the following:

1. Installing the Invoice Data Manager
2. Configuring BRM to Use a Separate Invoice Database Schema
3. Configuring Invoice Applications to Use a Separate Invoice Database Schema
4. Starting the Invoice Data Manager

Installing the Invoice Data Manager

Important: The Invoice Data Manager (DM) is supported only on Oracle databases.

The Invoice DM is not installed by default when you install BRM.

To install the Invoice DM:

1. Make sure you have a separate database schema installed and available to use for storing invoices.

   See "Installing a Multischema System" in *BRM Installation Guide* and "Adding Database Schemas to a Multischema System" in *BRM System Administrator's Guide*.

2. Copy the **dm_oracle** binary as **dm_invoice** in *BRM_home*/**bin** directory by running the **cp** command. For example:

   ```
   cp BRM_home/bin/dm_oracle BRM_home/bin/dm_invoice
   ```

3. Open the *BRM_home*/**setup/pin_setup.values** file in a text editor.

4. Add **"dm_invoice"** to the **@COMPONENT_LIST** line:

   ```
   @COMPONENT_LIST = ("dm_oracle", "dm_invoice", "cm");
   ```

   Important: Make sure **"dm_invoice"** appears after **"dm_oracle"**.

5. Modify the entries in the **pin_setup.values** file shown in Table 1–4:

Table 1–4 Entries to be Modified in pin_setup File

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 any other schema in the database.
$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.
$DM_INVOICE{'db_num'}	Must contain the database schema number of the invoice database.

6. Install the Invoice DM by doing one of the following:

   - To install all BRM components, run this script:

     Note: Before running the **pin_setup** script, make sure that the database flags are set to **NO**.

     BRM_home/**setup/pin_setup**

   - To install only the Invoice DM, run this script:

     BRM_home/**setup/scripts/pin_cmp_dm_invoice.pl**

For the complete installation procedure, see "Installing BRM" in *BRM Installation Guide*.

Configuring BRM to Use a Separate Invoice Database Schema

You must configure the CM to use the Invoice DM and separate invoice database schema.

To configure the CM:

1. On the machine that contains the CM, open the CM configuration file (*BRM_home*/**sys/cm/pin.conf**).
2. In the **invoice_db** entry, enter the invoice database schema number.

   For example:

   ```
   - fm_cust_pol  invoice_db 0.0.6.1 /invoice 0
   ```

   0.0.6.1 is the BRM default database schema number for the invoice schema.

   The customer Facilities Module (FM) uses this entry to store the invoice database schema numbers for new customers. BRM uses that information to store the invoices each time you generate invoices.

   Note: The invoicing utilities do not use this entry.

3. Make sure you have a **dm_pointer** entry for the invoice schema referenced in the **invoice_db** entry. The **pin_inv_accts** utility uses this entry.

   For more information, see the documentation in the CM configuration file.
4. Make sure you have a **dm_attributes** entry for the invoice schema:

   ```
   - cm dm_attributes 0.0.6.1 assign_account_obj,searchable
   ```

   For more information, see the documentation in the CM configuration file.
5. Save and close the file.
6. Stop and restart the CM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Configuring Invoice Applications to Use a Separate Invoice Database Schema

To use a separate database schema for storing invoices:

1. Open the invoice configuration file (*BRM_home*/**apps/pin_inv/pin.conf**) in a text editor.
2. In the Invoice DB number section for the **pin_inv_send** and **pin_inv_export** applications, change the **invoice_db** parameter value to your invoice database schema number. The following examples use the BRM default invoice database schema number, **0.0.6.1**:

   ```
   - pin_inv_send invoice_db 0.0.6.1 /invoice 0
   - pin_inv_export invoice_db 0.0.6.1 /invoice 0
   ```

3. Save and close the file.

Starting the Invoice Data Manager

To start the Invoice DM, run the **pin_ctl start dm_invoice** command.

For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Configuring the Invoice pin.conf for Multiple Database Schemas

In a multischema environment, to store invoices in the database schema 0.0.0.2:

1. Open the invoice configuration file (*BRM_home*/**apps/pin_inv/pin.conf**).
2. Change the login name in the following entry to your login name:

   ```
   - nap login_name name
   ```

3. Change the **database** parameter value to **0.0.0.2** in the following entries:

   ```
   - pin_inv_accts database 0.0.0.2 /search 0
   - pin_inv_send database 0.0.0.2 /search 0
   - pin_inv_export database 0.0.0.2 /search 0
   ```

4. Save and close the file.

For information on running invoice utilities in a multischema environment, see "Setting Up Invoicing on Multiple Database Schemas".

Displaying Invoices

BRM provides the following options for displaying invoices:

- The Invoice Viewer in Customer Center. See the discussion about reviewing an invoice in the Customer Center Help.
- Self-Care Manager customer self-care Web pages.
- Sample XML invoice viewing utility (**pin_inv_view.pl**).
- BI Publisher client, if you use the BRM-BI Publisher integration framework to generate invoice documents.

You can also use a third-party viewer to display invoices. For information on how to format and view invoices, refer to the viewer's documentation.

Note:

- You cannot change invoice information in the Invoice Viewer.
- A physical invoice is generated to request payment from each account that has a payment method of Invoice. If your BRM system is properly configured, you can see the invoice files that are stored in the BRM database for accounts with other payment methods.

Using Web Pages

If you use Self-Care Manager, your customers can also display their invoices on your customer self-care Web site. See "Setting Up Customer Self Care with Self-Care Manager" in *BRM Managing Customers*.

Using the XML Sample Invoice Viewing Utility

You can use the **pin_inv_view.pl** utility to view your invoices in XML by using the BRM sample style sheet or any other style sheet you specify. This utility uses Perl and CGI to display invoices you select in any XML-capable browser.

To use this utility, go to the *BRM_home*/**source/apps/sampleviewer** directory. You need to run **make** to build **pin_inv_view.pl**.

Customizing the Format for Online Invoices

To display invoices, use the PCM_OP_INV_VIEW_INVOICE opcode.

This opcode uses the POID of the **/bill** object or **/invoice** object to locate and retrieve a specific invoice. Specify the output format of the invoice as a mime type in the PIN_FLD_TYPE_STR field in the input flist. If you provide the bill number in PIN_FLD_BILL_NO, the opcode searches the bill database and, if necessary, the **history_bills** objects.

PCM_OP_INV_VIEW_INVOICE performs the following tasks:

- Uses the PIN_FLD_THRESHOLD_UPPER value in the input flist to determine the maximum size (KB) of the invoice to be viewed. If the invoice is larger than the size specified, an error message and the invoice size, rather than the invoice itself, is displayed.
- Checks the following fields in the **/invoice** object:
  - PIN_FLD_INV_SIZE to determine the size of the invoice.

    If the invoice size is greater than the invoicing threshold value, PCM_OP_INV_VIEW_INVOICE does not try to format the invoice.

    If the invoice size is less than the invoicing threshold, PCM_OP_INV_VIEW_INVOICE continues processing.
  - PIN_FLD_INV_FLAGS to determine the type of invoice to view. See "Defining the Invoice Type".
  - PIN_FLD_TYPE_STR to determine whether the format specified is stored in the object. Invoices can be stored in the database in pin_flist, XML, HTML, or DOC1 format.

    If the specified format is stored, the invoice is retrieved and returned in the format specified. If the specified format is not stored, the PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode is called to attempt to format the invoice. Invoices can use HTML, XML, or DOC1 format. To apply an XSL style sheet to the invoice, specify the XSL mime type in the PIN_FLD_TYPE_STR field.

If successful, PCM_OP_INV_VIEW_INVOICE returns a buffer containing the formatted invoice. The PIN_FLD_RESULT value in the output flist is **1**.

If not successful due to system errors, no invoice is returned. The PIN_FLD_RESULT value is **0**.

If not successful because the invoice exceeded the threshold size, the PIN_FLD_RESULT value is **2**.

Customizing the Format for Printed Invoices

To format invoices for printing, use the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode.

This policy opcode is called when invoices are generated to specify if the invoices are to be stored in XML or pin_flist format in the **/invoice** object. The default is XML.

- If the storage format is specified as XML or pin_flist, the return flist contains only the specified format type.
- If you customize this policy opcode to generate other formats, the return flist contains the format type along with a buffer containing the formatted invoices.

Any customization of invoice content done by the PCM_OP_INV_POL_PREP_INVOICE policy opcode is passed to the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode prior to storage.

You can customize the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode to generate other storage formats. For example, to store invoices in HTML format, you can add code to call the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode and then add the formatted invoice to the buffer in the output flist.

Customizing the Format for HTML Invoices

To format invoices in HTML, use the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode.

This policy opcode is called by the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode when the invoice format requested is HTML.

If your system has the invoicing-by-service feature enabled, the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode will display the invoice items by service instance. If your system is brand enabled, this policy opcode caches all **/config/invoice_events** objects associated with the specific brand. Otherwise, only the **/config/invoice_events** object belonging to the root account is cached.

Customizing the Format for XML Invoices

To format invoices in XML, use the PCM_OP_INV_POL_FORMAT_INVOICE_XML policy opcode.

This opcode is called by the PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode when the invoice format requested is XML.

Customizing the Invoice Format by Using an XSL Style Sheet

To format invoices using an XSL style sheet, use the PCM_OP_INV_POL_FORMAT_INVOICE_XSLT policy opcode.

You can brand invoices by using brand-specific XSL style sheets.

To specify the use of XSL style sheets, set the PIN_FLD_FLAGS field in the **/config/invoice_templates** object to **1**.

This opcode is called by the PCM_OP_INV_POL_FORMAT_INVOICE policy opcode when the **/config/invoice_templates** object specifies an XSL style sheet.

For more information about loading and editing XSL style sheets, see "Using XSLT Invoice Templates".

Customizing the Format for DOC1 Invoices

To format invoices for DOC1, use the PCM_OP_INV_POL_FORMAT_INVOICE_DOC1 policy opcode.

Important: For DOC1 format, you must have the DOC1 software.

This opcode also checks the **pin.conf** file to see whether your system has service-centric invoicing turned on. If invoicing by service is enabled, this opcode reorganizes the flist so that it displays the invoice items by service instance.

If your system has the invoicing-by-service feature enabled, the PCM_OP_INV_POL_FORMAT_INVOICE_DOC1 policy opcode displays the invoice items by service instance.

Displaying an Invoice on Demand

To display an invoice on demand, use the PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode. This policy opcode generates an invoice in the specified format.

BRM can store the invoice in the database in either pin_flist or XML format. The default is pin_flist. The storage format is specified by the PCM_OP_INV_FORMAT_VIEW_INVOICE opcode.

The PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode is called when PCM_OP_INV_VIEW_INVOICE requests an invoice in a format that is not stored on the **/invoice** object. This opcode attempts to generate the invoice in the requested format. Invoices may be formatted as HTML or DOC1. An XML format is also available, but it displays as HTML format.

The PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode calls one of the following policy opcodes, depending on the requested format:

- PCM_OP_INV_POL_FORMAT_INVOICE_HTML
- PCM_OP_INV_POL_FORMAT_INVOICE_DOC1
- PCM_OP_INV_POL_FORMAT_INVOICE_XML
- PCM_OP_INV_POL_FORMAT_INVOICE_XSLT

The PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode checks the PIN_FLD_FLAG field in the **/config/invoice_templates** object to see whether an XSL style sheet should be applied to the invoice. If the flag is set, the PCM_OP_INV_POL_FORMAT_INVOICE_XSLT policy opcode is called to format the invoice.

The PCM_OP_INV_POL_FORMAT_VIEW_INVOICE policy opcode also checks the **pin.conf** file to see whether your system has service-centric invoicing turned on. If invoicing by service is enabled, this policy opcode reorganizes the flist so that it displays the invoice items by service instance. See "Creating Service-Centric Invoices".

Note: Because the flist is reorganized, if you apply an XSL style sheet to the invoice, you may need to change the style sheet to reflect the change in output created by the service instance organization.

Understanding Invoice Layout

The invoice examples used here are based on the invoice template for individual accounts provided in the BRM-BI Publisher integration.

Note: By default, the invoice document presents charges in primary currency. However, all the relevant charges details are available in secondary currency in the **/invoice** object. You can customize the RTF files associated with the layout templates to display the charges details in secondary currency.

The layout of a typical invoice generated using the BRM-BI Publisher integration displays details in the following sections:

Standard Details

This section of the invoice includes the following information:

- Basic bill information, such as invoice date, invoice number, account number, due date, and bill period. The invoice displays this bill-related information on all the pages.
- Customer information, such as name and billing address. For hierarchy accounts, the invoice displays parent account information in this section.
- Amount due, which is a sum of past amount due, current charges, payments, and adjustments.
- Summary of current charges, which is a sum of different types of service usage charges, other charges and credits, and taxes and surcharges. If a customer has used different types of services, such as GSM and ADSL, this section displays the summary of current charges for GSM and ADSL services separately.
- A URL for online payments and a support phone number to resolve customer queries.
- Payment slip, which the customer needs to detach from the invoice and returns when making the payment.

  Figure 1–1 shows the standard data in a typical invoice:

Figure 1–1 Typical Invoice

ORACLE

INVOICE

John Duo
CA
Cupertino
CA, 95014

Invoice Date : 06/19/2009
Invoice No. : B1-2
Account No. : 0.0.0.1-147792
Due Date : 07/17/2009

Bill Period: 05/17/2009 To 06/17/2009

Past Due Amt	Current Charges	Payments	Adjustments	Amount Due (E)
478.04	233.99	0.00	(82.00)	624.68

Summary of Current Charges	Amount (E)
Service: SMS	15.50
Service: TELEPHONY	94.88
Taxes & Surcharges	6.00
Total Current Charges	**116.38**
Other Charges and Credits	(5.35)

Pay on the web	Questions
My Account at www.oracle.com	1.800.555.7645

Your Payment Slip (Please attach this Payment slip along with your payment)			
Name	John Duo		
Bill No. B1-2	Bill Date 06/17/2009	Total Amounts 624.68 (E)	Due Date 07/17/2009

Adjustment, Payment, Promotion, and Other Charges and Credits Details

This section of the invoice includes the following details:

- **Adjustment details:** This section displays the adjustments that the customer service representative (CSR) performs on the customer account. The invoice displays the type of adjustment, date on which the adjustment was done, amount adjusted, and the reason for adjustment.
- **Payment details:** This section displays the payment type, date on which payment is made, payment amount, and the reason for the payment. For example, if the customer has made a cash payment of $15, the **Amount** column displays **(15)**.
- **Promotion details:** This section displays a list of promotions offered by the service provider. It displays promotion-related details, such as promotion name, promotion validity period, and current status of promotion. For more information on promotions, see "Adding Siebel CRM Promotion Names to Invoices".
- **Other charges and credits details:** This section displays information related to dispute, refund, settlement, write-off, and write-off reversal.

  Figure 1–2 shows the adjustment, payment, promotion, and other charges and credits details in a typical invoice:

Figure 1–2 Adjustment Details and Other Charges and Credits on Invoice

ORACLE

Page	: 3 of 6
Bill Date	: 06/17/2009
Invoice No.	: B1-2
Account No.	: 0.0.0.1-147792

Adjustment Details

Type	Date	Amount (E)	Reason
Item	05/18/2009	(10.00)	Item Adjustment
Account	05/18/2009	(2.00)	Event for Account Adjustment
Item	05/18/2009	(40.00)	Item Adjustment
Account	05/25/2009	(10.00)	Event for Account Adjustment
Account	05/25/2009	(20.00)	Event for Account Adjustment

Other charges and Credits

Ref No.	Name	Date	Amount (E)	Description
D1-1	Dispute	05/18/2009	0.50	Event Dispute
D1-1	Dispute	05/18/2009	(5.00)	Event Dispute
S1-1	Settlement	05/25/2009	0.00	Event Settlement
S1-1	Settlement	05/25/2009	0.00	Event Settlement
W1-1	Write-off	05/25/2009	(0.85)	Item Writeoff

Charge Details

For consumer accounts, this section of the invoice displays the usage charge details for a particular phone number. If the user has multiple phone numbers, there are different sections for each phone number; each section displays the charge details corresponding to that number. In a hierarchy, for a parent account, the invoice displays the total charges for each subordinate account.

This section of the invoice also displays plan, service, deal, and product details used by the customer.

> **Note:** If no device (phone number) is associated with a service, the charge details are displayed under **Non Device details** section.

- **Resource Details:** Includes the details of noncurrency resources available for a service type. For example, it can display the number of free seconds available for the GSM telephony service type.
- **Charge Summary:** Displays total charges, which is a sum of recurring charges, one-time charge, taxes and surcharges, and total discounts.
- **Usage Summary:** Displays the service usage for different services.

  After summary information section, the invoice displays itemized usage details based on service type. For example, for telephony and SMS services used, the invoice displays two sections for telephony and SMS usage. By default, the invoice

displays the rounded-off value of event data record (EDR) usage. To display the exact usage duration in the invoice, you can customize the product so that the usage event is populated with the exact net quantity.

Note: The discount and tax break-up details are available in the invoice data generated in XML format. However, the invoice document in PDF does not display these details in the Usage Summary section.

Figure 1–3 shows the charge details for a particular number in a typical consumer invoice:

Figure 1–3 Charge Details in Invoice

Charge Details for no. 0049100050

Service Name: SMS
Plan Name: Standard GSM_modified
Deal Name: Standard SMS
Product Name: Standard SMS
Service Name: TELEPHONY
Plan Name: Standard GSM_modified
Deal Name: Standard GSM Telephony
Product Name: Standard GSM Telephony
Discounts Name: Standard GSM Discount

Resource Details

Service: TELEPHONY

Free Seconds	(3,600)

Charge Summary	**Date**	**Amount (E)**
Recurring Charges		**65.00**
Cycle Forward Fees (srvc): Standard SMS	06/17/2009	15.00
Cycle Forward Fees (srvc): Standard GSM Telephony	06/17/2009	50.00
Usage Total		**167.99**
Taxes & Surcharges		**6.00**
Total Discounts		**(5.00)**
Discount : Cycle Forward Fees (srvc): Standard GSM Telephony	06/17/2009	(5.00)
Total Charges (E)		**233.99**

Usage Summary

Usage (E)	**45.38**
Service: SMS	0.50
Service: TELEPHONY	44.88

Usage Details

Service: SMS

Date	Time	Send To	Duration/Quantity	Rate Tag	Amount (E)
04/20/2009	23:13:00	004941067600	1	NA	0.05
04/22/2009	23:13:00	004941067600	1	NA	0.05
04/23/2009	23:13:00	004941067600	1	NA	0.05
04/24/2009	23:13:00	004941067600	1	NA	0.05
04/25/2009	23:13:00	004941067600	1	NA	0.05
04/26/2009	23:13:00	004941067600	1	NA	0.05
04/28/2009	23:13:00	004941067600	1	NA	0.05
04/29/2009	23:13:00	004941067600	1	NA	0.05
04/30/2009	23:13:00	004941067600	1	NA	0.05
05/02/2009	23:13:00	004941067600	1	NA	0.05

Service: TELEPHONY

Date	Time	Called To	Duration/Quantity	Rate Tag	Amount (E)
04/20/2009	23:13:00	004941067600	4020	NA	8.04
04/22/2009	23:13:00	004941067600	4020	NA	8.04
04/23/2009	23:13:00	004941067600	420	NA	0.84
04/24/2009	23:13:00	004941067600	4020	NA	8.04
04/25/2009	23:13:00	004941067600	4020	NA	8.04
04/26/2009	23:13:00	004941067600	480	NA	0.96
04/28/2009	23:13:00	004941067600	480	NA	0.96
04/29/2009	23:13:00	004941067600	480	NA	0.96
04/30/2009	23:13:00	004941067600	420	NA	0.84
05/02/2009	23:13:00	004941067600	4080	NA	8.16

Sending Invoices to Customers

After generating invoices, you email or print them by using a separate application.

You can also make invoices available on your customer self-care Web site for customers to view. See "Setting Up Customer Self Care with Self-Care Manager" in *BRM Managing Customers*.

Use the **pin_inv_send** utility to email electronic invoices or to send printed invoices to your customers. This utility determines whether to email or print an invoice by checking an account's delivery method. The delivery method is set by a CSR in the Payment Setup panel of Customer Center. There are two possible delivery methods:

- **Email**: **pin_inv_send** emails the invoice.
- **Postal**: **pin_inv_send** prints the invoice.

By default, this utility sends invoices in HTML format. You can also specify DOC1 format. For more information, see "pin_inv_send".

Setting the Maximum Invoice Size for Email

To set the maximum size of invoices that can be sent by email:

1. Open the invoice configuration file (*BRM_home*/**apps/pin_inv/pin.conf**).
2. Set the value of the **inv_send_size** entry in kilobytes and make sure it is not commented.

   This entry is used by PCM_OP_INV_VIEW_INVOICE to restrict sending large invoices to the Email DM (**dm_email**).
3. Save and close the file.

Sending Child Account Invoices to the Parent Account's Email Address

By default, invoices for the subordinate bill units in an account hierarchy are consolidated into the invoice for the paying bill unit of the parent account and sent to the parent account's email address. To handle cases where the parent account's invoice is not consolidated and individual invoices exist for each subordinate bill unit, you can configure **pin_inv_send** to send all subordinate bill unit invoices to the email address of parent account's invoice:

1. Open the invoice configuration file (*BRM_home*/**apps/pin_inv/pin.conf**).
2. Change the value of the **send_sub_inv_2_parent** entry to **1** and make sure it is not commented.
3. Save and close the file.

Configuring the Email Data Manager for Printing

You can use the third-party tool, HTML to PostScript converter (**html2ps**), to print invoices. Follow these instructions to download the **html2ps** tool and to configure the Email DM for printing invoices:

1. Download from the Internet and install the **html2ps** converter tool.
2. Open the Email DM configuration file (*BRM_home*/**sys/dm_email/pin.conf**).
3. In the **html2ps** entry, enter the path to the **html2ps** tool.

   For example:

```
- dm_email html2ps path_to_html2ps_tool
```

4. In the **printer** entry, enter the name of your printer:

```
- dm_email printer printer_name
```

5. In the **tmp_dir** entry, enter the name of the directory where BRM saves temporary HTML and PostScript files when the **send** utility runs. For example:

```
- dm_email tmp_dir /tmp
```

6. Save and close the file.
7. Stop and restart the Email DM. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Sending Invoices to Accounts That Use the Invoice Payment Method

To email or print invoices for bills that use the Invoice payment method:

1. If you store invoices in a separate database schema, enter the database schema number in the invoicing configuration file (*BRM_home*/**apps/pin_inv/pin.conf**). For example:

```
- pin_inv_send invoice_db 0.0.0.2 /invoice 0
```

   Then follow the procedures in "Storing Invoices in a Separate Database Schema".

2. Start the Email DM See "Sending Email to Customers Automatically" in *BRM Managing Customers*.
3. Go to a directory with a valid invoicing configuration file. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide*.
4. Run the following command:

```
pin_inv_send
```

   For a detailed description of this utility's syntax and parameters, see "pin_inv_send".

Sending Invoices to Accounts That Do Not Use the Invoice Payment Method

To email or print invoices for non-invoice bill units, run the **pin_inv_send** utility with the **pay_type** parameter:

```
pin_inv_send -pay_type id
```

where *id* is one of the payment methods shown in Table 1–5:

Table 1–5 Payment Method IDs

Payment Method	ID
Undefined	0
Prepaid	10000
Invoice	10001
Debit	10002
Credit card	10003
Direct debit	10005

Table 1–5 (Cont.) Payment Method IDs

Payment Method	ID
Smart card	10006
Subordinate In Customer Center this is called *nonpaying*.	10007
Beta	10008
Internal	10009
Guest	10010
Cash	10011
Check	10012
Wire transfer	10013
Payorder	10014
Postal order	10015
Voucher	10016
SEPA	10018

Exporting Invoices

You can export the invoices in your database to files in any of the following formats: pin_flist, XML, HTML, or DOC1.

In addition, you can export detailed invoices for accounts that are set up to receive summary invoices and you can export invoices for a list of bills in an external file.

> **Note:** If you use DOC1 invoice software, you can export BRM invoices in DOC1 format, and then open them in the DOC1 program.

To export invoices to files:

1. Open the invoicing configuration file (*BRM_home*/**apps/pin_inv/pin.conf**) and find the **pin_inv_export** entries.
2. If you are exporting to a format other than **pin_flist**, edit the **invoice_fmt** entry. Enter one of the following that corresponds to the format you want to use for the invoice files:
   - **text/pin_flist**
   - **text/xml**
   - **text/html**
   - **text/doc1**

   For example, to create HTML invoice files, enter:

   ```
   - pin_inv_export  invoice_fmt text/html
   ```

   If you do not edit this entry, **pin_inv_export** creates files in **pin_flist** format.
3. In the **export_dir** entry, enter the directory in which you want to store the files. You can enter a complete path or a path relative to the directory where you run **pin_inv_export**:

```
- pin_inv_export  export_dir ./invoice_dir
```

4. Change to a directory with a valid invoicing configuration file. See "Creating Configuration Files for BRM Utilities" in *BRM System Administrator's Guide*.
5. Run the following command:

   pin_inv_export

   Running **pin_inv_export** with no parameters creates a separate file for each invoice in the database.

   > **Tip:** You can specify a date range to export only invoices created on certain dates.

   To generate trial invoices, run the following command:

   pin_inv_export -verbose -trial

   To generate detail invoices, run the following command:

   pin_inv_export -verbose -detail *filename*

   where *filename* is the name of the file that specifies the bills for which invoices are to be generated.

   > **Important:** When exporting invoices for parent A/R accounts, and the invoices for the subordinate bills were not consolidated into the A/R account's invoice, a separate invoice file for each subordinate bill unit and the A/R bill unit is exported.
   >
   > The file-naming convention is *accountPOID_billPOID_date.ext*.
   >
   > If a subordinate invoice or parent invoice fails during generation, subordinate invoices are not exported.

   > **Note:** To determine which invoice file is the parent account invoice, customize the appropriate invoice format policy opcode to generate another file containing the parent invoice file name for a given bill.

   For a description of this utility's syntax and parameters, see "pin_inv_export".

Setting Invoicing Defaults

You can specify the following system defaults for invoices:

- Payment due date. See "Setting the Default Payment Due Date".
- Invoice type. See "Setting the Default Invoice Type".
- Hierarchical group settings. See "Setting Defaults for Hierarchical Group Invoices".
- Maximum invoice size viewable in Customer Center. See "Setting the Maximum Size of Invoices Viewable in Customer Center".

Setting the Default Payment Due Date

The default payment due date for invoice payments is 30 days from the billing date. To change the default, customize the PCM_OP_CUST_POL_PREP_PAYINFO policy opcode.

Setting the Default Invoice Type

The PIN_FLD_INV_DETAIL field in the **/payinfo** object contains the invoice value: detailed (**0**) or summary (**1**). You can set this value by passing the value in the PIN_FLD_INV_TYPE field in the input flist of:

- PCM_OP_CUST_COMMIT_CUSTOMER when creating a customer account.
- PCM_OP_CUST_SET_PAYINFO when changing a customer's payment information.

Setting Defaults for Hierarchical Group Invoices

BRM automatically generates invoices for the parent bill unit and each subordinate bill unit in an account hierarchy. For example, if an account hierarchy contains two subordinate bill units, BRM generates three invoices: one for the parent bill unit and one for each subordinate bill unit.

You can configure whether invoices for parent bill units also include information from subordinate bill units by modifying fields in the **invoicing** instance of the **/config/business_params** object. Specifically, you can configure the following:

- Whether subordinate A/R items are displayed on a parent A/R account's invoice.
- The maximum number of subordinate bill units that can be included in a parent A/R account's summary invoice.

  When the number of subordinate bill units is less than the maximum, all subordinate bill units are included on the parent's summary invoice. When the number of subordinate bill units exceeds the maximum, none of the subordinate bill units is included on the parent's invoice.
- The maximum number of subordinate bill units that can be included in a parent A/R account's detailed invoice.

  When the number of subordinate bill units is less than the maximum, the parent's detailed invoice lists the items and events for all subordinate bill units. When the number of subordinate bill units exceeds the maximum, the parent's detailed invoice does not include subordinate bill unit data.

To specify whether subordinate details are displayed on parent invoices:

1. Run the following command, which creates an editable XML file for the Invoicing parameter class:

   ```
   pin_bus_params -r -c "BusParamsInvoicing" bus_params_Invoicing.xml
   ```

   This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. If you do not want this file in your working directory, specify the full path as part of the file name.
2. (Optional) Specify whether to display A/R items for each subordinate bill unit on parent invoices:

Set the **SubArItemsIncluded** entry to **enabled** to display subordinate A/R items on parent invoices and to **disabled** to display only parent A/R items on parent invoices.

```
<SubARItemsIncluded>enabled</SubARItemsIncluded>
```

3. (Optional) Set the threshold for summary invoices:

   Search the XML file for the following line and change **0** to the number of subordinate bill units allowed in a parent's summary invoice:

   ```
   <ThresholdSubordsSummary>0</ThresholdSubordsSummary>
   ```

   If the threshold value is exceeded, the parent A/R account summary invoice will not contain the subordinate bill unit data.

   > **Note:** A value of **0** means that BRM does not check the size of the account hierarchy and the parent's A/R account summary invoice automatically includes all subordinate bill unit data.

4. (Optional) Set the threshold for detailed invoices:

   Search the XML file for the following line and change **0** to the number of subordinate bill units allowed in a parent's detailed invoice:

   ```
   <ThresholdSubordsDetail>0</ThresholdSubordsDetail>
   ```

   If the number of subordinate bill units exceeds the threshold value, the parent's detailed invoice includes only the parent bill unit's details.

   > **Note:** A value of **0** means that BRM does not check the size of the account hierarchy and the parent's A/R account summary invoice automatically includes all subordinate bill unit data.

5. Save the file and rename it to **bus_params_Invoicing.xml**.
6. Run the following command, which loads the change into the **/config/business_ params** object:

   ```
   pin_bus_params bus_params_Invoicing.xml
   ```

   Run this command from the *BRM_home***/sys/data/config** directory, which includes support files used by the utility. To run it from a different directory, see "pin_bus_ params" in *BRM Developer's Guide*.
7. Read the object with the **testnap** utility or the Object Browser to verify that all fields are correct. See "Reading an Object and Fields" in *BRM Developer's Guide*.

You do not need to restart the CM to enable these entries.

For more information on invoicing thresholds, see "About Invoicing for Hierarchical Account Groups".

Setting the Maximum Size of Invoices Viewable in Customer Center

To limit the size of invoices that can be displayed in Customer Center.

> **Important:** Do not modify the default Customer Center properties file (**CustomerCenter.properties**). The parameters and values specified in the **Customized.properties** file take precedence over values for identical parameters in the default properties file.

1. Open the *CCSDK_home*/**CustomerCareSDK/CustCntr/custom/Customized.properties** file in a text editor.
2. Add the following entry to the file:

   ```
   view_invoice_max_size=kilobytes
   ```

   where *kilobytes* is the maximum invoice size.

   This sets the maximum size of an invoice in kilobytes that can be displayed in Customer Center. This value is passed in the input flist of PCM_OP_INV_VIEW_INVOICE. See "Displaying Invoices".
3. Save and close the file.

Setting the Maximum Number of Items in the Search Template

In BRM, you can set the maximum number of items to be retrieved at a time in the PCM_OP_SEARCH and PCM_OP_BULK_WRITE_FLDS search templates; for example, 100 items. The opcodes repeats the search until all the events are searched for the specific items.

You can perform this by setting the **InOperatorSize** parameter in the **invoicing** instance of the **/config/business_params** object.

> **Note:** You can use the **InOperatorSize** parameter with the PCM_OP_SEARCH and PCM_OP_BULK_WRITE_FLDS opcodes only when these opcodes are called by PCM_OP_BILL_CYCLE_TAX and PCM_OP_SUBSCRIPTION_RERATE_REBILL opcodes respectively.

To set the maximum number of items in the search template:

1. Run the following command, which creates an editable XML file for the Invoicing parameter class:

   ```
   pin_bus_params -r -c "BusParamsInvoicing" bus_params_Invoicing.xml
   ```

   This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. If you do not want this file in your working directory, specify the full path as part of the file name.
2. Open the *BRM_home*/**sys/data/config/bus_params_Invoicing.xml** file in an XML editor.
3. Search for the following line:

   ```
   <InOperatorSize>500</InOperatorSize>
   ```

4. Change **500** to a required positive number; for example, **100**.

   The opcode retrieves only the specified number of items at a time.

> **Note:** To avoid errors that may occur due to huge search template, modify the default value **500** to **100** or less.

5. Save the file and rename it to **bus_params_Invoicing.xml**.
6. Run the following command, which loads the change into the **/config/business_ params** object:

   ```
   pin_bus_params bus_params_Invoicing.xml
   ```

   Run this command from the *BRM_home***/sys/data/config** directory, which includes support files used by the utility. To run it from a different directory, see "pin_bus_ params" in *BRM Developer's Guide*.
7. Read the object with the **testnap** utility or the Object Browser to verify that all fields are correct. See "Reading an Object and Fields" in *BRM Developer's Guide*.
8. Stop and restart the CM. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

Adding Siebel CRM Promotion Names to Invoices

Promotions are marketing bundles that contain multiple products and services, often at reduced prices. When customers order promotions, their invoices, by default, display the products and services that come with the promotion, but the invoice does not display the promotion name itself. This could be confusing to customers and make them wonder if they are being billed correctly. If your BRM system uses Siebel CRM and Oracle Application Integration Architecture (Oracle AIA), you can set up your system to display Siebel CRM promotion names on customer invoices.

When your system is configured to display promotion names, customer invoices display all promotions that are active, were inactivated, or were canceled during the billing cycle in which the invoice is generated. For example, if a customer switched from promotion A to promotion B in January, the customer's January invoice would display both promotion A and promotion B.

To manage promotions, your CSRs must be able to perform the following tasks in Siebel CRM:

- Add a promotion to a customer's account.
- Modify a customer's existing promotion.
- Transfer an existing promotion from one account to another.
- Inactivate a customer's existing promotion.
- Cancel a customer's existing promotion.
- Apply promotions to child accounts in an account hierarchy.

> **Note:** Parent accounts can share their promotions with a child account only if the child account owns the products and discounts associated with the parent's promotion.

You implement this functionality by customizing Siebel CRM to send data through Oracle AIA to the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode.

How BRM Adds Siebel CRM Promotion Names

When a customer orders a promotion, CSRs enter information about the order in Siebel CRM, which passes the information through Oracle AIA to BRM. For each promotion ordered by an account, BRM:

- Creates a **/purchased_bundle** object, which stores information about the promotion, such as the promotion's name, validity dates, and status.
- Associates the promotion with the products and discounts it is bundled with by setting the PIN_FLD_PLAN_OBJ field of the account's **/purchased_product** and **/purchased_discount** objects to the **/purchased_bundle** POID.

When BRM generates invoices, it retrieves all of the account's purchased products and discounts (**/purchased_product** and **/purchased_discount** objects) and, if they are associated with a promotion that is active, was inactivated, or was canceled during the current billing cycle, the **/purchased_bundle** object as well.

Setting Up BRM Invoices to Display Siebel CRM Promotion Names

To include Siebel CRM promotion names on BRM invoices, do the following:

- Make sure BRM is configured to display promotion details on invoices. It is configured to display promotion details by default. See "Specifying Whether BRM Displays Promotion Details on Invoices".
- Customize Siebel CRM to pass information to the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode. See "Managing Promotions with Siebel CRM".
- Use an invoice template that displays promotion names and details. See "Using Invoice Templates That Display Promotion Names".

Important: If you configure BRM to exclude plan, deal, and product pricing details from invoices, the invoice will not display Siebel CRM promotion names. See "Improving Performance by Removing Invoice Details You Do Not Need".

Specifying Whether BRM Displays Promotion Details on Invoices

When BRM generates invoices, it performs, by default, an additional search for any promotion details associated with each account. All promotion details that are found are stored in the account's **/invoice** object and displayed on the invoice.

You can enable and disable this search for promotion details by modifying a field in the **invoicing** instance of the **/config/business_params** object.

- When the search for promotion details is enabled, BRM searches for and displays on invoices details about the account's current promotions.
- When the search for promotion details is disabled, promotion details are not displayed on invoices.

To specify whether BRM invoices display Siebel CRM promotion names:

1. Open the *BRM_home*/**sys/data/config/bus_params_Invoicing.xml** file in an XML editor.
2. Edit the <**PromotionDetailDisplay**> element in the XML file:
   - Use **disabled** to disable the search for promotion details.
   - Use **enabled** to enable the search for promotion details.

```
<PromotionDetailDisplay>enabled</PromotionDetailDisplay>
```

> **Caution:** BRM uses the XML in this file to overwrite the existing invoicing instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM configuration.

3. Save and close the file.
4. Run the following command, which loads this change into the **/config/business_ params** object:

   ```
   pin_bus_params bus_params_Invoicing.xml
   ```

   Run this command from the *BRM_home*/**sys/data/config** directory, which includes support files used by the utility. To run it from a different directory, see "pin_bus_ params" in *BRM Developer's Guide*.
5. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct. See "Reading an Object and Fields" in *BRM Developer's Guide*.

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

6. Stop and restart the CM. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
7. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

Managing Promotions with Siebel CRM

To add, modify, inactivate, or cancel promotions, you must customize Siebel CRM to accept the following information and pass it to the PCM_OP_SUBSCRIPTION_SET_ BUNDLE opcode:

- Promotion name.
- Promotion description.
- Products and discounts bundled with the promotion.
- Promotion creation date.
- Promotion validity dates.
- Promotion status: active, inactive, or canceled.

In an Oracle AIA system, you pass this information from Siebel CRM to BRM through J2EE Connector Architecture (JCA) Resource Adapter, which exposes the BRM API through a JCA common client interface (CCI) as an Interaction. Data required for sending data to PCM_OP_SUBSCRIPTION_SET_BUNDLE is detailed in the Subscription Web service. For more information, see "Connecting J2EE-Compliant Applications to BRM" in *BRM JCA Resource Adapter*.

To implement the ability to display Siebel CRM promotions on invoices, add the following functionality to Siebel CRM by using the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode:

- Create **/purchased_bundle** objects. See "Adding a promotion to an account".
- Modify **/purchased_bundle** objects. See "Modifying an account's promotion".
- Inactivate **/purchased_bundle** objects. See "Inactivating an account's promotion".
- Cancel **/purchased_bundle** objects. See "Canceling an account's promotion".

Adding a promotion to an account

To add a promotion to a customer's account, pass in details about the promotion to PCM_OP_SUBSCRIPTION_SET_BUNDLE. You must also set the following fields in the opcode's input flist:

- In the PIN_FLD_BUNDLE_INFO array:
  - Set the PIN_FLD_POID field to a type-only POID for **/purchased_bundle**.
  - Set the PIN_FLD_STATUS field to **1** to set the promotion's status to **Active**.

    Note: If PIN_FLD_STATUS is not passed in, the promotion's status is set to active by default.

- In the PIN_FLD_OFFERINGS array, specify the products and discounts associated with the promotion. You must create a separate array for each product and discount in the promotion. In the PIN_FLD_OFFERINGS array:
  - Set the PIN_FLD_POID field to the POID of the **/purchased_product** or **/purchased_discount** object.
  - Set the PIN_FLD_BUNDLE_OBJ field to NULL.
  - Set the PIN_FLD_BUNDLE_INFO array to the rec_id of the PIN_FLD_BUNDLE_INFO array at the 0th level of the flist. This specifies to associate the newly created **/purchased_bundle** object with the specified product or discount during account creation.

Modifying an account's promotion

To modify an account's existing promotion, pass in the promotion details that changed to the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode:

- **To change a promotion's attributes**: In the PIN_FLD_BUNDLE_INFO array, set the PIN_FLD_POID field to the existing **/purchased_bundle** POID and then pass in only the fields that have changed.
- **To transfer a promotion from one account to another**: In the PIN_FLD_BUNDLE_INFO array, set the PIN_FLD_POID field to the existing **/purchased_bundle** POID and set the PIN_FLD_ACCOUNT_OBJ field to the new **/account** POID.
- **To add products and discounts to a promotion**: In the PIN_FLD_OFFERINGS array, set the PIN_FLD_POID field to the complete POID of the product or discount that is being added to the promotion and set the PIN_FLD_BUNDLE_OBJ field to the complete POID of the **/purchased_bundle** object.
- **To remove an existing product or discount from a promotion**: In the PIN_FLD_OFFERINGS array, set the PIN_FLD_POID field to the complete POID of the

product or discount that is being removed from the promotion and set the PIN_FLD_BUNDLE_OBJ field to NULL.

When a promotion is modified, the opcode:

- Changes the specified **/purchased_bundle** object.
- Changes the PIN_FLD_PLAN_OBJ field of the **/purchased_product** or **/purchased_discount** object, if a product or discount changed.
- Generates an **/event/billing/bundle/modify** object for auditing purposes, if a promotion's attributes changed.

Inactivating an account's promotion

When you inactivate an account's promotion, the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode sets the promotion's status to **Inactive**. It does not update the associated product or discount object's PIN_FLD_PLAN_OBJ field. Also, unlike the canceled status, a promotion's details can be modified after it has been inactivated.

To inactivate a promotion, pass in details about the promotion to PCM_OP_SUBSCRIPTION_SET_BUNDLE and set the PIN_FLD_STATUS field in the PIN_FLD_BUNDLE_INFO array to **2**.

Canceling an account's promotion

You can no longer make changes to an account's promotion after it has been canceled. When you cancel an account's promotion, the PCM_OP_SUBSCRIPTION_SET_BUNDLE opcode:

- Sets the promotion's validity end date to the current date.
- Sets the promotion's status to **cancelled**.

In addition, the opcode can optionally disassociate the products and discounts from the promotion by changing the PIN_FLD_PLAN_OBJ field of the **/purchased_product** object and the **/purchased_discount** object to NULL.

To cancel an account's promotion, call PCM_OP_SUBSCRIPTION_SET_BUNDLE and set the **PIN_FLD_STATUS** field in the **PIN_FLD_BUNDLE_INFO** array to **3**. To configure the opcode to also disassociate the products and discounts from the promotion, do the following:

- Set the PIN_FLD_FLAGS field to **1**. When set, the opcode searches for and disassociates the account's products and discounts from the promotion. This option decreases processing performance.
- In the PIN_FLD_OFFERINGS array, set the PIN_FLD_POID field to the complete POID of the product or discount that is being canceled and set the PIN_FLD_BUNDLE_OBJ field to NULL. When set, the opcode disassociates the products and discounts you specify from the promotion.

Important: To improve processing performance, pass in all products and discounts that are associated with the promotion you are canceling.

Using Invoice Templates That Display Promotion Names

To display promotion names and details, your invoices must use a template that includes a space holder for promotion details. The default **sample1.xsl** template is

preconfigured to display promotion names and details. You can use this XSL template or create your own template.

To view promotion details on invoices, do one of the following:

- Use the default **sample1.xsl** invoice template. If your system uses multiple invoice templates, you can switch to the XSL template by using the **pin_load_invoice_template** utility. See "Switching between XSLT and HTML Templates".
- Modify your custom XSL invoice template to display promotion name details, and then load the template into the database. See "Using XSLT Invoice Templates".
- Customize the **pin_invoice_template.html** template by using the PCM_OP_INV_POL_FORMAT_INVOICE_HTML policy opcode. See "Customizing the Format for HTML Invoices".

Setting Up Invoicing on Multiple Database Schemas

You can run invoicing in a multischema system in either of the following ways:

- Run invoicing on one schema at a time by using one instance of the invoicing utilities. See "Running Invoicing on Multiple Database Schemas One at a Time".
- Run invoicing on multiple schemas simultaneously by using multiple instances of the invoicing utilities. See "Running Invoicing on Multiple Database Schemas Simultaneously".

Running Invoicing on Multiple Database Schemas One at a Time

Running invoicing utilities on multiple database schemas one at a time requires that you edit the invoicing configuration file each time you run the invoicing utilities. Perform the following procedure before you run invoicing:

1. Open the invoicing configuration file (*BRM_home*/**apps/pin_inv/pin.conf**).
2. Change the value of the **login_name** entry to a database account in the schema against which you want to run invoicing.

   For example, to run invoicing using the account **root.0.0.0.2**, change the **login_name** entry as follows:

   ```
   - nap login_name root.0.0.0.2
   ```

3. Save and close the file.
4. Run the invoicing utilities.

Running Invoicing on Multiple Database Schemas Simultaneously

Running invoicing on multiple database schemas simultaneously requires that you create parallel instances of the invoicing configuration files, each of which is configured for a particular schema. Then, you run all instances of your invoicing utilities.

1. For each schema you want to run invoicing on, create a subdirectory under *BRM_home*/**apps/pin_inv**.

   For example, *BRM_home*/**apps/pin_inv/db1** for schema 1, *BRM_home*/**apps/pin_inv/db2** for schema 2, and so forth.
2. Copy the *BRM_home*/**apps/pin_inv/pin.conf** file into each new subdirectory.
3. In each invoicing subdirectory, do the following:

a. Open the **pin.conf** file.

b. Change the database number in the **login_name** entry to a database account that resides in the schema against which you want to run invoicing.

   For example, to run invoicing using the account **root.0.0.0.2**, change the **login_name** entry as follows:

   ```
   - nap login_name root.0.0.0.2
   ```

c. Save and close the file.

4. Run the invoicing utilities from the new subdirectories.

Using an /invoice Subclass

If you add a subclass to the **/invoice** object and want to use the subclass for invoicing, you must specify the subclass type. There are two ways you can do this:

- Specify the invoice object database number and type in the PIN_FLD_INVOICE_OBJ field in the **/payinfo** class. Then, using **testnap**, change the **invoice_obj_type** in the **payinfo_t** table to the subclass type.
- Edit the CM configuration file (*BRM_home***/sys/cm/pin.conf**) by doing the following:

  a. In the **Invoice_db** entry, add the subclass extension name to **/invoice**.

  > **Important:** This entry is read during account creation time. Changing it has no effect on existing accounts. If you want the **/invoice** subclass to apply to existing accounts, you must use the previous method instead.

  b. Change the following line:

  ```
  -fm_cust_pol invoice_db 0.0.0.1 /invoice 0
  ```

  To this:

  ```
  -fm_cust_pol invoice_db 0.0.0.1 /invoice/extension_name -1
  ```

  > **Note:** This entry is not in the CM **pin.conf** file by default unless you install the Invoice DM (**dm_invoice**). You can, however, add the entry yourself.

2

Corrective Invoicing

This chapter describes the support for corrective invoicing in Oracle Communications Billing and Revenue Management (BRM).

Before reading this document, read "About Corrective Billing" in *BRM Configuring and Running Billing*.

About Corrective Invoices

A corrective invoice is the invoice associated with a corrective bill. You generate a corrective invoice after you make corrections to a bill.

Corrective invoices can be the result of simple corrections or corrections to charges.

- Simple corrections to a bill consist of changes that do not affect the amount owed by the customer, such as changes to the invoice address or to the language in the customer profile. You can generate a corrective invoice to reflect the corrected information for a customer's bill, even when the charges have not changed.
- Corrections to the charges result from catalog corrections and accounts receivable (A/R) actions such as debits or credits, adjustments, dispute settlements and so on.

After a corrective invoice is generated, it is sent to the customer.

Types of Corrective Invoices

BRM supports the following types of corrective invoices:

- Replacement invoices, which show the regular (unchanged) portion of a regular invoice and all the corrections made to the invoice. Additionally, it supports regenerate invoices (also known as duplicate invoices), which are previously generated replacement invoices with no changes to the data on that invoice. See "Replacement Invoice in Detail Format" for an example of a replacement invoice.
- Invoice correction letters, which list only the corrections as a letter for the customer whose bill you corrected. See "Invoice Correction Letter in Summary Format" for an example of an invoice correction letter.

BRM can generate summary and detailed versions of replacement invoices and invoice correction letters.

Contents of Replacement Invoices and Invoice Correction Letters

Replacement invoices and invoice correction letters include the following:

- Customer information, such as a name and address.

- Previous bill information, such as the previous bill number, billing period, and previous billing date.
- Corrective bill information, such as the corrective bill number and the new payment due date.
- Bill totals.

A replacement invoice and an invoice correction letter differ in the following ways:

- The invoice correction letter contains only the corrected bill items and the corrected events.
- The replacement invoice includes all bill items and events from the previous invoice and any corrections to those bill items and events.

About Invoices and Billing Periods

You can issue multiple corrective invoices for a billing period. BRM does not carry over A/R actions that were included in a corrective invoice to the next regular invoice. For example, an adjustment of $10 allocated to the November bill period results in a corrective bill for November. BRM does not re-list the $10 adjustment details in the regular bill for December. BRM would list the adjustment details in the regular bill for December only if the corrective bill for November did not include the adjustment.

Processing Payments after Issuing a Corrective Invoice

After BRM issues a corrective invoice, it processes subsequent payments received against the corrective bills. It collects payments on the new due dates associated with the corrective invoice.

About Replacement Invoices for an Account Hierarchy

You can configure the replacement invoices for parent bills to include information from subordinate bill units by setting the **SubARItemsIncluded** business parameter. For information on **SubARItemsIncluded**, see the description for pricing and rating business parameter entries in *BRM System Administrator's Guide*.

Detailed Replacement Invoice for a Parent Bill

If you include information from subordinate bill units, the detailed replacement invoice for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or to any subordinate bill.
- Adjustment details of the parent and subordinate bills.
- For corrected bill items associated with a subordinate bill, the corrected fields such as previous amount and corrected amount.
- A list of all events for the parent bill and the subordinate bills.

If you do not include information from subordinate bill units, the detailed replacement invoice for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or any subordinate bill.
- All bill items for the parent bill only.
- Adjustment details for the parent bill only.

- A list of all events for the parent bill only.

Summary Replacement Invoice for a Parent Bill

If you include information from subordinate bill units, the summary replacement invoice for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or to any subordinate bill.
- Adjustment items.

If you do not include information from subordinate bill units, the summary replacement invoice for the parent bill contains:

- All bill items for the parent bill only.
- Adjustment items for the parent bill only.

Detailed Replacement Invoice for a Subordinate Bill

Whether you include or exclude items from the subordinate bill in the parent bill's invoice, the detailed replacement invoice for the subordinate bill contains the following:

- The adjustment details, if a subordinate bill had a correction.
- For the corrected bill items associated with a subordinate bill, the correction fields such as the previous amount and the corrected amount.
- Content identical to the original invoice, if a subordinate bill had no charge corrections.
- All the events for the subordinate bill.

Summary Replacement Invoice for a Subordinate Bill

Whether you include or exclude items from the subordinate bill in the parent bill's invoice, the summary replacement invoice for the subordinate bill contains the following:

- All bill items for the subordinate bill, whether or not the subordinate bill had a correction.
- The adjustment details, if a subordinate bill had a correction.
- For the corrected bill items associated with a subordinate bill, the correction fields such as the previous amount and corrected amount.
- Content identical to the original invoice, if a subordinate bill had no charge correction.

About Invoice Correction Letters for an Account Hierarchy

You can configure the invoice correction letters for parent bills to include information from subordinate bill units by setting the **SubARItemsIncluded** business parameter. For information on **SubARItemsIncluded**, see the description for pricing and rating business parameter entries in *BRM System Administrator's Guide*.

Detailed Invoice Correction Letter for a Parent Bill

If you include information from subordinate bill units, the detailed invoice correction letter for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or to any subordinate bill.
- For event-level adjustments only, the corrected events showing the original and corrected amounts.

If you do not include information from subordinate bill units, the detailed invoice correction letter for the parent bill contains the following:

- The bill total and the bill due amount or the balance on the parent bill updated for corrections made to any subordinate bill.
- Adjustment details for the parent bill only.

Summary Invoice Correction Letter for a Parent Bill

If you include information from subordinate bill units, the summary invoice correction letter for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or to any subordinate bill.
- Adjustment items.
- Only the corrected bill items associated with a subordinate bill that has a correction. For each correction, the invoice correction letter displays the previous amount and corrected amount.

If you do not include information from subordinate bill units, the summary invoice correction letter for the parent bill contains the following:

- The bill total and the bill due amount (or the balance) on the parent bill updated for corrections made to the parent bill or to any subordinate bill.
- Adjustment items for the parent bill only.
- No bill items, if no adjustment was made to the parent bill.

Detailed Invoice Correction Letter for Subordinate Accounts

If a subordinate bill does not have any correction, BRM does not generate an invoice correction letter.

Whether you include or exclude items from the subordinate bill in the parent bill's invoice, the detailed invoice correction letter for the subordinate bill contains only the corrected bill items. For each correction, the invoice correction letter displays the previous amount and corrected amount. All events that were adjusted are shown.

Summary Invoice Correction Letter for Subordinate Accounts

If a subordinate account does not have any correction, BRM will not generate an invoice correction letter.

For each subordinate bill with a correction, whether you include or exclude items from the subordinate bill in the parent bill's invoice, the summary invoice correction letter for the subordinate bill contains the following:

- Adjustment items.
- Only the corrected bill item associated with a subordinate bill that has a correction. Each such corrected bill item displays the correction fields such as the previous amount and corrected amount.

How BRM Displays Manual Adjustments

BRM displays the adjustment details and corrected bill items for the manual adjustments that you enter at the account, service, bill, item, and event level. For adjustments at the event level, BRM displays the corrected events.

About Generating Corrective Invoices

To generate corrective invoices, you include corrective bills when you run the **pin_inv_accts** utility. In addition, the **pin_inv_accts** utility automatically runs and generates corrective invoices when you run the **pin_bill_day** script. The **pin_inv_accts** utility can generate summary and detailed invoices for regular bills and summary and detailed corrective invoices for corrective bills.

When creating a corrective invoice, the **pin_inv_accts** utility does the following:

1. Validates the input parameters to ensure that a corrective invoice can be generated for the corrective bill. For example, it checks that there is a corrective bill.
2. Generates the corrective invoice with all the invoice data from the bill, with the account attributes and any additional data elements (for example new aggregations) required to be displayed on the customer invoice.

For a complete description of how invoices are generated in BRM, see "How Invoices Are Generated".

About the pin_inv_accts Utility Parameters

The **pin_inv_accts** utility is used to generate regular and corrective invoices. For a complete description of the parameters associated with the **pin_inv_accts** utility, see "pin_inv_accts".

To generate corrective invoices, run the **pin_inv_accts** utility, provide values for the parameters that are common to both regular and corrective invoices, and provide values for parameters that are specific to corrective invoices.

Use the following input parameters when you generate corrective invoices:

- **-corr_bills**. The **-corr_bills** parameter creates corrective invoices.
- **-corr_type** *type*. The **-corr_type** parameter indicates the type of corrective invoice you require:
  - **replacement** generates a replacement invoice.
  - **correction** generates an invoice correction letter.

  The **pin_inv_accts** utility uses the value input for **-corr_type** as the required type of corrective invoice for the corrective bill. This value overrides any previous value for the corrective invoice type.
- **-summary | -detail**. BRM generates a summary corrective invoice if **-summary** parameter is set. It generates a detailed invoice if the **-detail** parameter is set.

  For both regular and corrective invoices, use **-summary** or **-detail** to generate the respective summary or detailed versions of the invoice. If you do not specify either of these parameters, **pin_inv_accts** creates a detailed corrective invoice.

For example:

```
pin_inv_accts -corr_bills -corr_type replacement -summary
```

The **pin_inv_accts** utility calls the PCM_OP_INV_MAKE_INVOICE opcode to generate the invoice. For more information on the PCM_OP_INV_MAKE_INVOICE opcode, see "How Invoices Are Generated" and "PCM_OP_INV_MAKE_INVOICE" in *BRM Developer's Reference*.

About Corrective Invoice Templates

BRM uses Oracle Business Intelligence (BI) Publisher templates to format corrective invoices. If you plan to use BI Publisher to generate corrective invoices, ensure that you have set up your system appropriately. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

Note: BRM does not support versioning for corrective invoice templates. If you modify the template for replacement invoices or invoice correction letters, BRM uses the modified template.

Table 2–1 lists the default corrective invoice templates for corporate customers.

Table 2–1 Default Corrective Invoice Templates for Corporate Customers

Corrective Invoice Type	Default Template	Report File
Replacement Invoice	BRM_Corporate_Replacement_Invoice.rtf	BRM_Corporate_Replacement_Invoice_Report.xdo
Invoice Correction Letter	BRM_Corporate_Correction_Invoice.rtf	BRM_Corporate_Correction_Invoice_Report.xdo

Table 2–2 lists the default corrective invoice templates for non-corporate customers.

Table 2–2 Default Corrective Invoice Templates for Non-Corporate Customers

Corrective Invoice Type	Default Template	Report File
Replacement Invoice	BRM_Consumer_Replacement_Invoice.rtf	BRM_Consumer_Replacement_Invoice_Report.xdo
Invoice Correction Letter	BRM_Consumer_Correction_Invoice.rtf	BRM_Consumer_Correction_Invoice_Report.xdo

Configuring Corrective Invoice Templates Based on Business Profiles

You specify the corrective invoice templates in the **/associated_bus_profile** object for each bill unit. BRM determines the corrective invoice template type for each bill by using the following fields in the **/associated_bus_profile** object.

- PIN_FLD_TEMPLATE_NAME specifies the template name.
- PIN_FLD_REPORT_NAME specifies the report name.
- PIN_INV_TYPE specifies whether the invoice is for a regular bill or a corrective bill.

After you enable the BRM-BI Publisher invoice integration, BRM associates each bill with an invoice template. When you create a customer account, the PCM_OP_CUST_CREATE_BILLINFO opcode calls the PCM_OP_CUST_CREATE_ASSOCIATED_BUS_PROFILE opcode to create one **/associated_bus_profile** object for each bill unit.

For information on **/associated_bus_profile**, see *BRM Developer's Reference*.

Providing Custom Templates for Corrective Invoices

You can create custom templates in BI Publisher to suit your requirements. For information, see the Oracle Business Intelligence Publisher documentation.

To be able to generate a corrective invoice using a custom template for an account's corrective invoices, specify the custom template name in the business profile for the account in the **pin_business_profile.xml** file. If you use both replacement invoices and invoice correction letters for an account, you need to define both sets of templates for the business profile associated with that account.

- **Consumer Invoices**: Specify the custom corrective invoice templates for consumer invoices in place of the following default entries in the **pin_business_profile.xml** file:

```
<InvoiceType type="RepInvoice" />
<NameValue key="RepInvoiceReport_Name" value="BRM_Consumer_Repl_Invoice_
Report"/>
<NameValue key="RepInvoiceTemplate_Name" value="BRM_Consumer_Repl_Invoice"/>
<InvoiceType type="InvoiceCorrLetter" />
<NameValue key="InvCorrLetterReport_Name" value="BRM_Consumer_Invoice_
CorrLetter_Report"/>
<NameValue key="InvCorrLetterTemplate_Name"
value="BRM_Consumer_Invoice_CorrLetter"/>
```

- **Corporate Invoices**: Specify the custom corrective invoice templates for corporate invoices in place of the following default entries in the **pin_business_profile.xml** file:

```
<InvoiceType type="RepInvoice" />
<NameValue key="RepInvoiceReport_Name" value="BRM_Corporate_Repl_Invoice_
Report"/>
<NameValue key="RepInvoiceTemplate_Name" value="BRM_Corporate_Repl_Invoice"/>
<InvoiceType type="InvoiceCorrLetter" />
<NameValue key="InvCorrLetterReport_Name" value="BRM_Corporate_Invoice_
CorrLetter_Report"/>
<NameValue key="InvCorrLetterTemplate_Name" value="BRM_Corporate_Invoice_
CorrLetter"/>
```

For more information, see "Specifying the BI Publisher Report and Template".

About Corrective Invoices and Collections

Collections Manager processes bills by the POID value in the **/bill** object and not the bill number, which differs for the regular bill and its corrective bill. Collections Manager uses the POID value to keep track of the payments and the resulting effect on a bill (that is, whether the bill enters, stays in, or exits collections).

When a corrective bill has been created for a regular bill not in collections, Collections Manager checks the new bill balance against the threshold you defined for collection eligibility. If the bill balance after adjustments goes above that threshold, BRM automatically moves the corrected bill into collections.

When a prior bill is already in collections, BRM suspends actions on that prior invoice until the corrections are entered and processed. After the corrections are processed, BRM generates the corrective invoice and checks the new bill balance against the

threshold you defined for collection eligibility. If the new bill balance goes below that threshold, BRM automatically moves the corrected bill out of collections.

For more information on Collections Manager and its **pin_collections_process** utility, see the discussion on how Collections Manager processes bill units in *BRM Collections Manager*.

Corrective Invoices and General Ledger Posts

BRM posts the difference between the original and corrected amounts to the open general ledger (G/L) period only. It does not post such adjustment amounts to the prior G/L period to which the original amounts were posted.

For more information on general ledger, see *BRM Collecting General Ledger Data*.

Setting Up Corrective Invoicing in BRM

To set up the corrective invoicing process in BRM:

1. Ensure that all the preliminary configurations required for regular and corrective billing are completed. See *BRM Configuring and Running Billing*.
2. Ensure that BRM is set up according to your requirements:
   - To use the default templates for corrective invoices, verify that BRM is set up with the required templates to generate the required type of corrective invoice. See "Setting Up Your System to Generate Invoice Documents Using BI Publisher".
   - To use custom templates for corrective invoices, verify that BRM is set up with the required templates to generate the required type of corrective invoice. See "Providing Custom Templates for Corrective Invoices".
3. Specify the required type of corrective invoice, if necessary. See "Specifying the Type of Corrective Invoice".

Specifying the Type of Corrective Invoice

The **/event/billing/corrective_bill** object created by BRM contains the settings for the corrective invoice type (replacement invoice or invoice correction letter) and the format for the invoice (summary or detail). See *BRM Configuring and Running Billing* for more information.

You can override these settings when you run the **pin_inv_accts** utility. See "About the pin_inv_accts Utility Parameters" and "pin_inv_accts".

Providing Custom Templates for Corrective Invoices

The default BI Publisher templates for replacement invoices or invoice correction letters have been described in "About Corrective Invoice Templates". You can select an appropriate corrective invoice template for customer accounts from the default corrective invoice layout templates that BRM provides.

Alternatively, you can design a corrective invoice template to suit your business requirements and associate that template with specific accounts.

If you plan to use custom templates for corrective invoices, do the following:

1. Create the required corrective invoice template. See the Oracle Business Intelligence Publisher documentation for instructions on how to create and design layout templates.
2. Load the custom invoice template into BI Publisher. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".
3. Modify the **pin_business_profile.xml** file to associate the name of this custom invoice template with the default replacement invoice or invoice correction letter template. See "Providing Custom Templates for Corrective Invoices".

   For more information on **pin_business_profile.xml**, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".
4. Load the **pin_business_profile.xml** file into **/config/business_profile** objects in the BRM database by using the **load_pin_business_profile** utility. See "Managing Business Profiles" and "load_pin_business_profile" in *BRM Managing Customers*.
5. Update the **/associated_bus_profile** objects for the modified **/config/business_profile** objects by using the PCM_OP_CUST_SET_ASSOCIATED_BUS_PROFILE opcode. See "PCM_OP_CUST_SET_ASSOCIATED_BUS_PROFILE" in *BRM Developer's Reference*.
6. Complete the steps listed under "Generating Corrective Invoices". When you submit the corrective bill in Customer Center or by using **pin_inv_accts**, set the corrective invoice type to the required type.

For information on designing and generating invoices in BI Publisher, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

Generating Corrective Invoices

To generate corrective invoices:

1. Verify that the required corrective bills have been generated:
   a. Access Customer Center.
   b. Review the contents of the corrective bills.
2. The required templates should be available. Verify that the templates are successfully stored in the business profiles. See "Providing Custom Templates for Corrective Invoices".
3. Run **pin_inv_accts** with the required input parameters to generate the corrective invoice either automatically as part of daily billing or separately. See "About the pin_inv_accts Utility Parameters". For a description of the **pin_inv_accts** utility, see "pin_inv_accts".
4. Use **pin_inv_doc_gen** to generate the corrective invoice documents through BI Publisher. See "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".
5. (Optional) If you plan to use custom programs (such as DOC1) to generate and publish corrective invoice documents, run **pin_inv_export** with the required input parameters and export corrective invoices to a file in a format you can use with other programs. See **pin_inv_export** in *BRM Developer's Reference*.

Post-Processing Actions

After the corrective invoice is generated:

- View the Corrective Invoice. See "Viewing Corrective Invoices".
- Send the corrective invoices to your customer. See "Sending Invoices to Customers".

Viewing Corrective Invoices

BRM supports the BI Publisher client of the BRM-Business Intelligence Publisher Integration framework for displaying corrective invoices.

For more information, see the description for displaying invoices in "Displaying Invoices".

3

Designing and Generating Invoices in Oracle Business Intelligence Publisher 11*g*

This chapter describes how to design, generate, and customize Oracle Communications Billing and Revenue Management (BRM) invoice documents using Oracle Business Intelligence (BI) Publisher 11*g*.

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

- Basic database administration concepts. See your database documentation.
- BI Publisher 11*g* functions. See your BI Publisher documentation.

Note: For information on integrating BRM with Oracle BI Publisher 10*g*, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

About BRM Integration with BI Publisher for Invoicing

BRM comes with a pre-integrated invoicing framework. This framework uses BI Publisher as the publishing application, allowing users to create more stylized and detailed invoices in PDF format. BRM also includes sample RTF templates for individual customers and for corporate customers. In these templates, some of the core business functions are pre-built and can be customized. You can configure and extend these templates for your specific business needs.

With BI Publisher 11*g*, you use an SQL bursting query, which is the process of splitting data into blocks and generating documents for those blocks. Bursting increases throughput performance in BI Publisher. With increased throughput, you reduce the number of times you have to extract data to create invoices. For example, in a non-bursting environment, 50,000 invoices would require BI Publisher to connect to BRM 50,000 times, which can significantly reduce system performance. In a bursting environment, you can tune BI Publisher by setting a chunk size parameter. In the example of creating 50,000 invoices, BI Publisher only has to connect to BRM 5 times if you set the chunk size to 10,000.

BI Publisher allows you to choose from a variety of desktop tools, such as Microsoft Word and Adobe Acrobat, to create document templates. While BI Publisher supports data sources such as database, Web services, and files, the BRM-BI Publisher invoicing integration only uses SQL queries directly on the database as the data source for better performance. By default, the BRM-BI Publisher invoicing integration supports PDF as an output format and delivery options such as email, FTP, and SFTP.

The pre-integrated invoicing framework eliminates the need for any proprietary invoice design tools, resulting in lowered costs. BI Publisher leverages familiar desktop software, so using the software requires minimal learning.

To use this feature, you must install BI Publisher and BI Publisher Desktop.

Note: BRM-BI Publisher 11*g* invoicing integration is certified only on WebLogic Server, which is bundled with the BI Publisher product. The BRM-BI Publisher invoicing integration is certified on BI Publisher 11.1.1.7 and 11.1.1.9.

Overview of BRM and BI Publisher Invoice Generation

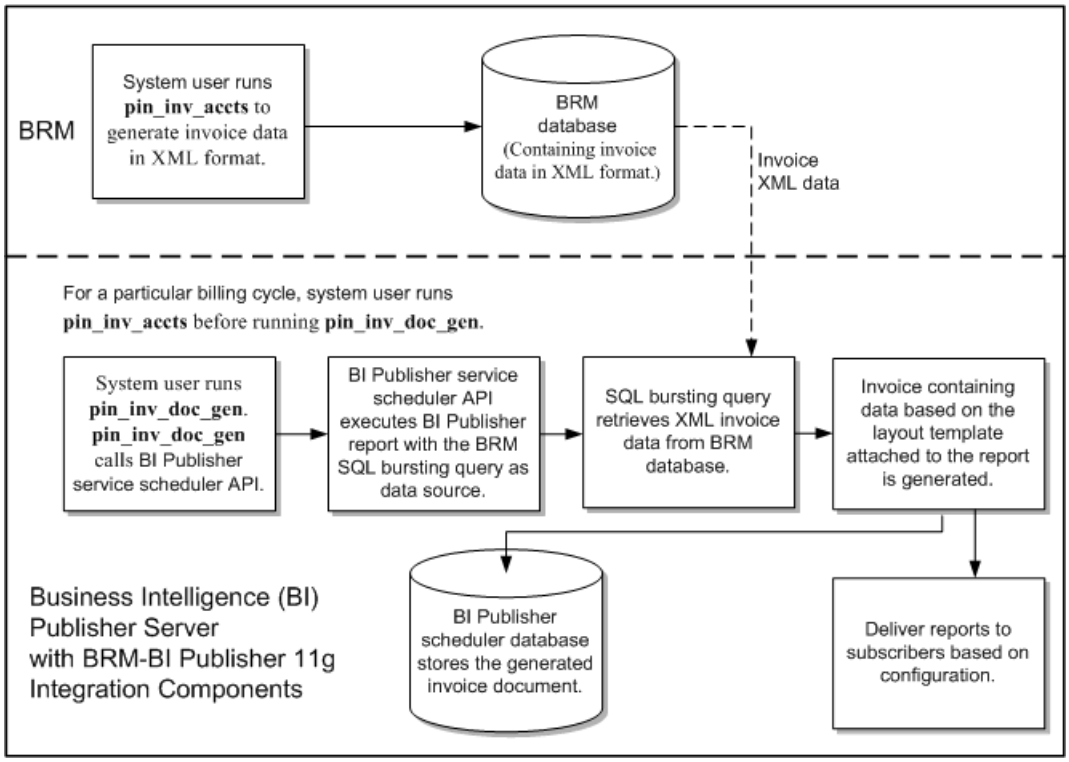
BI Publisher is an enterprise reporting solution to author, manage, and deliver all types of formatted documents. You can customize the layout of the generated invoice document using the template builder capabilities of BI Publisher. A typical invoice document generated using BRM-BI Publisher integration is in "Understanding Invoice Layout".

When you use the BRM-BI Publisher integration:

- BRM generates the invoicing data in XML format and then passes the data to BI Publisher.
- BI Publisher formats the invoice, delivers, and stores it in the BI Publisher database.

Figure 3–1 shows the BRM and BI Publisher invoice generation process:

Figure 3–1 BRM and BI Publisher Invoice Generation Process



About the Invoicing Process

The BRM-BI Publisher integration generates invoice documents as follows:

> **Note:** The BRM-BI Publisher integration must be enabled. See "Enabling the BRM-BI Publisher Integration".

1. **BRM associates bill units with a BI Publisher invoice and report**. When accounts are created, BRM associates each bill unit with a BI Publisher invoice report and layout template. See "About Associating Bill Units with a BI Publisher Invoice and Report".
2. **Integrating BRM and BI Publisher for generating invoice documents.** To generate invoice documents using BRM-BI Publisher integration framework, you must enable the integration between BRM and BI Publisher. See "Enabling the BRM-BI Publisher Integration".
3. **BRM generates a bill.** BRM creates a bill for each account bill unit when it runs the **pin_bill_accts** utility as part of the daily billing script. BRM needs a bill before generating an invoice. See "Running Billing Utilities" in *BRM Configuring and Running Billing*.
4. **BRM generates the invoice and stores it in the BRM database.** When the **pin_inv_accts** utility is executed, it stores the invoice data in an **/invoice** object in the BRM database. See "Generating Invoices".

> **Note:** To generate invoice documents in BI Publisher, you must store the invoice data in XML format. See "About Formats for Storing Invoices".

5. **The pin_inv_doc_gen utility**:
   - **Runs BI Publisher reports**. This utility, based on the input parameters, starts and runs appropriate BI Publisher reports for invoice documents. It runs a BI Publisher invoicing report, with the SQL bursting data query, through a scheduled job. See "Generating BI Publisher Invoice Documents in BI Publisher 11g".
   - **Calls the SQL bursting data query to pull the invoice data from the BRM database**. The SQL bursting data query pulls the invoice data in XML format from the BRM database and returns the XML data necessary to generate invoice documents by the **pin_inv_doc_gen** utility.
   - **Generates the invoice in the preferred format and sends it using the configured information**. The delivery information is stored in the **/payinfo/invoice** object of the **account/billinfo** object.
   - **Stores the invoice document in the BI Publisher database.** The utility stores the generated invoice documents in the BI Publisher Scheduler database. See "Storing the Invoice Document".

About Associating Bill Units with a BI Publisher Invoice and Report

When the BRM-BI Publisher integration is enabled, BRM automatically associates bill units with a BI Publisher report name and invoice template name during the account creation process. When an account is created, BRM performs the following for each bill unit (**/billinfo** object) in the account:

- Determines the BI Publisher invoice report and template that the bill unit qualifies for by reading the **/config/business_profile** object. This object defines your invoice types, the criteria a bill unit must meet for the invoice type, and the BI Publisher invoice report and template names associated with the invoice type. For example, a **/config/business_profile** might define the following in Table 3–1 for a regular bill:

Table 3–1 Business Profile Example

Invoice Type	Criteria	BI Publisher invoice Report and Template Names
Monthly billing	The **/billinfo** object's PIN_FLD_WHEN field is set to **1**.	**monthly_invoice_report** and **monthly_invoice**
Quarterly billing	The **/billinfo** object's PIN_FLD_WHEN field is set to **3**.	**quarter_invoice_report** and **quarter_invoice**

- Creates an **/associated_bus_profile** object for the bill unit. This object stores the following information associated with invoicing for the bill unit as an element in a template array called PIN_FLD_TEMPLATE_ARRAY.
  - PIN_FLD_TEMPLATE_NAME. The Template name configured in the pair key Template_Name of the corresponding invoicing **/config/business_profile** object.
  - PIN_FLD_REPORT_NAME. The Report name configured in the pair key Report_Name of the corresponding invoicing **/config/business_profile** object.
  - PIN_INV_TYPE. The type of invoice stored as PIN_INV_TYPE_REGULAR or PIN_INV_TYPE_CORRECTIVE.
- Associates the bill unit with its **/associated_bus_profile** object by populating the **/billinfo** object's PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.

BRM creates an **/associated_bus_profile** object for each bill unit in an account by calling the PCM_OP_CUST_CREATE_ASSOCIATED_BUS_PROFILE opcode. This opcode is called internally by the PCM_OP_CUST_CREATE_BILLINFO opcode during the account creation process.

Whenever invoice business profiles are modified in the **/config/business_profile** object, use the PCM_OP_CUST_SET_ASSOCIATED_BUS_PROFILE opcode to update all related **/associated_bus_profile** objects.

About BRM-Business Intelligence Publisher Invoicing Integration Package Components

The BRM-BI Publisher invoicing integration package contains:

- The SQL bursting query.
- BI Publisher reports for generating invoice documents for consumer and corporate accounts. See "About BI Publisher Reports for Invoice Document Generation".
- Sample layout templates in rich text format (RTF) for consumer and corporate accounts. See "About Invoice Layout Templates for Invoice Document Generation".

Designing Invoices

You can use the following capabilities of BI Publisher to design invoice documents:

- Customizing invoice format: You can format the sample invoice layout templates or create new invoice templates. See "Customizing Invoice Layout Templates".
- Enriching invoice data: You can enrich the data that is displayed in the invoice by getting data from various sources. See "Enriching Invoice Data".

About Invoice Layout Templates for Invoice Document Generation

The BRM-BI Publisher invoicing integration package contains six layout templates in RTF for the consumer and corporate accounts which can be customized.

If the BRM-BI Publisher integration framework is enabled, when you create an account, the bill units (**/billinfo** objects) of the account are associated with an **/associated_bus_profile** object. The **/associated_bus_profile** object contains the report and template names that are used for generating invoice documents for this account on the BI Publisher server. See "Specifying BI Publisher Invoice Report and Template Names in BRM".

Default Templates for Regular Invoices

BRM provides the following default templates for regular invoices:

- BRM_Corporate_Invoice.rtf
- BRM_Consumer_Invoice.rtf

Default Templates for Replacement Invoices

BRM provides the following default **Replacement Invoice** templates:

- BRM_Corporate_Replacement_Invoice.rtf
- BRM_Consumer_Replacement_Invoice.rtf

When you use the default template for a replacement invoice, the resulting document contains all the line items and information from the previous bill or invoice. In addition, it lists the previous bill number, the previous bill date, the previous bill totals and the corrections totals. The item summary section lists the previous totals, the correction totals and the current totals for each item. The events details section lists the previous total, correction amount and current total for each event.

Default Templates for Invoice Correction Letters

BRM provides the following default **Invoice Correction Letter** templates:

- BRM_Corporate_Correction_Invoice.rtf
- BRM_Consumer_Correction_Invoice.rtf

The invoice correction letter is in a letter format. When you use the default template for an invoice correction letter, the resulting document contains a brief explanation of the correction, a bill summary section and the details of only the corrections made to the previous bill or invoice. The invoice correction letter displays the previous bill number, the previous bill date, the previous bill total, the total correction amount and the current total.

Report File for Default Invoice Templates

The report file that BI Publisher associates with each of the previously listed default templates for invoices is:

- BRM_Invoice_Bursting_Report.xdo

About BI Publisher Reports for Invoice Document Generation

The BRM-BI Publisher invoicing integration package contains two reports for consumer and corporate accounts. Details of these reports are:

- The data source of the sample BI Publisher reports is the SQL bursting query.
- Each report has a layout template in RTF associated with it that decides the look and feel of the invoice document.
- The output formats supported for the invoice document are PDF and HTML. The default output format specified in the reports is PDF.

Note: For the invoice documents to support data from various data sources, you need to configure additional data sources in the sample reports and customize the sample layout template.

Setting Up Your System to Generate Invoice Documents Using BI Publisher

To use the BRM-BI Publisher integration framework to generate invoice documents:

- Install BI Publisher. To install BI Publisher, follow the instructions in the BI Publisher documentation.
- In BRM, specify the BI Publisher invoice report and layout templates names. See "Specifying BI Publisher Invoice Report and Template Names in BRM".
- In BRM, specify the events that you want included in your invoices by editing the **events.file** file and then loading it into the BRM database with the **pin_load_invoice_events** utility. See "Including Payment, A/R, and Taxation Details in Invoices".
- Install the BRM-BI Publisher invoicing integration package on the BI Publisher server. See "Installing BRM-BI Publisher Invoicing Integration Package".
- Configure the **pin_inv_doc_gen** utility. See "Configuring the pin_inv_doc_gen Utility".
- Configure data source and data model.
- Configure for multischema. Store and modify copies of the report in each schema.

Specifying BI Publisher Invoice Report and Template Names in BRM

When the BRM-BI Publisher integration is enabled, BRM automatically performs the following during the bill unit (**/billinfo** object) creation process:

- Reads the invoicing configuration business profile (**/config/business_profile** object) to determine which BI Publisher invoice report and layout template the bill unit should be associated with.
- Creates an **/associated_bus_profile** object for the bill unit. This object specifies the names of the BI Publisher invoice report and layout template to use.
- Links the bill unit to the **/associated_bus_profile** object it created.

To create an invoicing configuration business profile:

1. Enable the BRM-BI Publisher integration. See "Enabling the BRM-BI Publisher Integration".

2. Specify the requirements for a bill unit to be associated with an invoicing configuration business profile by creating a validation template. See "Creating Bill Unit Validation Templates for Invoices".
3. Specify the validation template, invoice report, and layout template to be associated with the bill unit. See "Specifying the BI Publisher Report and Template".
4. Load the business profile information into the BRM database by using the **load_pin_business_profile** utility. See "Loading Invoicing Business Profiles into the Database".
5. If your system includes accounts that were created before you integrated BRM invoicing with BI Publisher, associate your existing **/billinfo** objects with **/associated_bus_profile** objects. See "Associating Pre-Existing Bill Units with Business Profiles".

Enabling the BRM-BI Publisher Integration

By default, BRM-BI Integration is disabled in BRM. You can enable this feature by modifying a field in the **invoicing** instance of the **/config/business_params** object.

You modify the **/config/business_params** object by using the **pin_bus_params** utility. For information on this utility, see "pin_bus_params" in *BRM Developer's Guide*.

To enable the BRM-BI Publisher integration for invoices:

1. Go to the *BRM_Home***/sys/data/config** directory, where *BRM_Home* is the directory in which you installed BRM components.
2. Run the following command, which creates an editable XML file from the **invoicing** instance of the **/config/business_params** object:

   ```
   pin_bus_params -r BusParamsInvoicing bus_params_Invoicing.xml
   ```

   This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. To place this file in a different directory, specify the path as part of the file name.
3. Open the **bus_params_Invoicing.xml.out** file.
4. Search for the following line:

   ```
   <EnableInvoicingIntegration>disabled</EnableInvoicingIntegration>
   ```

5. Change **disabled** to **enabled**.
6. Save the file as **bus_params_Invoicing.xml**.
7. Go to the *BRM_Home***/sys/data/config** directory, which includes support files used by the **pin_bus_params** utility.
8. Run the following command, which loads this change into the appropriate **/config/business_params** object:

   ```
   pin_bus_params PathToWorkingDirectory/bus_params_Invoicing.xml
   ```

   where *PathToWorkingDirectory* is the directory in which **bus_params_Invoicing.xml** resides.

Caution: BRM uses the XML in this file to overwrite the existing **invoicing** instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM invoicing configuration.

Note: To run this command from a different directory, see "pin_bus_ params" in *BRM Developer's Guide*.

9. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

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

10. Stop and restart the Connection Manager (CM). For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

11. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

Creating Bill Unit Validation Templates for Invoices

You specify the criteria a bill unit must meet to be associated with an invoicing configuration business profile by creating a bill unit validation template (**/config/template/billinfo**). For more information about validation templates, see "About Validation Templates" in *BRM Managing Customers*.

To create a bill unit validation template for invoices, edit the *BRM_ Home*/**sys/data/config/pin_business_profile.xml** file. The file specifies the following:

- The valid business profiles for each invoice type
- The criteria a bill unit must meet to qualify for each business profile
- The templateID name.

Note: Each type of invoice can have multiple business profiles, but they must all point to the same TemplateID name.

The default **pin_business_profile.xml** file includes entries for the consumer and corporate invoice documents. You can edit these entries or add entries for any other type of invoice document you want to generate.

For each type of invoice document you want to generate, edit the following entries:

- Set the **TemplateId name** entry to **InvoiceIntegration** and the **type** entry to **/billinfo**, as shown below:

  ```
  <TemplateId name="InvoiceIntegration"  type="/billinfo"/>
  ```

- Specify the criteria a bill unit must meet to be associated with an invoicing business profile in the **Iscript** section. Enter your conditions in the **if** and **else if** blocks and the name of the business profile in PIN_FLD_NAME.

> **Important:** The order in which criteria is written in the **if** and **else if** blocks defines the order in which a bill unit is evaluated against the criteria.

If a particular condition is met in the **if** and **else if** blocks, the business profile name associated with the condition is set with the **OUT** label as one of the Iscript return values.

For example:

```
<Iscript>

Long parentFlags = flistGetLong(IN,PIN_FLD_PARENT_FLAGS);

 if(parentFlags == 0)
 {
   flistSetEnum(OUT, PIN_FLD_RESULT, 1);
   flistSetStr(OUT, PIN_FLD_NAME, "ConsumerInvoice");
 }
 else if(parentFlags > 0)
 {
   flistSetEnum(OUT, PIN_FLD_RESULT, 1);
   flistSetStr(OUT, PIN_FLD_NAME, "CorporateInvoice");
 }
</Iscript>
```

Specifying the BI Publisher Report and Template

You specify the BI Publisher invoice reports and layout template names by editing the business profile configuration file (**pin_business_profile.xml**). The default XML file contains entries for generating a consumer invoice document. You can modify these entries and add entries for any other type of invoice document that you want to generate. For example, you can add entries to generate an invoice document for Internet customers or wireless telephony customers.

To specify the BI Publisher invoice report and layout template to use for generating an invoice document, edit the following entries in the *BRM_Home***/sys/data/config/pin_business_profile.xml** file. Add a set of entries for each type of invoice document you want to generate:

- Specify the name of the business profile in the **BusinessProfile name** entry. The name must match the PIN_FLD_NAME entry from the Iscript element.

  > **Important:** The **type** attribute entry for the BusinessProfile tags must be set to **Invoice**.

  For example:

  ```
  <BusinessProfile name="ConsumerInvoice" type="Invoice">
  ```

- Make sure **TemplateId name** is set to **InvoiceIntegration** and the **type** is set to **/billinfo**. All invoice business profiles must use these values.

  ```
  <TemplateId name="InvoiceIntegration" type="/billinfo"/>
  ```

- Specify the name of the BI Publisher XDO report to use for generating invoice documents in the **Report_Name** value entry. For example:

```
NameValue key="Report_Name" value="Bursting Invoice Report"
```

- Specify the name of the BI Publisher XDO report to use and the name of the layout template to use for each type of invoice, the regular invoice, the **Replacement Invoice** and the **Invoice Correction Letter**.

The following is a sample of the BusinessProfile tag entries for the default Corporate Invoice type in the **pin_business_profile.xml** file:

```
<BusinessProfile name="CorporateInvoice" type="Invoice">
  <Desc> Description of the business profile </Desc>
  <!-- List templates -->
  <TemplateId name="InvoiceIntegration" type="/billinfo" />
  <!-- List key values -->
  <NameValue key="Report_Name" value="Bursting Invoice Report"/>
  <NameValue key="Template_Name" value=" BRM_Corporate_Invoice"/>
  <NameValue key="Replacement_Report_Name" value="Bursting Invoice Report"/>
  <NameValue key="Replacement_Template_Name" value=" BRM_Corporate_Replacement_
Invoice"/>
  <NameValue key="Correction_Report_Name" value="Bursting Invoice Report"/>
  <NameValue key="Correction_Template_Name" value=" BRM__Corporate_Correction_
Invoice"/>
</BusinessProfile>
```

Loading Invoicing Business Profiles into the Database

After editing the **pin_business_profile.xml** file, use the **load_pin_business_profile** utility to load the contents of the file into **/config/business_profile** objects in the BRM database. For more information, see "Managing Business Profiles" in *BRM Managing Customers*.

Associating Pre-Existing Bill Units with Business Profiles

All **/billinfo** objects that were created prior to your BRM-BI Publisher integration will not be linked with an **/associated_business_profile** object, which prevents you from creating BI Publisher invoices for those **/billinfo** objects. For example, this occurs if you upgraded to BRM 7.5 from a prior release.

To generate BI Publisher invoice documents for **/billinfo** objects created prior to the BRM-BI Publisher integration, you must run the **pin_upd_assoc_bus_profile** utility.

The **pin_upd_assoc_bus_profile** utility is a standalone multithreaded application (MTA) that performs the following operations:

- Searches for **/billinfo** objects in the BRM database that have an empty PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.
- Creates an **/associated_bus_profile** object for each **/billinfo** object with an empty field.
- Links the **/billinfo** object with its **/associated_bus_profile** object by populating the **/billinfo** object's PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.

To associate pre-existing bill units with business profiles:

1. Make sure that the BRM-BI Publisher integration is enabled. See "Enabling the BRM-BI Publisher Integration".

> **Note:** The utility fails if you attempt to run it when the BRM-BI Publisher integration is disabled.

2. (Optional) If you want to associate only a subset of your pre-existing bill units with business profiles, create a text file that specifies the **/billinfo** objects to update. The file must use the following format:

```
0 PIN_FLD_RESULTS     ARRAY [0] allocated 20, used 1
1    PIN_FLD_POID      POID [0] 0.0.0.1 /billinfo 37395 1
0 PIN_FLD_RESULTS     ARRAY [1] allocated 20, used 1
1    PIN_FLD_POID      POID [0] 0.0.0.1 /billinfo 37488 3
```

3. Go to the *BRM_Home*/**apps/pin_billd** directory.

> **Note:** **pin_upd_assoc_bus_profile** requires a configuration file in the directory from which you run the utility. The configuration file requires the standard CM connection and MTA entries. See "Configuring Your Multithreaded Application" in *BRM Developer's Guide*.

4. Enter the following command:

```
pin_upd_assoc_bus_profile [-file filename]
```

   where *filename* specifies the name and location of the file that lists the **/billinfo** objects to update.

If you run the utility without any parameters, the utility searches all **/billinfo** objects in the BRM database. If you run the utility with the **-file** parameter, the utility searches only those **/billinfo** objects specified in the file.

About the /associated_bus_profile Object

If you are using BRM-BI Publisher integration framework to generate invoice documents, at the time of customer account creation, the **/associated_bus_profile** object is created. See "Enabling the BRM-BI Publisher Integration". The **/associated_bus_profile** object stores the invoicing business profile information for a **/billinfo** object. The **/associated_bus_profile** object contains the layout template name in the PIN_FLD_TEMPLATE _NAME field and the report name in the PIN_FLD_REPORT_NAME field.

Creating /associated_bus_profile Objects

If the BRM-BI Publisher invoicing integration is enabled, during customer account creation, internally the PCM_OP_CUST_CREATE_BILLINFO opcode calls the PCM_OP_CUST_CREATE_ASSOCIATED_BUS_PROFILE opcode to create one **/associated_bus_profile** object for each bill unit in the account.

Viewing Invoices Individually on the BI Publisher Console

In the BRM_Invoices reports directory (*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices/0.0.0***n*), the **ViewInvoiceReport** report is generated to view individually each invoice on the BI Publisher console.

Configure **ViewInvoiceReport** to point to the data source by editing the data model, configuring the data source, saving changes, and restarting BI Publisher. Enter the invoice POID for the input parameter and click **Submit** to see the report.

View the invoice on the console, By choosing the applicable template, such as Consumer Invoice, Corporate Invoice, Consumer Correction Invoice, Corporate Correction Invoice, Consumer Replacement Invoice, or Corporate Replacement Invoice.

Enabling the Display of Customer Details on the Web

By default, displaying contact details, account and bill numbers when using the Web is disabled in BI Publisher.

To enable the display of customer details on the Web:

1. Go to the *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices/schema_number/schema_number.xdm** directory.
2. Open the **_datamodel.xdm** file in a text editor.
3. Search for the following entry:

   ```
   <property name="include_rowsettag" value="false"/>
   ```

4. Change **false** to **true**.
5. Save and close the file.

Creating /associated_bus_profile Objects for Accounts in a Branded Environment

To create **/config/business_profile** objects for accounts in a branded environment:

1. In *BRM_Home*/**sys/data/config** directory, create a new directory for the brand.

   For example, **BrandA**.
2. Copy **pin.conf**, **business_configuration.xsd**, and **pin_business_profile.xml** files from *BRM_Home*/**sys/data/config** to *BRM_Home*/**sys/data/config/BrandA**.
3. Open **pin.conf** and add the following entries:

   ```
   nap login_name brandloginname
   nap login_pw brandpassword
   ```

   where *brandloginname* is the login name for the brand and *brandpassword* is the password for the brand.
4. Save and close the file.
5. Open **pin_business_profile.xml** and replace the default values with the new values listed in Table 3–2:

Table 3–2 Default Values in pin_business_profile.xml File

Entry	Default Value	New Value
BusinessProfile name	ConsumerInvoice	ConsumerInvoice_BrandA
TemplateId name	InvoiceIntegration	InvoiceIntegration_BrandA
NameValue value	BRM_Bursting_Invoice_Report	BRM_Bursting_Invoice_Report_BrandA
NameValue value	BRM_Consumer_Invoice	BRM_Consumer_Invoice_BrandA
BusinessProfile name	CorporateInvoice	CorporateInvoice_BrandA
TemplateId name	InvoiceIntegration	InvoiceIntegration_BrandA

Table 3–2 (Cont.) Default Values in pin_business_profile.xml File

Entry	Default Value	New Value
NameValue value	BRM_Bursting_Invoice_Report	BRM_Bursting_Invoice_Report_BrandA
NameValue value	BRM_Corporate_Invoice	BRM_Corporate_Invoice_BrandA
Template name	InvoiceIntegration	InvoiceIntegration_BrandA
flistSetStr PIN_FLD_NAME	ConsumerInvoice	ConsumerInvoice_BrandA
flistSetStr PIN_FLD_NAME	CorporateInvoice	CorporateInvoice_BrandA

6. Save and close the file.
7. Go to the *BRM_Home*/**sys/data/config/BrandA** directory and enter the following command:

   ```
   load_pin_business_profile pin_business_profile.xml
   ```

8. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

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

Creating Reports for Accounts in a Branded Environment in BI Publisher

1. In a Web browser, enter the following URL:

   http://*BI_Publisher_host*:*port***/xmlpserver/**

   where:

   - *BI_Publisher_host* is the host name on which the BI Publisher server is installed.
   - *port* is the console port. The default port is **9704**.

2. Log in to BI Publisher.
3. Create a new RTF template to associate it with the layout template specific for the accounts in a brand. See the discussion of creating an RTF template using the Template Builder for Word in the BI Publisher documentation.

   Note: The layout template name must be same as the template name specified in the updated **pin_business_profile.xml** file. For example, if you specify the layout template as **BRM_Consumer_Invoice_BrandA**, you must name the RTF template file as **BRM_Consumer_Invoice_BrandA.rtf**.

4. In **Shared Folders**, click **BRM_Invoices**.
5. Click **Create a new report** link.
6. Enter the report name as **BRM_Bursting_Invoice_Report_BrandA**.

   Note: The report name must be same as the report name specified in the updated **pin_business_profile.xml** file.

7. For the **BRM_Bursting_Invoice_Report_BrandA** report, click **Edit**. To specify report properties, see the discussion of creating the report entry and specify general properties in the BI Publisher documentation.

   Note:

   - The configuration of the **BRM_Bursting_Invoice_Report_BrandA** report must be same as the sample **BRM_Bursting_Invoice_Report** report in the BRM-BI Publisher invoicing integration package. For example, the **BRM_Bursting_Invoice_Report_BrandA report** must have the same WSDL URL as given in the **BRM_Bursting_Invoice_Report** report.
   - The layout template name must be **BRM_Consumer_Invoice_BrandA**.

8. Click **Save**.

Installing BRM-BI Publisher Invoicing Integration Package

This section describes how to install the BRM-BI Publisher invoicing integration package. This package is set up on the BI Publisher server.

To install the BRM-BI Publisher invoicing integration package:

- Ensure that the pre-installation requirements are met. See "Pre-Installation Requirements".
- Manually remove previously installed versions of the BRM-BI Publisher 11*g* invoicing integration layout template files. See "Removing Older BRM-BI Publisher 11g Invoicing Integration Layout Template Files".
- Run the BRM-BI Publisher invoicing integration package. See "Enabling the BRM-BI Publisher Invoicing Integration Package Application".

Important: Install the BRM-BI Publisher invoicing integration package on the system on which BRM Reports is installed. If the BRM-BI Publisher invoicing integration package and BRM Reports are not installed on the same system, you cannot view an invoice in BI Publisher 11*g*.

Pre-Installation Requirements

The following must be completed before you run the BRM-BI Publisher invoicing integration package application:

- BI Publisher 11*g* is installed.
- BI Publisher home environment variable has been successfully set.
- BRM 7.5 Patch Set 4 is installed. The patch set contains the **pin_inv_doc_gen** utility updates that are required for BI Publisher 11*g* integration.

For more information on these requirements, see *BRM Reports*.

Removing Older BRM-BI Publisher 11*g* Invoicing Integration Layout Template Files

When you install the BRM-BI Publisher invoicing integration package, the older versions of BRM-BI Publisher 11*g* invoicing integration layout template files are not automatically overwritten. Before installing the BRM-BI Publisher invoicing integration package, you must manually remove all previous versions of BRM-BI Publisher 11*g* invoicing integration layout template files.

To remove older BRM-BI Publisher 11*g* invoicing integration layout template files:

1. Go to *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices/***SchemaNumber*/**BRM_Bursting_Invoice_Report.xdo/**.

   where *SchemaNumber* is the directory for the BRM schema number to process BRM invoices; for example, 0.0.0.1.

2. Manually remove the following layout template files:
   - BRM_Consumer_Correction_Invoice.rtf
   - BRM_Consumer_Invoice.rtf
   - BRM_Consumer_Replacement_Invoice.rtf
   - BRM_Corporate_Correction_Invoice.rtf
   - BRM_Corporate_Invoice.rtf
   - BRM_Corporate_Replacement_Invoice.rtf
3. Go to *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices/***SchemaNumber*/**ViewInvoiceReport.xdo/**.
4. Manually remove the following layout template files:
   - BRM_Consumer_Correction_Invoice_en_US.rtf
   - BRM_Consumer_Invoice_en_US.rtf
   - BRM_Consumer_Replacement_Invoice_en_US.rtf
   - BRM_Corporate_Correction_Invoice_en_US.rtf
   - BRM_Corporate_Invoice_en_US.rtf
   - BRM_Corporate_Replacement_Invoice_en_US.rtf

Enabling the BRM-BI Publisher Invoicing Integration Package Application

To enable the BRM-BI Publisher invoicing integration package application:

1. On the system on which BRM Reports is installed, download the BRM-BI Publisher invoicing integration package **7.5PS4_BRM_BIP_Invoicing_Integration**_*platform*_**32_opt.bin** file to a temporary directory (*temp_dir*).

   Where *platform* is the platform on which BI Publisher is installed. For example, linux.

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.
>
> If you fail to do so, "suitable JVM not found" and other error messages appear.

For Bash shell:

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

For C shell:

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

3. Go to the *temp_dir* and enter the following command.

```
7.5PS4_BRM_BIP_Invoicing_Integration_platform_32_opt.bin -console
```

> **Note:** The search and verify step of the installation is optional. If the installation hangs, or appears to be taking too long during the search and verify step, you may interrupt the installer without impacting your installation.

4. If you are using a custom BI Publisher server setup, do the following:
   a. Copy the *BIP_Home*/**user_projects/domains/bifoundation_domain/servers/AdminServer/tmp/***WebLogic_user*/**bipublisher_11.1.1/6uc731/lib/BIPExtension.jar** file to your domain **lib** directory.
   b. Stop and restart the Oracle WebLogic Server, which adds the **BIPExtension.jar** file to the Oracle WebLogic server classpath and enables the BI Publisher extension library.
5. If you are using custom paths, copy the BRM-BI Publisher template files from *BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports** to your custom directories.

Installed Files

The BRM-BI Publisher invoicing integration program copies the following files listed in Table 3–3 to your computer during installation:

Table 3–3 BI Publisher-Related Files Placed on Your Computer

File	Install Path	Description
docgen.sh	*BRM_Home*/**apps/pin_inv_doc_gen**	Batch script for setting environment variables and launching the **pin_inv_doc_gen** utility.
BRM_Consumer_Correction_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for consumer corrective invoice letter document.
BRM_Consumer_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for consumer invoice document.
BRM_Consumer_Replacement_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for consumer replacement invoice document.
BRM_Corporate_Correction_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for corporate corrective invoice letter document.
BRM_Corporate_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for corporate invoice.
BRM_Corporate_Replacement_Invoice.rtf	*BIP_Home*/**user_projects/domains/bifoundation_domain/config/bipublisher/repository/Reports/BRM_Invoices**/*SchemaNumber*	RTF file associated with layout template for corporate replacement invoice document.
Create_Xmlp_Invoice_Job.sql	*BRM_Home*/**apps/pin_inv_doc_gen**	Script for creating **XMLP_INVOICE_JOB** table in BI Publisher Scheduler database.
invoice_bursting.plb	*BRM_Home*/**apps/pin_inv_doc_gen**	Invoice bursting stored procedure.
Infranet.properties.sample	*BRM_Home*/**apps/pin_inv_doc_gen**	**Infranet.properties.sample** file for **pin_inv_doc_gen.jar**. Contains the configuration entries for the **pin_inv_doc_gen** utility. **Important:** Before running the **pin_inv_doc_gen** utility, save the **Infranet.properties.sample** file as **Infranet.properties**.

Table 3–3 (Cont.) BI Publisher-Related Files Placed on Your Computer

File	Install Path	Description
InvoiceList.xml	*BRM_Home*/**apps/pin_inv_doc_gen**	XML file containing the details of accounts and bill units. The **InvoiceList.xml** file is passed along with **–accts_list** as an input parameter to **pin_inv_doc_gen.**
InvoiceList.xsd	*BRM_Home*/**apps/pin_inv_doc_gen**	XSD file that validates the InvoiceList.xml.
pin_inv_doc_gen.jar	*BRM_Home*/**apps/pin_inv_doc_gen**	JAR file for **pin_inv_doc_gen** application.
lib/ library	*BRM_Home*/**apps/pin_inv_doc_gen/lib**	Directory containing dependent **pin_inv_doc_gen** libraries.

Upgrading Existing Reports from BI Publisher 10*g* to BI Publisher 11*g*

To use BI Publisher 10*g* templates in BI Publisher 11*g*, make the following BI Publisher 11*g* modifications listed in Table 3–4:

Table 3–4 BI Publisher 10g Template Modifications for BI Publisher 11g

Modification	BI Publisher 10g	BI Publisher 11g
XML Structure	[data source = web service] <invoice> <POID>0.0.0.1 /bill 151665 3</POID> … </invoice>	[data source = sql query for bursting] <ROWSET> <INVOICE_POID>159696</INVOICE_POID> <ROW> <OBJ_ID0>159696</OBJ_ID0> <REC_ID>0</REC_ID> <BUFFER_BUF> <invoice> <POID>0.0.0.1 /bill 151665 3</POID> … </invoice> </BUFFER_BUF> </ROW> </ROWSET>
Referencing fields from the root	<?xdoxslt:set_variable($_XDOCTX,'currency',/invoice/BILLINFO/CURRENCY)?>	<?xdoxslt:set_variable($_XDOCTX,'currency',/ROWSET/ROW/BUFFER_BUF/invoice/BILLINFO/CURRENCY)?>
'Contains' function	<?if:contains(EVENT_OBJ,'adjustment')='true'?>	<?if:contains(EVENT_OBJ,'adjustment')?>
'Doesn't contain' function	contains(ITEM_OBJ,'writeoff_reversal')!='true'	not(contains(ITEM_OBJ,'writeoff_reversal'))

Configuring the pin_inv_doc_gen Utility

Configuring **pin_inv_doc_gen** involves:

- Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11g
- Configuring the docgen.sh File
- Changing Command-Line Parameters for pin_inv_doc_gen
- Setting Scheduler Configuration
- Configuring the Email Server
- Configuring HTTPS for Secure Communication
- Creating the XMLP_INVOICE_JOB Table in the Scheduler Database
- Loading Stored Procedures

Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11*g*

To configure the **Infranet.properties** file for **pin_inv_doc_gen**:

1. Go to *BRM_home*/**apps/pin_inv_doc_gen**.
2. Save the **Infranet.properties.sample** file as **Infranet.properties**.

   The **Infranet.properties.sample** file for the **pin_inv_doc_gen** utility includes the standard configuration entries. See "Using Configuration Files to Connect and Configure Components" in *BRM System Administrator's Guide*.

   Note: You must have read-write permissions to access the **/invoice** object. The BRM system administrator creates this user and grants the required permissions.

3. Open the **Infranet.properties** file in a text editor, and add your network entries and their values, as listed in Table 3–5.

Table 3–5 Infranet.properties.sample File Entries

Entry	Description
infranet.bip.password	Specifies the password. **Note:** The password can be encrypted with Advanced Encryption Standard (AES) for security.
infranet.bip.username	Specifies the name of the BI Publisher server.
infranet.bip.url	Specifies the URL of BI Publisher in the following format *http://BIP_Hostname:Port/xmlpserver* **Note**: Enable HTTPS and the SSL port for secure communication. See "Configuring HTTPS for Secure Communication".
infranet.burst.threadpool.chunksize	Specifies the maximum number of BRM invoices per BI Publishing bursting query.
infranet.burst.threadpool.maxsize	Specifies the maximum number of concurrent threads in the pool.
infranet.burst.threadpool.size	Specifies the number of core threads in the pool.
infranet.connection	Specifies the URL to the BRM service.
infranet.dmsearchargs.size	Specifies the number of account and bill unit pairs the utility should process at one time. The maximum value is **14**.
infranet.dupinvdir.path	Specifies the directory path for storing duplicate invoice documents.

Table 3–5 (Cont.) Infranet.properties.sample File Entries

Entry	Description
infranet.dupinvoice.watermark.angle	Specifies the angle of the watermark text. The default value is **45** (angle of text is 45 degrees). See the BI Publisher Java API documentation.
infranet.dupinvoice.watermark.colorr	Specifies the red component of the watermark text color. The default value is **0.7f**.
infranet.dupinvoice.watermark.colorg	Specifies the green component of the watermark text color. The default value is **0.7f**.
infranet.dupinvoice.watermark.colorb	Specifies the blue component of the watermark text color. The default value is **0.7f**.
infranet.dupinvoice.watermark.coordx	Specifies the x-coordinate of the start of the watermark text. The default value is **200f** (starting coordinate lower left x).
infranet.dupinvoice.watermark.coordy	Specifies the y-coordinate of the start of the watermark text. The default value is **250f** (starting coordinate lower left y).
infranet.dupinvoice.watermark.font	Specifies the font of the watermark text. The default value is **Arial**.
infranet.dupinvoice.watermark.fontsize	Specifies the size of the watermark text. The default value is **48**.
infranet.dupinvoice.watermark.text	Specifies the text to be displayed as the background watermark in the duplicate invoice. The default value is **DUPLICATE**.
infranet.http.notification.server	Specifies the name of the HTTP server used for notifications. **Important:** Enable HTTP notifications in BI Publisher. See the BI Publisher documentation for details.
infranet.http.notification.userName	Specifies the HTTP server login name.
infranet.http.notification.password	Specifies the HTTP server login password.
infranet.INITIAL_CONTEXT_FACTORY	Environment property that specifies the initial context factory to use. **Note**: Do not modify the default value, "weblogic.jndi.WLInitialContextFactory".
infranet.log.file	Specifies the log file name for the **pin_inv_doc_gen** utility.
infranet.log.level	Specifies the level of log for the **pin_inv_doc_gen** utility.
infranet.login.type	Specifies the type of login. A type 1 login requires the application to provide a user name and password. A type 0 login is a trusted login that comes through a Connection Manager (CM) proxy. It doesn't require a user name or password. Use **1** or **0**.
infranet.notify.http.when.success	Specifies whether to receive HTTP notification when a BI Publisher job is successful. By default, HTTP notification is enabled and set to **true**. To disable HTTP notification, set this entry to **false**.
infranet.notify.http.when.warning	Specifies whether to receive HTTP notification when a BI Publisher job contains warnings. By default, HTTP notification is enabled and set to **true**. To disable HTTP notification, set this entry to **false**.

Table 3–5 (Cont.) Infranet.properties.sample File Entries

Entry	Description
infranet.polling.sleeptime	Specifies the sleep time (in milliseconds) between polling calls while waiting for the BI Publisher schedule to complete. The default value is **5000** (5 seconds).
infranet.PROVIDER_URL	Environment property that specifies the BI Publisher provider URL in the following format: `t3s://BIP_Hostname:Port` where *BIP_Hostname* is where BI Publisher is installed and *Port* is the port number. **Note**: Enable HTTPS in BI Publisher by using the t3s (secure) protocol.
infranet.SECURITY_CREDENTIALS	Environment property that specifies the credentials of the principal for authenticating the caller to the service. **Note**: The password can be encrypted with Advanced Encryption Standard (AES) for security.
infranet.SECURITY_PRINCIPAL	Environment property that specifies the identity of the principal for authenticating the caller to the service.
infranet.threadpool.fetchsize	Specifies the number of records that can be fetched by the thread. The default value is **5**.
infranet.threadpool.maxsize	Specifies the maximum number of threads. The default value is **5**.
infranet.threadpool.size	Specifies the number of threads. The default value is **3**.

4. Save and close the file.

Configuring the docgen.sh File

To configure the **docgen.sh** file:

1. Open the *BRM_Home*/**apps/pin_inv_doc_gen/docgen.sh** file in a text editor.
2. Edit the default values available in the file to the values specific to your system environment.

> **Note:** The **pin_inv_doc_gen** utility runs only in the 32-bit mode. Set the Java executable in the **docgen.sh** file to the 32-bit Java version.

3. Save and close the file.

Changing Command-Line Parameters for pin_inv_doc_gen

To change the command-line parameters for **pin_inv_doc_gen** utility, you update the **docgen.sh** file:

1. Go to the *BRM_Home*/**apps/pin_inv_doc_gen**.
2. Open the **docgen.sh** file in a text editor.
3. Search for the following line:

```
invoicedocgen.pin_inv_doc_gen -status pending
```

4. Add or replace the **pin_inv_doc_gen** command-line parameter with the required parameter. For syntax and parameter usage, see "pin_inv_doc_gen".

5. Save and close the file.
6. In the command prompt, navigate to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
7. Enter the following command which runs the **docgen.sh** file:

   ```
   docgen.sh
   ```

   The **pin_inv_doc_gen** utility runs with the updated command-line parameter.

Setting Scheduler Configuration

To set scheduler configuration, see the discussion of setting scheduler configuration options in the BI Publisher documentation.

Configuring the Email Server

To configure the email server in BI Publisher, see the discussion of setting up delivery options in the BI Publisher documentation.

Configuring HTTPS for Secure Communication

BI Publisher can be configured to support HTTPS for secure communication. In addition to setting up HTTPS in BI Publisher, you also configure the **Infranet.properties** file and **pin_inv_doc_gen** utility.

To configure HTTPS for secure communication:

1. Enable HTTPS in BI Publisher. See the BI Publisher documentation for details.
2. Open the **Infranet.properties** file in a text editor.
3. Set and edit **infranet.bip.url** to use HTTPS and the SSL port. For example:

   ```
   infranet.bip.url=https://BIP_Hostname:SSL_port/xmlpserver
   ```

4. Modify **infranet.PROVIDER_URL** to use T3S and the SSL port. For example:

   ```
   infranet.PROVIDER_URL=t3s://BIP_Hostname:SSL_port
   ```

5. Launch **pin_inv_doc_gen** using **docgen.sh**.
6. Enter **yes** for:

   ```
   Is it a trusted certificate?
   ```

Creating the XMLP_INVOICE_JOB Table in the Scheduler Database

The XMLP_INVOICE_JOB table stores the mapping of job ID and the Invoice_POID for which an invoice document is generated.

To create XMLP_INVOICE_JOB table in the Scheduler database:

1. Go to *BRM_Home*/**apps/pin_inv_doc_gen**.
2. Open the **Create_Xmlp_Invoice_Job.sql** file.
3. Search for **<tablespacename>**.
4. Replace **<tablespacename>** with the tablespace name where all the BI Publisher Scheduler tables in the BI Publisher Scheduler database are created.
5. Save and close the file.

6. Go to *BRM_Home*/**apps/pin_inv_doc_gen**.
7. At the prompt, enter the following command which open SQL*Plus:

   ```
   sqlplus user_name/password@Database_Name
   ```

   where

   - *user_name* is the user name for the Scheduler database.
   - *password* is the password for the Scheduler database.
   - *Database_Name* is the SID of the Scheduler database.
8. At the SQL prompt, enter the following command:

   ```
   SQL> @Create_Xmlp_Invoice_Job.sql
   ```

9. Configure the Java Naming and Directory Interface (JNDI) for invoiceXREF to allow the **pin_inv_doc_gen** utility to connect to the Scheduler database:
   a. Log on to the Oracle WebLogic Console.
   b. Click **Services**.
   c. Click **Data Sources**.
   d. Click the **Lock and Edit** button.
   e. Create a new data source.
   f. Enter JNDI details:

      Name=invoiceXREF

      JNDI name= jdbc/OracleBRM/invoiceXREF
   g. Click **Next**.
   h. Enter the Scheduler database details that you used when you installed the XMLP_INVOICE_JOB table.
   i. Click **Next**.
   j. Select the server on which the BI Publisher software is installed.
   k. Click **Finish**.
   l. Click **Activate Changes**.
   m. Stop and restart the BI Publisher server.

Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems

To configure the BRM-BI Publisher invoicing integration to support multischema systems, do the following:

- Configure the bursting data source and query by loading stored procedures. See "Loading Stored Procedures".
- Create new JDBC data sources. See "Creating New JDBC Data Sources".

Loading Stored Procedures

To load stored procedures, do the following:

1. Go to *BRM_Home*/**apps/pin_inv_doc_gen.**
2. Enter the following commands:

```
sqlplus user/password@ORACLE_SID
>@invoice_bursting.plb;
>quit;
```

Creating New JDBC Data Sources

The BRM-BI Publisher invoicing integration packages invoicing reports and the data model for BRM primary schema. To create new JDBC sources to support BRM multischema, you follow these procedures. For more information, refer to the BI Publisher documentation.

Creating Data Source for Each BRM Schema

To create a data source for each BRM schema:

1. In a Web browser, enter the following URL:

   http://*BI_Publisher_host*:*port***/xmlpserver/**

   where:

   - *BI_Publisher_host* is the host name on which the BI Publisher server is installed.
   - *port* is the console port. The default port is **9704**.

     The BI Publisher Enterprise client opens.
2. On the global header, click **Administration**.
3. Under Data Sources, click **JDBC Connection**.
4. On the JDBC page, click the **Add Data Source** button.
5. Enter the following database connection details for the BRM schema:
   - In the **Data Source Name** field, enter the schema number in 0.0.0.*n* format. For example, 0.0.0.1 for the primary schema or 0.0.0.2 for the secondary schema.
   - In the **Driver Type** field, enter **Oracle 11g**.
   - In the **Database Driver Class** field, enter **oracle.jdbc.OracleDriver**.
   - In the **Connection String** field, enter your database connection details. For example:

     jdbc:oracle:thin:@*Hostname***:port:SID**

     where *Hostname* is the host name for the database that contains the secondary schema.
6. Click **Test Connection**, which verifies the connection to BRM schema.

   A confirmation message is displayed.
7. Click **Apply**, which saves your changes.
8. Repeat the previous steps for each schema.

Setting Up the Data Model Configuration for Multischema

To configure invoices for multischema:

1. In the **BRM_Invoices** reports directory, copy reports directory **0.0.0.1** to **0.0.0.***n*.

2. Rename the data model directory within **0.0.0**.n. For example, to set up the data model configuration for **0.0.0.2**, do the following:

```
cd BIP_Home/user_projects/domains/bifoundation_
domain/config/bipublisher/repository/Reports/BRM_Invoices
cp -r 0.0.0.1 0.0.0.2
cd 0.0.0.2
mv 0.0.0.1.xdm 0.0.0.2.xdm
```

3. Edit the data source name specified in "Creating Data Source for Each BRM Schema".

   For example, in **0.0.0.2/0.0.0.2.xdm/ _datamodel.xdm**, enter the data source name in **defaultDataSourceRef** and the BRM schema number in **CDATA**.

4. Set the URL of the BRM bursting report data model to the secondary schema by modifying **dataModel URL** in **0.0.0.2/BRM_Bursting_Invoice_Report.xdo/_report.xdo**.

5. To configure **pin_inv_doc_gen** for multischema changes, edit **docgen.sh**. For example, you add **-schema 0.0.0.***n* where *n* is the schema number after the **-status pending** flag of each schema.

   Note: The **-schema 0.0.0.***n* parameter is optional. If it is not specified, schema information comes from the **infranet.connection** value in the **Infranet.properties** configuration file; the default is **0.0.0.1.**

Generating BI Publisher Invoice Documents in BI Publisher 11*g*

You use the **pin_inv_doc_gen** utility to generate invoice documents by integrating the capabilities of BRM and BI Publisher. This utility takes a set of input parameters, generates the invoice document, and stores the instance of the invoice document generated in the BI Publisher Scheduler database. Based on the input parameters you pass to **pin_inv_doc_gen**, the utility fetches the corresponding invoice POID, BI Publisher report name, and layout template name of an **/invoice** object.

To configure **pin_inv_doc_gen** utility with the **Infranet.properties** file, see "Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11g".

To run the **pin_inv_doc_gen** utility:

1. Configure the **docgen.sh** file to execute the appropriate **pin_inv_doc_gen** command. To view the utility's syntax and parameters, see "pin_inv_doc_gen".
2. Go to the *BRM_Home*/apps/**pin_inv_doc_gen** directory.
3. Enter the following command which runs the **docgen.sh** file:

```
docgen.sh
```

Generating BI Publisher Invoice Documents for a List of Accounts

You can generate BI Publisher invoice documents for a list of accounts by using the **pin_inv_doc_gen** utility **-accts_list InvoiceList.xml** parameter. The number of data units (accounts and bill units) in the **InvoiceList.xml** file should be within the permissible range for the Data Manager (DM) to search the **/invoice** objects from the BRM database.

You can specify the number of account and bill unit pairs the **pin_inv_doc_gen** utility should process at one time by using the **infranet.dmsearchargs.size** parameter in the

Infranet.properties file. The maximum value is 14. For example, if the **InvoiceList.xml** file lists 20 account and bill unit pairs and the **infranet.dmsearchargs.size value** is set to 6, the **pin_inv_doc_gen** utility processes six account and bill unit pairs at a time.

In the **InvoiceList.xml** file, if you specify the account and bill unit pair of a corporate account, the invoice document is generated only for the specified account and bill unit. If the specified corporate account has subordinate accounts, the **/invoice** objects of the subordinate account are not selected for generating the invoice document.

To generate invoice documents for a list of accounts and their bill units:

1. Create an XML file that lists all of the accounts and bill units for which to create BI Publisher invoices. The XML file must be in the following format:

   Note: You can use the *BRM_Home*/**apps/pin_inv_doc_gen/InvoiceList.xml** file as an example.

```
<InvoiceDocGenConfig>
   <InvoicingList>
      <Account>101304</Account>
      <Billinfo>402678</Billinfo>
   </InvoicingList>
   <InvoicingList>
      <Account>405304</Account>
      <Billinfo>522678</Billinfo>
   </InvoicingList>
<InvoiceDocGenConfig>
```

2. Save and close the file.
3. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
4. Open the **docgen.sh** file in a text editor.
5. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

6. Replace with:

   ```
   invoicedocgen.pin_inv_doc_gen -accts_list InvoiceList
   ```

   where *InvoiceList* specifies the name and location of the file that includes a list of accounts and bill units for which to create invoice documents. This is the file you created in step 1.
7. Save and close the file.
8. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
9. Enter the following command, which runs the **docgen.sh** file:

   ```
   docgen.sh
   ```

Generating BI Publisher Invoice Documents Based on the Account Type

To generate invoices based on the account type:

1. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
2. Open the **docgen.sh** file in a text editor.
3. Search for the following line:

```
invoicedocgen.pin_inv_doc_gen -status pending
```

4. Do one of the following:
   - To generate invoice document for consumer account types, replace with:

     invoicedocgen.pin_inv_doc_gen -type consumer

   - To generate invoice document for corporate account types, replace with:

     invoicedocgen.pin_inv_doc_gen -type corporate

5. Save and close the file.
6. In the command prompt, navigate to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
7. Enter the following command which runs the **docgen.sh** file:

   docgen.sh

Generating Duplicate Invoice Documents with BI Publisher 11*g*

You can generate duplicate BI Publisher invoice documents for invoices that you have already generated by using the **pin_inv_doc_gen** utility **-status generated** parameter.

To generate duplicate BI Publisher invoice documents:

1. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
2. Make sure the **infranet.dupinvdir.path** entry in the utility's **Infranet.properties** file specifies the directory in which to write the file. See "Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11g".
3. Open the **docgen.sh** file in a text editor.
4. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

5. Replace with:

   invoicedocgen.pin_inv_doc_gen -status generated

6. Save and close the file.
7. In the command prompt, navigate to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
8. Enter the following command to execute the **docgen.sh** file:

   docgen.sh

> **Important:** Oracle recommends **DocMerger** as the utility to generate a duplicate invoice with a DUPLICATE watermark. However, you can use this utility only for PDF documents. Hence, you can generate an invoice document with a DUPLICATE watermark only if the original invoice document was generated in PDF.

Generating Invoice Documents for Non-Invoice Accounts

Regardless of the payment type or delivery method, any invoice in pending status can be printed. Therefore, you can generate invoice documents for non-invoice accounts

such as credit cards. BI Publisher generates PDFs for any invoice with a non-invoice payment type and stores them in the BI Publisher database.

To deliver invoice documents for non-invoice accounts, configure the delivery method of the bursting query by adding a delivery type (such as FTP) to the DEL_CHANNEL parameter and by adding the appropriate values to PARAMETER 1 through PARAMETER 8 as described in the *Oracle Fusion Middleware Report Designer's Guide for Oracle Business Intelligence Publisher*.

Generating Invoices for Hierarchical Accounts with BI Publisher 11*g*

Hierarchical groups enable customers to pay other customers bills. Hierarchical accounts form a parent-child relationship, and parent and child accounts are on the same billing cycle. Generating trial and regular invoices with BI Publisher is suited for hierarchical accounts that contain large amounts of bill units due to the following:

- Each bill unit is processed within its own transaction, which is later used in the processing cycle.
- Each bill unit is not loaded into RAM, which reduces RAM utilization.
- Collation is run after the generation of each bill unit within the account's hierarchy. Each bill unit is arranged in a predetermined sequence and by default is rendered in PDF.

Note: By default, if any bill unit in the hierarchy fails to generate, collation is halted, and an invoice is not produced.

How Trial Invoicing Works for Hierarchical Accounts in BI Publisher 11*g*

You generate a trial invoice to validate billing charges and check for inaccuracies before creating the final bill.

When you run the **pin_trial_bill_accts** utility to perform trial billing with BI Publisher, the PCM_OP_BILL_MAKE_TRIAL_BILL opcode is called to create the trial invoices and collect revenue assurance data for the trial billing run.

In hierarchical account billing, charges for the subordinate accounts are calculated first and then rolled up to the parent account, as follows:

1. When the **pin_trial_bill_accts** utility is run with the **-pay_type** parameter and the payment method subordinate ID **10007**, the PCM_OP_BILL_MAKE_TRIAL_BILL opcode creates a **/invoice/trial** object for each subordinate account.
2. When the **pin_trial_bill_accts** utility is run with the **-pay_type** parameter and the specified payment method parent ID, the PCM_OP_BILL_MAKE_TRIAL_BILL opcode is called to trial bill each account. The PCM_OP_BILL_MAKE_TRIAL_BILL opcode calculates the parent account bill totals using the subordinate totals from the PCM_OP_BILL_MAKE_BILL opcode and generates parent invoices.

   For more information, see "How Trial Billing Works" in *BRM Configuring and Running Billing*.
3. The PCM_OP_BILL_MAKE_TRIAL_BILL opcode passes the PIN_FLD_INV_FLAGS field's value to the PCM_OP_INV_MAKE_INVOICE opcode. The PCM_OP_INV_MAKE_INVOICE opcode decides from the value whether to create a subordinate or parent trial invoice:
   - If the value is PIN_INV_TYPE_SUBORDINATE, a subordinate invoice is created.

- If the value is PIN_INV_TYPE_PARENT, a parent invoice is created.

4. The PCM_OP_INV_MAKE_INVOICE opcode calls the PCM_OP_INV_POL_PREP_INVOICE policy opcode, which prepares invoice information prior to formatting and storing.

   The PCM_OP_INV_POL_PREP_INVOICE policy opcode checks the value of the PIN_FLD_FLAGS field. If the value is PIN_INV_TYPE_TRIAL_INVOICE plus PIN_INV_TYPE_SUBORDINATE the PCM_OP_INV_POL_PREP_INVOICE policy opcode adds the PIN_FLD_BILLS array and the PIN_FLD_CHECK_SPLIT_FLAGS field, which are required to generate the trial invoices for the subordinate's parent.

   The PIN_FLD_BILLS array contains the following fields:

   - PIN_FLD_START_T
   - PIN_FLD_END_T
   - PIN_FLD_AR_BILLINFO_OBJ
   - PIN_FLD_DUE
   - PIN_FLD_ADJUSTED
   - PIN_FLD_WRITEOFF
   - PIN_FLD_DISPUTED
   - PIN_FLD_RECVD

Setting Up Invoicing for Hierarchical Accounts with BI Publisher 11*g*

To set up invoicing for hierarchical accounts with BI Publisher:

1. Ensure that all the preliminary configurations required for billing are completed. See *BRM Configuring and Running Billing*.
2. Enable the BI Publisher 11*g* integration. See "Enabling the BRM-BI Publisher Integration".
3. Set your system to generate invoice documents using BI Publisher 11*g*. See "Setting Up Your System to Generate Invoice Documents Using BI Publisher".
4. Verify that BRM is set up with the required templates to generate hierarchical invoices. See "Specifying the BI Publisher Report and Template" and "Invoice Template for Hierarchical Accounts".
5. Associate bill units with a BI Publisher 11*g* invoice and report. See "About Associating Bill Units with a BI Publisher Invoice and Report".
6. Load the business profile information into the BRM database. See "Loading Invoicing Business Profiles into the Database".
7. Configure the **pin_inv_doc_gen** utility. See "Configuring the pin_inv_doc_gen Utility".
8. Verify that both BI Publisher 11*g* and BRM are set to generate the final invoice either with or without subordinate bill units. See "Setting Subordinate Account Processing in BI Publisher 11g and BRM for Hierarchical Accounts".
9. Verify that the *BRM_Home***/apps/pin_trial_bill/pin.conf** file's **Threshold** entry is commented out. Setting thresholds limits the amount of subordinates that are invoiced, which leads to errors when the parent account is trial billed.

Invoice Template for Hierarchical Accounts

Use the **BRM_Corporate_Invoice.rtf** template for generating hierarchical account invoices. The **BRM_Corporate_Invoice.rtf** template includes the following layout and formatting:

- Depending on how the hierarchical account tax is calculated, the template adds one of the following labels:
  - If the tax is calculated at the subordinate level, a **Subord Total (Tax Included)** label is added on the first page of the invoice.
  - If the tax is calculated at the parent level, a **Subord Total (Tax Not Included)** label is added on the first page of the invoice.
- To distinguish the trial invoice from the regular invoice a **Trial Invoice** watermark is added to all the pages after the first page. You can change the watermark text by editing the PIN_FLD_MESSAGE field's value in the PCM_OP_INV_POL_PREP_INVOICE flist.

Setting Subordinate Account Processing in BI Publisher 11*g* and BRM for Hierarchical Accounts

---

Important: When generating invoices for hierarchical accounts both BI Publisher and BRM must be set to process the final invoice either with or without subordinate bill units:

- If you require an invoice that includes subordinate details, set BRM to process subordinate bill units and BI Publisher to generate a single invoice from a group of invoices.
- If you require an invoice that does not include subordinate details, set BRM to not process subordinate bill units and BI Publisher to generate individual invoices.

In BRM and BI Publisher you can choose to include the full subordinate account details in the parent invoice or not to include the full subordinate details.

- When you include the full subordinate account details, a separate invoice is generated for each subordinate bill unit and the totals rolled up into the parent's invoice. When the final invoice is generated, each subordinate invoice is collated and merged into the final invoice.
- When you do not include the full details for hierarchical accounts, only one parent invoice is created, which contains totals from the subordinate accounts.

To set subordinate account processing in BI Publisher and BRM for hierarchical accounts:

1. In BRM set the threshold for the maximum amount of subordinate bill units allowed in the parent invoice with the **ThresholdSubordsSummary** and **ThresholdSubordsDetail** business parameters.
   - To generate an invoice for each subordinate account, which are included in the final invoice, set the threshold value higher than the number of subordinate bill units.
   - To generate an invoice without subordinate account details, set the threshold value less than or equal to the number of subordinate bill units.

For more information on how to set the **ThresholdSubordsSummary** and **ThresholdSubordsDetail** business parameters, see "Setting Defaults for Hierarchical Group Invoices".

Note:

- A value of **0** disables the threshold parameter. BRM does not create separate bill units for subordinate accounts.
- If subordinate details are not captured in the final invoice they are still available in the **/invoice** object of the subordinate bill info.

2. In BI Publisher set the **BRM_Bursting_Invoice_Report** to generate individual invoices or generate a single invoice from a group of invoices, as follows:
   a. Log in to BI Publisher.
   b. From the menu select **Catalog** and then select **BRM-Invoices**.
   c. From the **BRM-Invoices** section, click the data model **0.0.0.1** link.

      The **0.0.0.1** page appears.
   d. In the **Data Model** section, expand the **Bursting** list and select **BRM_Bursting_Invoice_Report_Bursting_Query**.
   e. From the **Split By** list in the **BRM_Bursting_Invoice_Report_Bursting_Query** section, select one of the following:
      – To generate a single invoice from a group of invoices, select **/ROW_SET/LIST_ROW/ROW/BILL_NO**.
      – To generate individual invoices, select **/ROW_SET/LIST_ROW/ROW/OBJ_ID0**.
   f. Save the data model **0.0.0.1**.
   g. Exit BI Publisher.

   By default the BRM report **BRM_Bursting_Invoice_Report** is set to create the final invoice from a group of invoices for hierarchical accounts. Invoices with the same bill number are generated and then collated and merged into the parent invoice as a single PDF.

Creating Hierarchical Account Trial Invoices with BI Publisher 11*g*

To create hierarchical account trial invoices with BI Publisher:

1. Go to the *BRM_Home*/**apps/pin_trial_bill** directory.
2. Run the following command, which creates trial invoices for subordinate accounts:

   ```
   pin_trial_bill_accts -pay_type 10007
   ```

3. Run the following command, which creates trial invoices for the parent accounts:

   ```
   pin_trial_bill_accts -pay_type  ID
   ```

   where *ID* is the element ID of the payment method for the parent account. For more information on payment method IDs, see "Understanding Payment Methods" in *BRM Managing Customers*.
4. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.

5. Enter the following command to execute the **docgen.sh** file:

```
docgen.sh
```

Creating Hierarchical Account Regular Invoices with BI Publisher 11*g*

To create hierarchical account invoices with BI Publisher:

1. Go to the *BRM_Home*/**apps/pin_billd** directory.
2. Run the following command, which creates billing for subordinate accounts:

```
pin_bill_accts -pay_type 10007
```

3. Run the following command, which creates billing for the parent accounts:

```
pin_bill_accts -pay_type  ID
```

   where *ID* is the element ID of the payment method for the parent account. For more information on payment method IDs, see "Understanding Payment Methods" in *BRM Managing Customers*.

4. Go to the *BRM_Home*/**apps/pin_inv_accts** directory.
5. Run the following command, which creates regular invoices for subordinate accounts:

```
pin_inv_accts -hierarchy
```

6. Run the following command, which creates regular invoices for the parent accounts:

```
pin_inv_accts -pay_type  ID
```

7. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
8. Enter the following command to execute the **docgen.sh** file:

```
docgen.sh
```

Regenerating Failed Invoices for Hierarchical Accounts

When an error occurs in trial billing, generation of the bill unit's invoice stops. You must rerun trial billing on the subordinate accounts before rerunning trial billing on the parent account. You must also regenerate trial invoices on the parent accounts that did not contain an error.

To regenerate invoices for hierarchical accounts that failed the last trial billing run:

1. Resolve the errors.
2. Go to the *BRM_Home*/**apps/pin_trial_bill** directory.
3. Run the following command, which reruns trial billing on subordinate accounts that contained errors in the last billing run:

```
pin_trial_bill_accts -pay_type 10007 -retry
```

4. Run the following command, which reruns trial billing on the parent accounts that contained an error in the last billing run:

```
pin_trial_bill_accts -pay_type ID -retry
```

   where *ID* is the element ID of the payment method for the parent account. For more information on payment method IDs, see "Understanding Payment Methods" in *BRM Managing Customers*.

5. Run the following command, which generates trial invoicing on the parent accounts that did not contain an error in the last billing run:

```
pin_trial_bill_accts -pay_type ID
```

6. Go to the *BRM_Home*/**apps/pin_inv_doc_gen** directory.
7. Enter the following command to execute the **docgen.sh** file:

```
docgen.sh
```

Purging Trial Invoices

To purge trial invoices, run the **pin_trial_bill_purge** utility.

By default, **pin_trial_bill_purge** purges invoices with the **/invoice/trial** POID type. If a custom **/invoice** subclass exists, invoices with **/invoice/***custom_subclass***/trial** POID type are purged.

> **Caution:** If the **/invoice** class is partitioned, running the purge utility (**partition_utils -o**) on **/invoice** purges both regular invoices and trial invoices.

For a description of the syntax and parameters of this utility, see "pin_trial_bill_purge" in *BRM Configuring and Running Billing*.

For more information about partitioning and purging database tables, see the following in *BRM System Administrator's Guide*:

- Partitioning Database Tables
- About Purging Data

Deferred Taxation Limitations for Hierarchical Accounts

BRM offers two options for deferred taxation: taxes can be consolidated into a single item for both the parent and subordinate bill units, or taxes can be calculated for each individual nonpaying child bill unit, which are listed as separate items on the parent bill:

- When taxes are consolidated into a single item for both the parent and subordinate bill unit, the total tax is calculated at the parent level for the entire hierarchy using an aggregated total due as its basis. In this instance, the **cycle_tax_interval** entry in *BRM_Home*/**sys/cm/pin.conf** configuration file is set as follows:

  ```
  -fm_bill cycle_tax_interval billing
  ```

  > **Important:** This option is not supported when using trial billing or trial invoicing with BI Publisher for Hierarchical Accounts.

- When taxes are calculated for each individual nonpaying child bill unit, the total tax is a summation of taxes that were calculated for each bill unit. In this instance the **cycle_tax_interval** entry in *BRM Home*/**sys/cm/pin.conf** configuration file is set as follows:

  ```
  -fm_bill cycle_tax_interval accounting
  ```

Important: This option is supported when using trial billing or trial invoicing with BI Publisher for Hierarchical Accounts, with the following limitations.

- The total tax value can contain small rounding errors caused by the system calculating taxes on smaller totals of each bill unit rather than the grand total.
- The basis for determining the tax rate is with the individual subordinate's bill unit rather than the parent. To avoid tax rate discrepancies between trial and production runs, all tax-affecting attributes (for example, address information and tax exemptions) for all bill units within the hierarchy must be synchronized to those of the parent bill unit.

Trouble Shooting Issues with Hierarchical Account Invoice Generation

This section lists problems you might encounter while trying to generate hierarchical account invoices and provides information on how to fix them.

Problem: Subordinate invoices not generating

Scenario: There is one parent account and two subordinate accounts. The **ThresholdSubordsSummary** and **ThresholdSubordsDetail** business parameters are set to **1**. The following command is run:

```
pin_inv_accts -pay_type 10018 -verbose
```

Solution: To create subordinate invoices the **pin_inv_accts** utility requires the **-hierarchy** parameter. Run the following commands:

```
pin_inv_accts -hierarchy -verbose
pin_inv_accts -pay_type 10018 -verbose
```

Problem: Though invoice generation is successful, the billing amounts for the parent account in the final invoice are incorrect

Scenario: There is one parent account and two subordinate accounts. The **ThresholdSubordsSummary** and **ThresholdSubordsDetail** business parameters are set to **1**. The following commands are run:

```
pin_inv_accts -pay_type 10007 -verbose
pin_inv_accts -pay_type 10018 -verbose
```

Solution: The BI Publisher template is configured with a bursting option, which is using the same invoice details twice. Change the BI Publisher template to a non bursting option.

For more information, see "Setting Subordinate Account Processing in BI Publisher 11g and BRM for Hierarchical Accounts".

Problem: Multiple /invoice objects are created instead of one and after running the docgen.sh script the invoice is generated but the amounts are incorrect

Scenario: There is one parent account and two subordinate accounts. The **ThresholdSubordsSummary** and **ThresholdSubordsDetail** business parameters are set to **0**. The following commands are run:

```
pin_inv_accts -pay_type 10007 -verbose
```

```
pin_inv_accts -pay_type 10018 -verbose
```

Solution: BI Publisher is set to create invoices for subordinate accounts. Whereas the threshold business parameters setting in BRM is set to not create invoices for subordinate accounts. BI Publisher and BRM are in conflict. To solve the conflict, change the BI Publisher template to a non bursting option.

For more information, see "Setting Subordinate Account Processing in BI Publisher 11g and BRM for Hierarchical Accounts".

Problem: Error when running multiple trial invoicing runs for standalone accounts

Scenario: Unable to run multiple instances of trial billing on a standalone account. Invoices are not created for the second run. The following commands are run:

```
pin_trial_bill_accts -pay_type 10001 -verbose
pin_trial_bill_accts -pay_type 10001 -verbose
```

Solution: As the trial bill number is the same for both trial invoices, BI Publisher is attempting to collate each generated invoice for the final invoice. Include the **docgen.sh** script after each run to create a final invoice for each instance, as follows:

```
pin_trial_bill_accts -pay_type 10001 -verbose
doc_gen.sh
pin_trial_bill_accts -pay_type 10001 -verbose
doc_gen.sh
```

Note: The trial bill number is used to collate invoices in BI Publisher 11*g*.

Storing the Invoice Document

You can store invoice documents in the BI Publisher Scheduler database. Oracle recommends configuring a separate database, other than the BRM database, to store invoice documents. See "Setting Scheduler Configuration".

Sending Invoice Documents to the Customers

After generating the invoice document, you can email it to the customers. To send the invoice document through email, you must:

- Configure the Scheduler database in BI Publisher. See "Setting Scheduler Configuration".
- Configure the email server and FTP in BI Publisher. See "Configuring the Email Server".
- Configure the delivery option that is retrieved from the **/payinfo** object. For more information, see *BRM Managing Customers*.

Customizing Invoices

Important: To customize the invoice layout, you should have template-designing experience. See the BI Publisher documentation for instructions on how to create and design layout templates.

You can customize the invoice documents by:

- Customizing Invoice Layout Templates
- Enriching Invoice Data

Customizing Invoice Layout Templates

You can customize the invoice layout template by:

- Updating the existing layout template file
- Adding a new layout template file

Updating the Invoice Layout Template File

You can update the existing layout template file by using BI Publisher Desktop (Template Builder) and Microsoft Word. For more information about updating the layout template in RTF, see the discussion of creating an RTF template in the BI Publisher documentation.

Adding a New Invoice Layout Template

To add a new layout template:

1. Create a new layout template in BI Publisher. For information on how to create a layout template, see creating an RTF template in the BI Publisher documentation.
2. Create a new invoicing **/config/business_profile** object in BRM to reflect the addition of the new layout template. See "Specifying BI Publisher Invoice Report and Template Names in BRM" and "About Associating Bill Units with a BI Publisher Invoice and Report".

Enriching Invoice Data

After receiving invoice data from the BRM database, you might want to enrich the invoice data with marketing messages, customer information available in a customer relationship management (CRM) application, and special messages from the accounting department. BI Publisher provides this functionality by retrieving data from additional data sources.

Important: The sample layout templates that are available with BRM-BI Publisher invoicing integration package display data fetched from only the BRM database. If you want to enrich your invoice document with additional data sources, you need to customize the sample layout templates. See "Customizing Invoice Layout Templates".

To enrich BRM invoice data:

- The **/invoice** objects containing data in XML format should be present in the BRM database.
- The additional data source must be configured in BI Publisher to enrich the invoice data. See the discussion of setting up data sources in the BI Publisher documentation.
- Configure data and bursting queries to fetch data from custom data source.

For detailed instructions on creating or updating BI Publisher reports based on multiple data sources, see the discussion of creating BI Publisher reports based on various data sources in the BI Publisher documentation.

Specifying the Default Format in Which to Store Invoices in BRM

By default, BRM stores invoices in XML format. You can configure BRM to store invoices in flist format by modifying a field in the **invoicing** instance of the **/config/business_params** object.

You modify the **/config/business_params** object by using the **pin_bus_params** utility. For information on this utility, see "pin_bus_params" in *BRM Developer's Guide*.

To specify the default format in which to store invoices:

1. Go to the *BRM_Home*/**sys/data/config** directory.
2. Run the following command, which creates an editable XML file for the **invoicing** parameter class:

   ```
   pin_bus_params -r BusParamsInvoicing bus_params_Invoicing.xml
   ```

   This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. To place this file in a different directory, specify the path as part of the file name.
3. Open the **bus_params_Invoicing.xml.out** file.
4. Search for following line:

   ```
   <InvoiceStorageType>1</InvoiceStorageType>
   ```

5. Do one of the following:
   - To specify flist as the output format, set **InvoiceStorageType** to **0**.
   - To specify XML as the output format, set **InvoiceStorageType** to **1**.
6. Save this file as **bus_params_Invoicing.xml**.
7. Go to the *BRM_Home*/**sys/data/config** directory, which includes support files used by the **pin_bus_params** utility.
8. Run the following command, which loads this change into the appropriate **/config/business_params** object:

   ```
   pin_bus_params PathToWorkingDirectory/bus_params_Invoicing.xml
   ```

   where *PathToWorkingDirectory* is the directory in which **bus_params_Invoicing.xml** resides.

Caution: BRM uses the XML in this file to overwrite the existing **invoicing** instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM invoicing configuration.

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

9. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

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

10. Stop and restart the CM. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

11. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

4

Designing and Generating Invoices in Oracle Business Intelligence Publisher 10*g*

This chapter describes how to design, generate, and customize Oracle Communications Billing and Revenue Management (BRM) invoice documents using Oracle Business Intelligence (BI) Publisher 10*g*.

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

- Basic database administration concepts. See your database documentation.
- BI Publisher 10*g* functions. See your BI Publisher documentation.

Note: For information on integrating BRM with Oracle BI Publisher 11*g*, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 11g".

About BRM Integration with BI Publisher for Invoicing

BRM comes with a pre-integrated invoicing framework. This framework uses BI Publisher as the publishing application, allowing users to create more stylized and detailed invoices in PDF format. BRM also includes sample RTF templates for individual customers and for corporate customers. In these templates, some of the core business functions are pre-built and can be customized. You can configure and extend these templates for your specific business needs.

The integration methodology is based on the J2EE framework and Web Services-based communication, enabling a complete open-ended, seamless and scalable solution. BI Publisher allows you to choose from a variety of desktop tools, such as Microsoft Word and Adobe Acrobat, to create document templates. It can also access multiple data sources, such as database and HTTP, and it provides multiple document output options, such as email and FTP.

The pre-integrated invoicing framework eliminates the need for any proprietary invoice design tools, resulting in lowered costs. BI Publisher leverages familiar desktop software, so using the software requires minimal learning.

To use this feature, you must install BI Publisher, BI Publisher Desktop, and a web services component.

Overview of BRM and BI Publisher Invoice Generation

BI Publisher is an enterprise reporting solution to author, manage, and deliver all types of formatted documents. You can customize the layout of the generated invoice

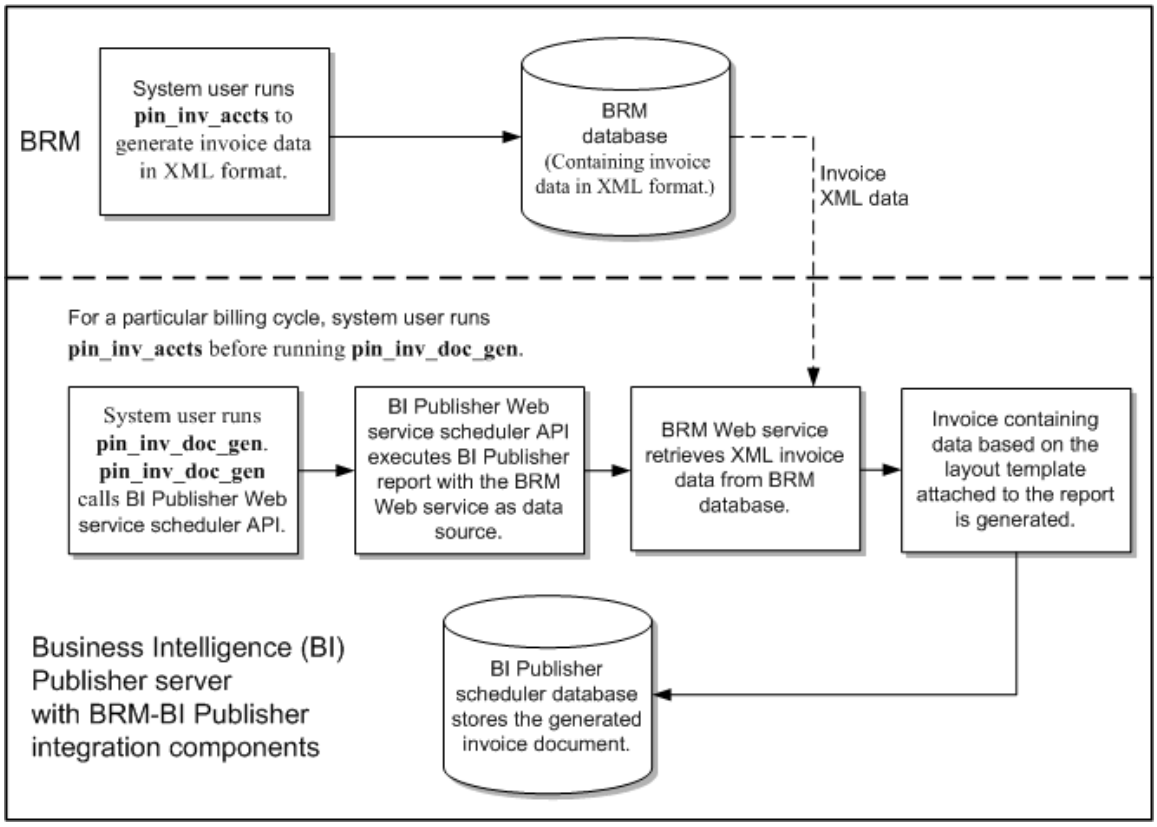
document using the template builder capabilities of BI Publisher. A typical invoice document generated using BRM-BI Publisher integration is in "Understanding Invoice Layout".

When you use the BRM-BI Publisher integration:

- BRM generates the invoicing data in XML format and then passes the data to BI Publisher.
- BI Publisher formats the invoice and stores it in the BI Publisher database.

Figure 4–1 shows the BRM and BI Publisher invoice generation process:

Figure 4–1 BRM and BI Publisher Invoice Generation Process



About the Invoicing Process

The BRM-BI Publisher integration generates invoice documents as follows:

> **Note:** The BRM-BI Publisher integration must be enabled. See "Enabling the BRM-BI Publisher Integration".

1. **BRM associates bill units with a BI Publisher invoice and report**. When accounts are created, BRM associates each bill unit with a BI Publisher invoice report and layout template. See "About Associating Bill Units with a BI Publisher Invoice and Report".
2. **Integrating BRM and BI Publisher for generating invoice documents.** To generate invoice documents using BRM-BI Publisher integration framework, you must enable the integration between BRM and BI Publisher. See Enabling the

BRM-BI Publisher Integration.

3. **BRM generates a bill.** BRM creates a bill for each account bill unit when it runs the **pin_bill_accts** utility as part of the daily billing script. BRM needs a bill before generating an invoice. See "Running Billing Utilities" in *BRM Configuring and Running Billing*.

4. **BRM generates the invoice and stores it in the BRM database.** When the **pin_inv_accts** utility is executed, it stores the invoice data in an **/invoice** object in the BRM database. See "Generating Invoices".

> **Note:** To generate invoice documents in BI Publisher, you must store the invoice data in XML format. See "About Formats for Storing Invoices". If the invoice data is stored in pin_flist format, you must perform additional steps when deploying the custom BRM Web service. See "Deploying the BRM Web Service".

5. **The pin_inv_doc_gen utility**:

   - **Executes BI Publisher reports**. This utility, based on the input parameters, invokes and executes appropriate BI Publisher reports for invoice documents. It executes a BI Publisher invoicing report, with the BRM Web service as the data source, through a scheduled job. See "Generating BI Publisher Invoice Documents".

   - **Calls PublicBRMfetchInvoiceXMLService to pull the XML data from the BRM database.** The BRM Web service, PublicBRMfetchInvoiceXMLService, pulls the invoice data in XML format from the BRM database and returns the XML data necessary to generate invoice documents by the **pin_inv_doc_gen** utility.

   - **Stores the invoice document in the BI Publisher database.** The utility stores the generated invoice documents in the BI Publisher Scheduler database. See "Storing the Invoice Document".

About Associating Bill Units with a BI Publisher Invoice and Report

When the BRM-BI Publisher integration is enabled, BRM automatically associates bill units with a BI Publisher report name and invoice template name during the account creation process. When an account is created, BRM performs the following for each bill unit (**/billinfo** object) in the account:

- Determines the BI Publisher invoice report and template that the bill unit qualifies for by reading the **/config/business_profile** object. This object defines your invoice types, the criteria a bill unit must meet for the invoice type, and the BI Publisher invoice report and template names associated with the invoice type. For example, a **/config/business_profile** might define the following in Table 4–1 for a regular bill:

Table 4–1 Business Profile Example

Invoice Type	Criteria	BI Publisher Invoice Report and Template Names
Monthly billing	The **/billinfo** object's PIN_FLD_WHEN field is set to **1**.	**monthly_invoice_report** and **monthly_invoice**
Quarterly billing	The **/billinfo** object's PIN_FLD_WHEN fields is set to **3**.	**quarter_invoice_report** and **quarter_invoice**

- Creates an **/associated_bus_profile** object for the bill unit. This object stores the following information associated with invoicing for the bill unit as an element in a template array called PIN_FLD_TEMPLATE_ARRAY.
  - PIN_FLD_TEMPLATE_NAME. The Template name configured in the pair key Template_Name of the corresponding invoicing **/config/business_profile** object.
  - PIN_FLD_REPORT_NAME. The Report name configured in the pair key Report_Name of the corresponding invoicing **/config/business_profile** object.
  - PIN_INV_TYPE. The type of invoice stored as PIN_INV_TYPE_REGULAR or PIN_INV_TYPE_CORRECTIVE.
- Associates the bill unit with its **/associated_bus_profile** object by populating the **/billinfo** object's PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.

BRM creates an **/associated_bus_profile** object for each bill unit in an account by calling the PCM_OP_CUST_CREATE_ASSOCIATED_BUS_PROFILE opcode. This opcode is called internally by the PCM_OP_CUST_CREATE_BILLINFO opcode during the account creation process.

Whenever invoice business profiles are modified in the **/config/business_profile** object, use the PCM_OP_CUST_SET_ASSOCIATED_BUS_PROFILE opcode to update all related **/associated_bus_profile** objects.

About BRM-Business Intelligence Publisher Invoicing Integration Package Components

The BRM-BI Publisher invoicing integration package contains:

- The Java integration utility, **pin_inv_doc_gen**. See "Generating BI Publisher Invoice Documents".
- Custom BRM Web service.
- Six BI Publisher reports for generating invoice documents for consumer and corporate accounts. See "About BI Publisher Reports for Invoice Document Generation".
- Six sample layout templates in rich text format (RTF) for consumer and corporate accounts. See "About Invoice Layout Templates for Invoice Document Generation".

Designing Invoices

You can use the following capabilities of BI Publisher to design invoice documents:

- Customizing invoice format: You can format the sample invoice layout templates or create new invoice templates. See "Customizing Invoice Layout Templates".
- Enriching invoice data: You can enrich the data that is displayed in the invoice by getting data from various sources. See "Enriching Invoice Data".

About Invoice Layout Templates for Invoice Document Generation

The BRM-BI Publisher invoicing integration package contains six layout templates in RTF for the consumer and corporate accounts. The layout templates have the XSL formatting code that is understood by the BI Publisher reporting engine that guides the look and feel of the invoice document.

Layout templates that are part of the BRM-BI Publisher invoicing integration package are based on the invoice document and whether the invoice is intended for a corporate or consumer customer. If the BRM-BI Publisher integration framework is enabled, when you create an account, the bill units (**/billinfo** objects) of the account are associated with an **/associated_bus_profile** object. The **/associated_bus_profile** object contains the report and template names that are used for generating invoice documents for this account on the BI Publisher server. See "Specifying BI Publisher Invoice Report and Template Names in BRM".

Default Templates for Regular Invoices

BRM provides the following default templates for regular invoices:

- BRM_Corporate_Invoice.rtf
- BRM_Consumer_Invoice.rtf

The report files that Oracle Business Intelligence Publisher associates with each of the default templates for regular invoices are:

- BRM_Corporate_Invoice_Report.xdo
- BRM_Consumer_Invoice_Report.xdo

Default Templates for Replacement Invoices

BRM provides the following default **Replacement Invoice** templates:

- BRM_Corporate_Replacement_Invoice.rtf
- BRM_Consumer_Replacement_Invoice.rtf

When you use the default template for a **Replacement Invoice**, the resulting document contains all the line items and information from the previous bill or invoice. In addition, it lists the previous bill number, the previous bill date, the previous bill totals and the corrections totals. The Item summary section shows the previous totals, the correction totals and the current totals for each item. The events details section lists the previous total, correction amount and current total for each event.

The report files that Oracle Business Intelligence Publisher associates with each of the **Replacement Invoice** templates are:

- BRM_Corporate_Replacement_Invoice_Report.xdo
- BRM_Consumer_Replacement_Invoice_Report.xdo

Default Templates for Invoice Correction Letters

BRM provides the following default **Invoice Correction Letter** templates:

- BRM_Corporate_Correction_Invoice.rtf
- BRM_Consumer_Correction_Invoice.rtf

As the name implies, an **Invoice Correction Letter** is in a letter format. When you use the default template for an **Invoice Correction Letter**, the resulting document contains a brief explanation of the correction, a bill summary section and the details of only the corrections made to the previous bill or invoice. The **Invoice Correction Letter** displays the previous bill number, the previous bill date, the previous bill total, the total correction amount and the current total.

The report files that Oracle Business Intelligence Publisher associates with each of the **Invoice Correction Letter** templates is:

- BRM_Corporate_Correction_Invoice_Report.xdo

- BRM_Consumer_Correction_Invoice_Report.xdo

About BI Publisher Reports for Invoice Document Generation

The BRM-BI Publisher invoicing integration package contains two reports for consumer and corporate accounts. Details of the construction of these reports are:

- The data source of the sample BI Publisher reports is the PublicBRMfetchInvoiceXMLService Web service.
- Each report has a layout template in RTF associated with it that decides the look and feel of the invoice document.
- The output formats supported for the invoice document are PDF, HTML, and XML (data). The default output format specified in the reports is PDF.

> **Note:** For the invoice documents to support data from various data sources, you need to configure additional data sources in the sample reports and customize the sample layout template.

Reports that are part of the BRM-BI Publisher invoicing integration package:

- BRM_Consumer_Invoice_Report.xdo
- BRM_Corporate_Invoice_Report.xdo

Setting Up Your System to Generate Invoice Documents Using BI Publisher

To use the BRM-BI Publisher integration framework to generate invoice documents:

- Install BI Publisher. To install BI Publisher, follow the instructions in the BI Publisher documentation.
- In BRM, specify the BI Publisher invoice report and layout templates names. See "Specifying BI Publisher Invoice Report and Template Names in BRM".
- In BRM, specify the events that you want included in your invoices by editing the **events.file** file and then loading it into the BRM database with the **pin_load_invoice_events** utility. See "Including Payment, A/R, and Taxation Details in Invoices".
- Install the BRM-BI Publisher invoicing integration package on the BI Publisher server. See "Installing BRM-BI Publisher Invoicing Integration Package".
- Configure the **pin_inv_doc_gen** utility. See "Configuring the pin_inv_doc_gen Utility".
- Deploy the BRM Web service on your BI Publisher server. See "Deploying the BRM Web Service".
- Connect the PublicBRMfetchInvoiceXML Web service to the BRM database. See "Configuring How PublicBRMfetchInvoiceXMLService Connects to the BRM Database".

Specifying BI Publisher Invoice Report and Template Names in BRM

When the BRM-BI Publisher integration is enabled, BRM automatically performs the following during the bill unit (**/billinfo** object) creation process:

- Reads the invoicing configuration business profile (**/config/business_profile** object) to determine which BI Publisher invoice report and layout template the bill unit should be associated with.
- Creates an **/associated_bus_profile** object for the bill unit. This object specifies the names of the BI Publisher invoice report and layout template to use.
- Links the bill unit to the **/associated_bus_profile** object it created.

To create an invoicing configuration business profile:

1. Enable the BRM-BI Publisher integration. See "Enabling the BRM-BI Publisher Integration".
2. Specify the requirements for a bill unit to be associated with an invoicing configuration business profile by creating a validation template. See "Creating Bill Unit Validation Templates for Invoices".
3. Specify the validation template, invoice report, and layout template to be associated with the bill unit. See "Specifying the BI Publisher Report and Template".
4. Load the business profile information into the BRM database by using the **load_pin_business_profile** utility. See "Loading Invoicing Business Profiles into the Database".
5. If your system includes accounts that were created before you integrated BRM invoicing with BI Publisher, associate your existing **/billinfo** objects with /**associated_bus_profile** objects. See "Associating Pre-Existing Bill Units with Business Profiles".

Enabling the BRM-BI Publisher Integration

By default, BRM-BI Integration is disabled in BRM. You can enable this feature by modifying a field in the **invoicing** instance of the **/config/business_params** object.

You modify the **/config/business_params** object by using the **pin_bus_params** utility. For information on this utility, see "pin_bus_params" in *BRM Developer's Guide*.

To enable the BRM-BI Publisher integration for invoices:

1. Go to the B*RM_Home*/**sys/data/config** directory, where *BRM_Home* is the directory in which you installed BRM components.
2. Run the following command, which creates an editable XML file from the **invoicing** instance of the **/config/business_params** object.

   ```
   pin_bus_params -r BusParamsInvoicing bus_params_Invoicing.xml
   ```

   This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. To place this file in a different directory, specify the path as part of the file name.
3. Open the **bus_params_Invoicing.xml.out** file.
4. Search for the following line:

   ```
   <EnableInvoicingIntegration>disabled</EnableInvoicingIntegration>
   ```

5. Change **disabled** to **enabled**.
6. Save the file as **bus_params_Invoicing.xml**.
7. Go to the *BRM_Home*/**sys/data/config** directory, which includes support files used by the **pin_bus_params** utility.

8. Run the following command, which loads this change into the appropriate **/config/business_params** object:

   ```
   pin_bus_params PathToWorkingDirectory/bus_params_Invoicing.xml
   ```

   where *PathToWorkingDirectory* is the directory in which **bus_params_Invoicing.xml** resides.

   > **Caution:** BRM uses the XML in this file to overwrite the existing **invoicing** instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM invoicing configuration.

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

9. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

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

10. Stop and restart the Connection Manager (CM). For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

11. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

Creating Bill Unit Validation Templates for Invoices

You specify the criteria a bill unit must meet to be associated with an invoicing configuration business profile by creating a bill unit validation template (**/config/template/billinfo**). For more information about validation templates, see "About Validation Templates" in *BRM Managing Customers*.

To create a bill unit validation template for invoices, edit the *BRM_Home*/**sys/data/config/pin_business_profile.xml** file. The file specifies the following:

- The valid business profiles for each invoice type
- The criteria a bill unit must meet to qualify for each business profile
- The templateID name.

> **Note:** Each type of invoice can have multiple business profiles, but they must all point to the same TemplateID name.

The default **pin_business_profile.xml** file includes entries for the consumer and corporate invoice documents. You can edit these entries or add entries for any other type of invoice document you want to generate.

For each type of invoice document you want to generate, edit the following entries:

- Set the **TemplateId name** entry to **InvoiceIntegration** and the **type** entry to **/billinfo**, as shown below:

```
<TemplateId name="InvoiceIntegration"  type="/billinfo">
```

- Specify the criteria a bill unit must meet to be associated with an invoicing business profile in the **Iscript** section. Enter your conditions in the **if** and **else if** blocks and the name of the business profile in PIN_FLD_NAME.

  Important: The order in which criteria is written in the **if** and **else if** blocks defines the order in which a bill unit is evaluated against the criteria.

  If a particular condition is satisfied in the **if** and **else if** blocks, the business profile name associated with the condition is set with the **OUT** label as one of the Iscript return values.

  For example:

```
<Iscript>

Long parentFlags = flistGetLong(IN,PIN_FLD_PARENT_FLAGS);

 if(parentFlags == 0)
 {
   flistSetEnum(OUT, PIN_FLD_RESULT, 1);
   flistSetStr(OUT, PIN_FLD_NAME, "ConsumerInvoice");
 }
 else if(parentFlags > 0)
 {
   flistSetEnum(OUT, PIN_FLD_RESULT, 1);
   flistSetStr(OUT, PIN_FLD_NAME, "CorporateInvoice");
 }
</Iscript>
```

Specifying the BI Publisher Report and Template

You specify the BI Publisher invoice reports and layout template names by editing the business profile configuration file (**pin_business_profile.xml**). The default XML file contains entries for generating a consumer invoice document. You can modify these entries and add entries for any other type of invoice document that you want to generate. For example, you can add entries to generate an invoice document for Internet customers or wireless telephony customers.

To specify the BI Publisher invoice report and layout template to use for generating an invoice document, edit the following entries in the *BRM_Home*/**sys**/**data**/**config**/**pin_business_profile.xml** file. Add a set of entries for each type of invoice document you want to generate:

- Specify the name of the business profile in the **BusinessProfile name** entry. The name must match the PIN_FLD_NAME entry from the Iscript element.

  Important: The **type** attribute entry for the BusinessProfile tags must be set to **Invoice**.

  For example:

```
<BusinessProfile name="ConsumerInvoice" type="Invoice">
```

- Make sure **TemplateId name** is set to **InvoiceIntegration** and the **type** is set to **/billinfo**. All invoice business profiles must use these values.

```
<TemplateId name="InvoiceIntegration" type="/billinfo"/>
```

- Specify the name of the BI Publisher XDO report to use for generating invoice documents in the **Report_Name** value entry. For example:

```
NameValue key="Report_Name" value="BRM_Consumer_Invoice_Report"
```

- Specify the name of the BI Publisher XDO report to use and the name of the layout template to use for each type of invoice, the regular invoice, the **Replacement Invoice** and the **Invoice Correction Letter**.

The following is a sample of the BusinessProfile tag entries for the default Corporate Invoice type in the **pin_business_profile.xml** file:

```
<BusinessProfile name="CorporateInvoice" type="Invoice">
  <Desc> Description of the business profile </Desc>
  <!-- List templates -->
  <TemplateId name="InvoiceIntegration" type="/billinfo" />
  <!-- List key values -->
  <NameValue key="Report_Name" value="BRM_Corporate_Invoice_Report"/>
  <NameValue key="Template_Name" value=" BRM_Corporate_Invoice"/>
  <NameValue key="Replacement_Report_Name" value="BRM_Corporate_Replacement_
Invoice_Report"/>
  <NameValue key="Replacement_Template_Name" value=" BRM_Corporate_Replacement_
Invoice"/>
  <NameValue key="Correction_Report_Name" value="BRM_Corporate_Correction_Invoice_
Report"/>
  <NameValue key="Correction_Template_Name" value=" BRM__Corporate_Correction_
Invoice"/>
</BusinessProfile>
```

Loading Invoicing Business Profiles into the Database

After editing the **pin_business_profile.xml** file, use the **load_pin_business_profile** utility to load the contents of the file into **/config/business_profile** objects in the BRM database. For more information, see "Managing Business Profiles" in *BRM Managing Customers*.

Associating Pre-Existing Bill Units with Business Profiles

All **/billinfo** objects that were created prior to your BRM-BI Publisher integration will not be linked with an **/associated_business_profile** object, which prevents you from creating BI Publisher invoices for those **/billinfo** objects. For example, this occurs if you upgraded to BRM 7.5 from a prior release.

To generate BI Publisher invoice documents for **/billinfo** objects created prior to the BRM-BI Publisher integration, you must run the **pin_upd_assoc_bus_profile** utility.

The **pin_upd_assoc_bus_profile** utility is a standalone multithreaded application (MTA) that performs the following operations:

- Searches for **/billinfo** objects in the BRM database that have an empty PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.
- Creates an **/associated_bus_profile** object for each **/billinfo** object with an empty field.

- Links the **/billinfo** object with its **/associated_bus_profile** object by populating the **/billinfo** object's PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field.

To associate pre-existing bill units with business profiles:

1. Make sure that the BRM-BI Publisher integration is enabled. See "Enabling the BRM-BI Publisher Integration".

   Note: The utility fails if you attempt to run it when the BRM-BI Publisher integration is disabled.

2. (Optional) If you want to associate only a subset of your pre-existing bill units with business profiles, create a text file that specifies the **/billinfo** objects to update. The file must use the following format:

```
0 PIN_FLD_RESULTS     ARRAY [0] allocated 20, used 1
1    PIN_FLD_POID      POID [0] 0.0.0.1 /billinfo 37395 1
0 PIN_FLD_RESULTS     ARRAY [1] allocated 20, used 1
1    PIN_FLD_POID      POID [0] 0.0.0.1 /billinfo 37488 3
```

3. Go to the *BRM_Home*/**apps/pin_billd** directory.

   Note: **pin_upd_assoc_bus_profile** requires a configuration file in the directory from which you run the utility. The configuration file requires the standard CM connection and MTA entries. See "Configuring Your Multithreaded Application" in *BRM Developer's Guide*.

4. Enter the following command:

   pin_upd_assoc_bus_profile [**-file** *filename*]

   where *filename* specifies the name and location of the file that lists the **/billinfo** objects to update.

If you run the utility without any parameters, the utility searches all **/billinfo** objects in the BRM database. If you run the utility with the **-file** parameter, the utility searches only those **/billinfo** objects specified in the file.

About the /associated_bus_profile Object

If you are using BRM-BI Publisher integration framework to generate invoice documents, at the time of customer account creation, the **/associated_bus_profile** object is created. See "Enabling the BRM-BI Publisher Integration". The **/associated_bus_profile** object stores the invoicing business profile information for a **/billinfo** object. The **/associated_bus_profile** object contains the layout template name in the PIN_FLD_TEMPLATE _NAME field and the report name in the PIN_FLD_REPORT_NAME field.

Creating /associated_bus_profile Objects

If the BRM-BI Publisher invoicing integration is enabled, during customer account creation, internally the PCM_OP_CUST_CREATE_BILLINFO opcode calls the PCM_OP_CUST_CREATE_ASSOCIATED_BUS_PROFILE opcode to create one **/associated_bus_profile** object for each bill unit in the account.

Creating /associated_bus_profile Objects for Accounts in a Branded Environment

To create **/config/business_profile** objects for accounts in a branded environment:

1. In *BRM_Home*/**sys/data/config** directory, create a new directory for the brand.

   For example, **BrandA**.

2. Copy **pin.conf**, **business_configuration.xsd**, and **pin_business_profile.xml** files from *BRM_Home*/**sys/data/config** to *BRM_Home*/**sys/data/config/BrandA**.

3. Open **pin.conf** and add the following entries:

   ```
   nap login_name brandloginname
   nap login_pw brandpassword
   ```

   where *brandloginname* is the login name for the brand and *brandpassword* is the password for the brand.

4. Save and close the file.

5. Open **pin_business_profile.xml** and replace the default values with the new values listed in Table 4–2:

Table 4–2 Default Values in pin_business_profile.xml File

Entry	Default Value	New Value
BusinessProfile name	ConsumerInvoice	ConsumerInvoice_BrandA
TemplateId name	InvoiceIntegration	InvoiceIntegration_BrandA
NameValue value	BRM_Consumer_Invoice_Report	BRM_Consumer_Invoice_Report_BrandA
NameValue value	BRM_Consumer_Invoice	BRM_Consumer_Invoice_BrandA
BusinessProfile name	CorporateInvoice	CorporateInvoice_BrandA
TemplateId name	InvoiceIntegration	InvoiceIntegration_BrandA
NameValue value	BRM_Corporate_Invoice_Report	BRM_Corporate_Invoice_Report_BrandA
NameValue value	BRM_Corporate_Invoice	BRM_Corporate_Invoice_BrandA
Template name	InvoiceIntegration	InvoiceIntegration_BrandA
flistSetStr PIN_FLD_NAME	ConsumerInvoice	ConsumerInvoice_BrandA
flistSetStr PIN_FLD_NAME	CorporateInvoice	CorporateInvoice_BrandA

6. Save and close the file.

7. Go to the *BRM_Home*/**sys/data/config/BrandA** directory and enter the following command:

   ```
   load_pin_business_profile pin_business_profile.xml
   ```

8. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

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

Creating Reports for Accounts in a Branded Environment in BI Publisher

1. In a Web browser, enter the following URL:

   http://*BI_Publisher_host*:*port***/xmlpserver/**

   where:

   - *BI_Publisher_host* is the host name on which the BI Publisher server is installed.
   - *port* is the console port. The default port is **9704**.

2. Log in to BI Publisher.
3. Create a new RTF template to associate it with the layout template specific for the accounts in a brand. See the discussion on creating an RTF template using the template builder for Word in the BI Publisher documentation.

   Note: The layout template name must be same as the template name specified in the updated **pin_business_profile.xml** file. For example, if you specify the layout template as **BRM_Consumer_Invoice_BrandA**, you must name the RTF template file as **BRM_Consumer_Invoice_BrandA.rtf**.

4. In **Shared Folders**, click **BRM_Invoices**.
5. Click **Create a new report** link.
6. Enter the report name as **BRM_Consumer_Invoice_Report_BrandA**.

   Note: The report name must be same as the report name specified in the updated **pin_business_profile.xml** file.

7. For the **BRM_Consumer_Invoice_Report_BrandA** report, click **Edit**. To specify report properties, see the discussion on creating the report entry and specify general properties in the BI Publisher documentation.

   Note:

   - The configuration of **BRM_Consumer_Invoice_Report_BrandA** report must be same as the sample **BRM_Consumer_Invoice_Report** report in the BRM-BI Publisher invoicing integration package. For example, the **BRM_Consumer_Invoice_Report_BrandA report** must have the same WSDL URL as given in the **BRM_Consumer_Invoice_Report** report.
   - The layout template name must be **BRM_Consumer_Invoice_BrandA**.

8. Click **Save**.

Installing BRM-BI Publisher Invoicing Integration Package

This section describes how to install the BRM-BI Publisher invoicing integration package. This package is set up on the BI Publisher server.

Windows Installation

To install the BRM-BI Publisher invoicing integration package:

- Follow the pre-installation requirements. See "Pre-Installation Requirements".
- Set the BI Publisher environment variables. See "Setting the BI Publisher System Environment Variable".
- Run the BRM-BI Publisher invoicing integration package. See "Installing the BRM-BI Publisher Invoicing Integration Package Application".
- Set the LD_LIBRARY_PATH environment variable. See "Setting the LD_LIBRARY_PATH Environment Variable".

Pre-Installation Requirements

Before running the BRM-BI Publisher invoicing integration package application, do the following:

- Install Java 1.5 (or higher version).
- Set the BIP_HOME and JAVA_HOME environment variables. See "Setting the BI Publisher System Environment Variable".

Note: After you install BI Publisher on your machine, the BIP_HOME environment variable is created. If the BIP_HOME environment variable is not set, the BRM-BIP invoicing integration package application will quit.

Setting the BI Publisher System Environment Variable

To set the BI Publisher home environment variable:

1. On the desktop, right-click **My Computer**, and select **Properties** from the shortcut menu.
2. Click the **Advanced** tab.
3. Click **Environment Variable**.
4. In **System variables**, click **New**.
5. In the **Variable name** field, enter **BIP_HOME**.
6. In the **Variable value** field, enter the path where the BI Publisher server is installed.
7. Click **OK**.
8. In **Environment Variables** dialog box, click **OK**.
9. In **System Properties** dialog box, click **OK**.

Installing the BRM-BI Publisher Invoicing Integration Package Application

To install the BRM-BI Publisher invoicing integration package application:

1. Go to the directory containing the BRM-BI Publisher invoicing integration package application, **7.5.0_BRM_BIP_Invoicing_Integration_nt_32_opt.exe**.
2. Run **7.5.0_BRM_BIP_Invoicing_Integration_nt_32_opt.exe**.

   The installation wizard starts.

3. Read the instructions and enter the required details in the installation wizard screens.
4. After the installation completes, click **Finish**.

Setting the LD_LIBRARY_PATH Environment Variable

To set the LD_LIBRARY_PATH environment variable:

1. On the server on which the BRM-BI Publisher integration is deployed, set the LD_LIBRARY_PATH environment variable to **portal.dll**.
2. Go to *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**.
3. Run the following command:

```
BipEnv.bat
```

Linux Installation

To install the BRM-BI Publisher invoicing integration package:

- Ensure that the pre-installation requirements are satisfied. See "Pre-Installation Requirements".
- Run the BRM-BI Publisher invoicing integration package. See "Enabling the BRM-BI Publisher Invoicing Integration Package Application".
- Set the LD_LIBRARY_PATH environment variable. See "Setting the LD_LIBRARY_PATH Environment Variable".

Pre-Installation Requirements

The following must be completed before you run the BRM-BI Publisher invoicing integration package application:

- BI Publisher is installed on Linux.
- BI Publisher home environment variable has been successfully set.

For more information on these requirements, see *BRM Reports*.

Enabling the BRM-BI Publisher Invoicing Integration Package Application

To enable the BRM-BI Publisher invoicing integration:

1. Download the **7.5.0_BRM_BIP_Invoicing_Integration_linux_32_opt.bin** file to a temporary directory (*temp_dir*).
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.
>
> If you fail to do so, “suitable JVM not found” and other error messages appear.

For Bash shell:

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

For C shell:

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

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

```
7.5.0_BRM_BIP_Invoicing_Integration_linux_32_opt.bin -console
```

Setting the LD_LIBRARY_PATH Environment Variable

To set the LD_LIBRARY_PATH environment variable:

1. On the server on which the BRM-BI Publisher integration is deployed, set the LD_LIBRARY_PATH environment variable in your shell startup script (for example, in **.cshrc**) to the directory that has the **libportal.so** shared library.
2. Go to *BIP_Home*/**oc4j_bi/j2ee/home/applications/pin_inv_doc_gen**.
3. Run the following command:

```
./BipEnv.sh
```

Installed Files

The BRM-BI Publisher invoicing integration program copies the following files listed in Table 4–3 to your computer during installation:

Table 4–3 BI Publisher Related Files Placed on Your Computer

Filename	Install Path	Description
BipEnv.bat	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	Batch script for setting environment variables. Before running the BipEnv.bat file, ensure that JAVA_HOME environment variable is set.
BIPExtension.jar	*BIP_Home***oc4j_bi\j2ee\home\applications\xmlpserver\xmlpserver\WEB-INF\lib**	JAR file used by RTF file for date conversions.
BRM_Consumer_Correction_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Correction_Invoice_Report**	RTF file associated with layout template for consumer corrective invoice letter document.
BRM_Consumer_Correction_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Correction_Invoice_Report**	XDO file for consumer corrective invoice letter document.
BRM_Consumer_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Invoice_Report**	RTF file associated with layout template for consumer invoice document.
BRM_Consumer_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Invoice_Report**	XDO file for consumer invoice document.
BRM_Consumer_Replacement_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Replacement_Invoice_Report**	RTF file associated with layout template for consumer replacement invoice document.

Table 4–3 (Cont.) BI Publisher Related Files Placed on Your Computer

Filename	Install Path	Description
BRM_Consumer_Replacement_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Consumer_Replacement_Invoice_Report**	XDO file for consumer replacement invoice document.
BRM_Corporate_Correction_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Correction_Invoice_Report**	RTF file associated with layout template for corporate corrective invoice letter document.
BRM_Corporate_Correction_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Correction_Invoice_Report**	XDO file for corporate corrective invoice letter document.
BRM_Corporate_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Invoice_Report**	RTF file associated with layout template for corporate invoice.
BRM_Corporate_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Invoice_Report**	XDO file for corporate invoice document.
BRM_Corporate_Replacement_Invoice.rtf	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Replacement_Invoice_Report**	RTF file associated with layout template for corporate replacement invoice document.
BRM_Corporate_Replacement_Invoice_Report.xdo	*BIP_Home***xmlp\XMLP\Reports\BRM_Invoices\BRM_Corporate_Replacement_Invoice_Report**	XDO file for corporate replacement invoice document.
Create_Xmlp_Invoice_Job.sql	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	Script for creating **XMLP_INVOICE_JOB** table in BI Publisher Scheduler database.
Infranet.properties	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	**Infranet.properties** file for **pin_inv_doc_gen.jar**. Contains the configuration entries for the **pin_inv_doc_gen** utility.
InvoiceList.xml	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	XML file containing the details of accounts and bill units. The **InvoiceList.xml** file is passed along with **–accts_list** as an input parameter to **pin_inv_doc_gen.**

Table 4–3 (Cont.) BI Publisher Related Files Placed on Your Computer

Filename	Install Path	Description
InvoiceList.xsd	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	XSD file that validates the InvoiceList.xml.
pin_inv_doc_gen.jar	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**	JAR file for **pin_inv_doc_gen** application.
PublicBRMfetchInvoiceXMLService.war	*BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen\WS-fetchInvoiceXML**	Application WAR file for the custom BRM Web service to be deployed on to the OC4J application server.

Configuring the pin_inv_doc_gen Utility

Configuring **pin_inv_doc_gen** involves:

- Configuring the Infranet.properties File for pin_inv_doc_gen
- Configuring the BipEnv.bat File
- Changing Command-Line Parameters for pin_inv_doc_gen
- Setting Scheduler Configuration
- Configuring the Email Server
- Creating the XMLP_INVOICE_JOB Table in the Scheduler Database

Configuring the Infranet.properties File for pin_inv_doc_gen

To configure the **Infranet.properties** file for **pin_inv_doc_gen**:

1. Go to *BIP_Home*/**oc4j_bi/j2ee/home/applications/pin_inv_doc_gen**.
2. Open the **Infranet.properties** file in a text editor and provide the required values for configuring **pin_inv_doc_gen**.

   The **Infranet.properties** file for the **pin_inv_doc_gen** utility includes the standard configuration entries. See "Using Configuration Files to Connect and Configure Components" in *BRM System Administrator's Guide*.

   Note: The user must have read-write permissions to access the **/invoice** object. The BRM system administrator creates this user and grants the required permissions.

   Table 4–4 shows the entries for this utility in the **Infranet.properties** file.

Table 4–4 Infranet.properties File Entries

Entry	Description
infranet.bip.deliveryoption1	Specifies the first delivery option for the invoice document. See *Setting Up Delivery Options* in your BI Publisher documentation.
infranet.bip.deliveryoption2	Specifies the second delivery option for the invoice document.
infranet.bip.emailfromaddress	Specifies the email address of the sender who sends the Scheduler delivery request.

Table 4–4 (Cont.) Infranet.properties File Entries

Entry	Description
infranet.bip.ftpremotedirectory	Specifies the ftp remote directory for ftp delivery option.
infranet.bip.ftpsecureftp	Valid entries are: ■ **false**. (Default) ■ **true**.
infranet.bip.ftpservername	Specifies the ftp server name for ftp delivery option.
infranet.bip.ftpusername	Specifies the ftp user name for ftp delivery option.
infranet.bip.ftpuserpassword	Specifies the ftp user password for ftp delivery option.
infranet.bip.outputdocformat	Specifies the output format of the invoice document: PDF or HTML. See "Specifying the Utility Output Format".
infranet.bip.password	Specifies the password. **Note:** BI Publisher does not encrypt or decrypt the password. Ensure that the password to connect to the BI Publisher server is valid.
infranet.bip.port	Specifies the BI Publisher port number.
infranet.bip.server	Specifies the name of the BI Publisher server.
infranet.bip.toemailaddress	Specifies the receiver's email address who receives the Scheduler delivery request. It also specifies the receiver's email address who receives the invoice document as an email attachment.
infranet.bip.username	Specifies the username.
infranet.log.file	Specifies the log file name for the PublicBRMfetchInvoiceXMLService Web service.
infranet.log.level	Specifies the level of log for the PublicBRMfetchInvoiceXMLService Web service.
infranet.dmsearchargs.size	Specifies the number of account and bill unit pairs the utility should process at one time. The maximum value is **14**.
infranet.dupinvdir.path	Specifies the directory path for storing duplicate invoice documents.
infranet.threadpool.fetchsize	Specifies the number of records that can be fetched by the thread. The default value is **5**.
infranet.threadpool.maxsize	Specifies the maximum number of threads. The default value is **5**.
infranet.threadpool.size	Specifies the number of threads. The default value is **3**.

3. Save and close the file.

Specifying the Utility Output Format

You can generate the invoice document in PDF, HTML, and XML (data) formats.

To specify the output format for the invoice document:

1. Open the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen\Infranet.properties** file in a text editor.
2. Set the **infranet.bip.outputdocformat** parameter to: PDF or HTML.

```
infranet.bip.outputdocformat=PDF
```

3. Save and close the file.

After generating an invoice document, if you want to change the output format, you need to update the **Infranet.properties** file for **pin_inv_doc_gen** with the desired format and regenerate the invoice document.

Configuring the BipEnv.bat File

To configure the **BipEnv.bat** file:

1. Go to *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**.
2. Open the **BipEnv.bat** file.
3. Edit the default values available in the file to the values specific to your system environment.
4. Save and close the file.

Changing Command-Line Parameters for pin_inv_doc_gen

To change the command-line parameters for **pin_inv_doc_gen** utility, you update the **BipEnv.bat** file:

1. Go to *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**.
2. Open the **BipEnv.bat** file in a text editor.
3. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

4. Add or replace the **pin_inv_doc_gen** command-line parameter with the required parameter. For syntax and parameter usage, see "pin_inv_doc_gen".
5. Save and close the file.
6. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
7. Enter the following command which runs the **BipEnv.bat** file:

   ```
   BipEnv.bat
   ```

   The **pin_inv_doc_gen** utility runs with the updated command-line parameter.

Setting Scheduler Configuration

To set Scheduler configuration, see the discussion on setting scheduler configuration options in the BI Publisher documentation.

Configuring the Email Server

To configure the email server in BI Publisher, see the discussion of setting up delivery options in the BI Publisher documentation.

Creating the XMLP_INVOICE_JOB Table in the Scheduler Database

The XMLP_INVOICE_JOB table stores the mapping of job ID and the Invoice_POID for which an invoice document is generated.

To create XMLP_INVOICE_JOB table in the Scheduler database:

1. Go to *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**.

2. Open **Create_Xmlp_Invoice_Job.sql** file.
3. Search for **<tablespacename>**.
4. Replace **<tablespacename>** with the tablespace name where all the BI Publisher Scheduler tables in the BI Publisher Scheduler database are created.
5. Save and close the file.
6. At the DOS command prompt, go to:

   *BIP_Home***\oc4j_bi\j2ee\home\applications\pin_inv_doc_gen**.
7. At the prompt, enter the following command to open SQL*Plus:

   ```
   sqlplus user_name/password@Database_Name
   ```

   where

   - *user_name* is the user name for the Scheduler database.
   - *password* is the password for the Scheduler database.
   - *Database_Name* is the SID of the Scheduler database.
8. At the SQL prompt of the Scheduler database connection, enter the following command:

   ```
   SQL> @Create_Xmlp_Invoice_Job.sql
   ```

Deploying the BRM Web Service

Important: If the invoice data is stored in pin_flist format instead of XML format, before deploying the BRM Web service, you must create a shared library in the OC4J server to overcome the issue of **xmlparserv2.jar** of OC4J server. See "Creating Shared Library in OC4J Server".

To deploy the BRM Web service, PublicBRMfetchInvoiceXMLService:

1. In a Web browser, enter the following URL to log in to the Oracle Enterprise Manager Application Server Control console:

   ```
   http://localhost:port/em
   ```

   where:

   - *localhost* is the host on which Application Sever Control is installed.
   - *port* is the console port. The default port is **9704**.
2. Click the **Applications** link.
3. Click **Deploy**.
4. In the **Deploy: Select Archive** page, click **Browse** to select the **PublicBRMfetchInvoiceXMLService.war** file.

Note: After you install the BRM-BIP invoicing integration package application, the **PublicBRMfetchInvoiceXMLService.war** file is located at *BIP_Home***\oc4j_bi\j2ee\home\applications\pin_inv_doc_gen\WS-fetchInvoiceXML** directory.

---

5. Click **Next**.
6. In the **Deploy: Application Attributes** page, in the **Application Name** field, enter **PublicBRMfetchInvoiceXMLService**.

   Note: You must name the Web service as **PublicBRMfetchInvoiceXMLService**.

7. Click **Next**.

   Important: If the invoice data is stored in pin_flist format, you must perform the additional steps from 8 through 12. If the invoice data is stored in XML format, skip the additional steps from 8 through 12 and start from Step 13.

8. In the **Deploy: Deployment Settings** page, click the **Go to Task** icon for **Configure Class Loading**.

   The shared libraries currently defined in the server display.
9. Select the **Import** check box for the shared library that you created. See "Creating Shared Library in OC4J Server".
10. Click **Next 10**.
11. Clear the **Import** check box for **oracle.xml** shared library.

    Note: The **oracle.xml** shared library may appear on another page. If you do not see it, keep clicking the **Next 10** link until you find it.

12. Click **OK** at the top of the page.
13. Click **Deploy**.

    The confirmation of successful deployment of the application appears.
14. Click **Return**.
15. Edit the **Infranet.properties** file to define your configuration entries.

    Note: After deploying the **PublicBRMfetchInvoiceXMLService.war** file, the **Infranet.properties** file is located at *BIP_Home***oc4j_bi\j2ee\home\applications\PublicBRMfetchInvoiceXMLService\PublicBRMfetchInvoiceXMLService\WEB-INF\classes** directory.

16. Restart your BI Publisher server.

    After deploying the Web service, you should test that the Web service is fetching the data correctly. See "Testing the Newly Deployed Web Service".

Note: The sample XDO reports that are part of the BRM-BIP invoicing integration package have the default BRM Web service URL defined as:

http://localhost:9704/PublicBRMfetchInvoiceXMLService/fetchInvoiceXMLPort?WSDL.

Replace the default URL with the URL that you get after deploying the Web service.

Creating Shared Library in OC4J Server

To create a shared library:

1. In a Web browser, enter the following URL to log in to the Oracle Enterprise Manager Application Server Control console:

   http://*localhost*:*port***/em**

   where:

   - *localhost* is the host on which Application Sever Control is installed.
   - *port* is the console port. The default port is **9704**.
2. Click the **Administration** link.
3. Click the **Go to Task** icon for **Shared Libraries**.
4. In the **Shared Libraries** page, click the **Create** button.
5. In the **Create Shared Library: Attributes** page, do the following:
   a. In the **Shared Library Name** field, enter **apachexerces.xml**.
   b. In the **Shared Library Version** field, enter **1.0**.
   c. Click **Next**.
6. In the **Create Shared Library: Add Archives** page, click the **Add** button.
7. Select the first option and browse for the **xercesImpl.jar** file.

   This file is located at: *BIP_Home***\oc4j_bi\ant\lib\xercesImpl.jar**.
8. Click **Continue**.
9. Click **Next**.
10. Click **Finish**.

    The **Shared Libraries** page displays the newly added shared library.

Testing the Newly Deployed Web Service

1. In the Oracle Enterprise Manager Application Server Control console, click the **Application** link to access the newly deployed Web service.
2. Click the **PublicBRMfetchInvoiceXMLService** link.
3. Click the **Web Services** link and click **fetchInvoiceXMLPort**.
4. Click the **Test Service** link.
5. In the **Discovered Websites** page, click **Test Web Service**.

6. In the **Invoice_POID** field, enter an invoice POID for which you want to fetch the invoice data from the BRM database.
7. Click **Invoke**.

   If the Web service is working correctly, you should be able to view the fetched invoice data in XML format.

Configuring How PublicBRMfetchInvoiceXMLService Connects to the BRM Database

The **Infranet.properties** file for the **pin_inv_doc_gen** utility includes the standard configuration entries. See "Using Configuration Files to Connect and Configure Components" in *BRM System Administrator's Guide*.

After you deploy the PublicBRMfetchInvoiceXMLService Web service, you can configure how it connects to the BRM database by using the Web service's **Infranet.properties** file.

You can access the **Infranet.properties** file from the *BIP_Home***oc4j_bi\j2ee\home\applications\PublicBRMfetchInvoiceXMLService\PublicBRMfetchInvoiceXMLService\WEB-INF\classes** directory. See "Deploying the BRM Web Service".

Table 4–4 lists the entries in the **Infranet.properties** file. Open the **Infranet.properties** file and enter the following required entries:

- **infranet.db.username**
- **infranet.db.sid**
- **infranet.db.log.file**
- **infranet.db.log.level**

Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems

To configure the BRM-BI Publisher invoicing integration to support multischema systems, do the following:

- Configure the connection pool and the data source for BRM schemas. See "Configuring the Connection Pool and the Data Source".
- Configure the connection pool and the data source for the BI Publisher Scheduler database. See "Configuring the Connection Pool and the Data Source".
- Add Java Naming and Directory Interface (JNDI) entries for your BI Publisher administration server. See "Adding JNDI Entries in the Infranet.properties File of pin_inv_doc_gen".

Configuring the Connection Pool and the Data Source

To configure the connection pool and the data source for the BRM schema or the BI Publisher Scheduler database:

1. In a Web browser, enter the following URL to log in to the Oracle Enterprise Manager Application Server Control console:

   http://*localhost*:*port***/em**

where:

- *localhost* is the host on which Application Sever Control is installed.
- *port* is the console port. The default port is **9704**.

2. Click the **Administration** link.
3. Click the **Go to Task** icon for **JDBC Resources**.

   The **JDBC Resources** page appears.
4. In the **Connection Pools** section, click the **Create** button.

   The **Create Connection Pool - Application** page opens.
5. Do the following:
   a. From the **Application** list, select **default**.
   b. From the **Connection Pool Type** section, select the **New Connection Pool** option.
   c. Click **Continue**.

      The **Create Connection Pool** page opens.
6. Do the following:
   a. In the **Name** field, enter the name of the connection pool.
      – For the BRM schema, enter the BRM schema name. For example, enter **0.0.0.1.**
      – For the BI Publisher Scheduler database, enter **scheduler**.
   b. In the **Connection Factory Class** field, enter **oracle.jdbc.pool.OracleDataSource**.
   c. In the **JDBC URL** field, enter the connection string.
      – For the BRM schema, enter the connection string to the BRM schema.
      – For the BI Publisher Scheduler database, enter the connection string to the BI Publisher Scheduler database.
   d. (Optional) To verify the connectivity to the BRM schema or to the BI Publisher Scheduler database, click **Test Connection**.
   e. Click **Finish**.

      In the **JDBC Resources** page, the **Connection Pools** section displays the newly added connection pool.
7. (Optional for BRM schemas) In a multischema BRM system, to create connection pools for different BRM schemas, such as **0.0.0.2**, **0.0.0.3**, repeat step 4 through step 6.
8. In the **Data Sources** section, click the **Create** button.

   The **Create Data Source - Application & Type** page appears.
9. Do the following:
   a. From the **Application** list, select **default**.
   b. From the **Data Source Type** section, select the **Managed Data Source** option.
   c. Click **Continue**.

      The **Create Data Source - Managed Data Source** page opens.

10. Do the following:
    a. In the **Name** field, enter the name of the BRM schema or the BI Publisher Scheduler database for which you configured the connection pool.

       For example:

       – For a BRM schema, enter **0.0.0.1**.
       – For a BI Publisher Scheduler database, enter **scheduler**.

    b. In the **JNDI Location** field, enter one of the following:

       – For a BRM schema, enter **jdbc/OracleBRM/***BRMSchema*, where *BRMSchema* is the BRM schema for which the data source is being created. For example, if the BRM schema is **0.0.0.1**, enter **jdbc/OracleBRM/0.0.0.1**.
       – For the BI Publisher Scheduler database, enter **jdbc/OracleBIP/scheduler**.

    c. Click **Finish**.

       In the **JDBC Resources** page, the **Data Sources** section displays the newly added data source.

11. (Optional for BRM schemas) In a multischema BRM system, to create data sources for connection pools belonging to different BRM schemas, such as **0.0.0.2**, **0.0.0.3**, repeat step 8 through step 10.

Adding JNDI Entries in the Infranet.properties File of pin_inv_doc_gen

To add JNDI entries for fetching data from the configured data sources:

1. Open the *BIP_Home***/oc4j_bi/j2ee/home/applications/pin_inv_doc_gen/Infranet.properties** file in a text editor.
2. Add the entries shown in Table 4–5 to the end of the file:

Table 4–5 JNDI Entries

Entry	Description
infranet.PROVIDER_URL	The environment property that specifies the BI Publisher provider URL in the following format: **ormi://***localhost***:***port***/xmlpserver** where *localhost* is the host on which the BI Publisher server is installed and *port* is the Oracle Remote Method Invocation port. The default port is **23791**.
infranet.SECURITY_PRINCIPAL	The environment property that specifies the identity of the principal for authenticating the caller to the service.
infranet.SECURITY_CREDENTIALS	The environment property that specifies the credentials of the principal for authenticating the caller to the service.
infranet.INITIAL_CONTEXT_FACTORY	The environment property that specifies the initial context factory to use. The default is **com.evermind.server.ApplicationClientInitialContextFactory**. Do not modify this value.

3. Save and close the file.

Generating BI Publisher Invoice Documents

You use the **pin_inv_doc_gen** utility to generate invoice documents by integrating the capabilities of BRM and BI Publisher. This utility takes a set of input parameters, generates the invoice document, and stores the instance of the invoice document generated in the BI Publisher Scheduler database. Based on the input parameters you pass to **pin_inv_doc_gen**, the utility fetches the corresponding invoice POID, BI Publisher report name, and layout template name of an **/invoice** object.

To configure **pin_inv_doc_gen** utility with the **Infranet.properties** file, see "Configuring the Infranet.properties File for pin_inv_doc_gen".

To run the **pin_inv_doc_gen** utility:

1. Configure the **BipEnv.bat** file to execute the appropriate **pin_inv_doc_gen** command. To view the utility's syntax and parameters, see "pin_inv_doc_gen".
2. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
3. Enter the following command which runs the **BipEnv.bat** file:

```
BipEnv.bat
```

Generating BI Publisher Invoice Documents for a List of Accounts

You can generate BI Publisher invoice documents for a list of accounts by using the **pin_inv_doc_gen** utility **-accts_list InvoiceList.xml** parameter. The number of data units (accounts and bill units) in the **InvoiceList.xml** file should be within the permissible range for the Data Manager (DM) to search the **/invoice** objects from the BRM database.

You can specify the number of account and bill unit pairs the **pin_inv_doc_gen** utility should process at one time using the **infranet.dmsearchargs.size** parameter in the **Infranet.properties** file. The maximum value is 14. For example, if the **InvoiceList.xml** file lists 20 account and bill unit pairs and the **infranet.dmsearchargs.size value** is set to 6, the **pin_inv_doc_gen** utility processes six account and bill unit pairs at a time.

In the **InvoiceList.xml** file, if you specify the account and bill unit pair of a corporate account, the invoice document is generated only for the specified account and bill unit. If the specified corporate account has subordinate accounts, the **/invoice** objects of the subordinate account are not selected for generating the invoice document.

To generate invoice documents for a list of accounts and their bill units:

1. Create an XML file that lists all of the accounts and bill units for which to create BI Publisher invoices. The XML file must be in the following format:

> **Note:** You can use the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen\InvoiceList.xml** file as an example.

```
<InvoiceDocGenConfig>
   <InvoicingList>
      <Account>101304</Account>
      <Billinfo>402678</Billinfo>
   </InvoicingList>
   <InvoicingList>
      <Account>405304</Account>
      <Billinfo>522678</Billinfo>
```

```
   </InvoicingList>
<InvoiceDocGenConfig>
```

2. Go to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
3. Open the **BipEnv.bat** file in a text editor.
4. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

5. Replace with:

   ```
   invoicedocgen.pin_inv_doc_gen -accts_list InvoiceList
   ```

   where *InvoiceList* specifies the name and location of the file that includes a list of accounts and bill units for which to create invoice documents. This is the file you created in step 1.
6. Save and close the file.
7. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
8. Enter the following command to execute the **BipEnv.bat** file:

   ```
   BipEnv.bat
   ```

Generating BI Publisher Invoice Documents Based on the Account Type

To generate invoices based on the account type:

1. Go to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
2. Open the **BipEnv.bat** file in a text editor.
3. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

4. Do one of the following:
   - To generate invoice document for consumer account types, replace with:

     ```
     invoicedocgen.pin_inv_doc_gen -type consumer
     ```

   - To generate invoice document for corporate account types, replace with:

     ```
     invoicedocgen.pin_inv_doc_gen -type corporate
     ```

5. Save and close the file.
6. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
7. Enter the following command to execute the **BipEnv.bat** file:

   ```
   BipEnv.bat
   ```

Generating Duplicate BI Publisher Invoice Documents

You can generate duplicate BI Publisher invoice documents for invoices that you have already generated by using the **pin_inv_doc_gen** utility **-status generated** parameter.

To generate duplicate BI Publisher invoice documents:

1. Go to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
2. Make sure the **infranet.dupinvdir.path** entry in the utility's **Infranet.properties** file specifies the directory in which to write the file. See "Configuring the Infranet.properties File for pin_inv_doc_gen".
3. Open the **BipEnv.bat** file in a text editor.
4. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

5. Replace with:

   ```
   invoicedocgen.pin_inv_doc_gen -status generated
   ```

6. Save and close the file.
7. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
8. Enter the following command to execute the **BipEnv.bat** file:

   ```
   BipEnv.bat
   ```

> **Important:** Oracle recommends **DocMerger** as the utility to generate a duplicate invoice with a DUPLICATE watermark. However, you can use this utility only for PDF documents. Hence, you can generate an invoice document with a DUPLICATE watermark only if the original invoice document was generated in PDF.

Regenerating BI Publisher Invoice Documents

If an **/invoice** object changes after you created a BI Publisher invoice document, you can generate a new BI Publisher invoice document by using the **pin_inv_doc_gen** utility **-status regen** parameter.

To regenerate BI Publisher invoice documents:

1. Go to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
2. Open the **BipEnv.bat** file in a text editor.
3. Search for the following line:

   ```
   invoicedocgen.pin_inv_doc_gen -status pending
   ```

4. Replace with:

   ```
   invoicedocgen.pin_inv_doc_gen -status regen
   ```

5. Save and close the file.
6. In the command prompt, navigate to the *BIP_Home***oc4j_bi\j2ee\home\applications\pin_inv_doc_gen** directory.
7. Enter the following command to execute the **BipEnv.bat** file:

   ```
   BipEnv.bat
   ```

The utility generates a BI Publisher invoice document for all **/invoice** objects in the BRM database that have a status of PIN_INV_STATUS_GENERATED.

Storing the Invoice Document

You can store invoice documents in the BI Publisher Scheduler database. Oracle recommends configuring a separate database, other than the BRM database, to store invoice documents. See "Setting Scheduler Configuration".

Sending Invoice Documents to the Customers

After generating the invoice document, you can email it to the customers. To send the invoice document through email, you must:

- Configure the Scheduler database in BI Publisher. See "Setting Scheduler Configuration".
- Configure the Email server in BI Publisher. See "Configuring the Email Server".
- Configure the invoice document delivery option in the **Infranet.properties** file of **pin_inv_doc_gen** utility. Email is configured as the default delivery option. See "Configuring the Infranet.properties File for pin_inv_doc_gen".

Customizing Invoices

Important: To customize the invoice layout, you should have template-designing experience. See the BI Publisher documentation for instructions on how to create and design layout templates.

You can customize the invoice documents by:

- Customizing Invoice Layout Templates
- Enriching Invoice Data

Customizing Invoice Layout Templates

You can customize the invoice layout template by:

- Updating the existing layout template file
- Adding a new layout template file

Updating the Invoice Layout Template File

You can update the existing layout template file by using BI Publisher Desktop (Template Builder) and Microsoft Word. For more information about updating the layout template in RTF, see the discussion of creating an RTF template in the BI Publisher documentation.

Adding a New Invoice Layout Template

To add a new layout template:

1. Create a new layout template in BI Publisher. For information on how to create a layout template, see the discussion on creating an RTF template in the BI Publisher documentation.

2. Create a new invoicing **/config/business_profile** object in BRM to reflect the addition of the new layout template. See "Specifying BI Publisher Invoice Report and Template Names in BRM" and "About Associating Bill Units with a BI Publisher Invoice and Report".

Enriching Invoice Data

After receiving invoice data from the BRM database, you might want to enrich the invoice data with marketing messages, customer information available in a customer relationship management (CRM) application, and special messages from the accounting department. BI Publisher provides this functionality by retrieving data from additional data sources.

> **Important:** The sample layout templates that are available with BRM-BIP invoicing integration package display data fetched from only the BRM database. If you want to enrich your invoice document with additional data sources, you need to customize the sample layout templates. See "Customizing Invoice Layout Templates".

To enrich BRM invoice data:

- The **/invoice** objects containing data in XML format should be present in the BRM database.
- The additional data source must be configured in BI Publisher to enrich the invoice data. See the discussion of setting up data sources in the BI Publisher documentation.
- BI Publisher reports should be configured with at least two data sources: Custom BRM Web service, PublicBRMfetchInvoiceXMLService, for retrieving invoice XML data from the BRM database, and the enriching data source. For information on data sources that BI Publisher supports, see the BI Publisher documentation.

  For detailed instructions on creating or updating BI Publisher reports based on multiple data sources, see the discussion of creating BI Publisher reports based on various data sources in the BI Publisher documentation.

Example: Enriching Invoice Data

You can enrich the BRM invoice data with additional data from various data sources. In this example, you configure the consumer invoice report to display data from a file data source in addition to the data from BRM Web service. You use the XML demo file provided along with BI Publisher (*BIP_Home***/xmlp/XMLP/DemoFiles** directory).

You must customize the **BRM_Consumer_Invoice.rtf** file to display data from additional source. See "Customizing Invoice Layout Templates".

To configure file data source in **BRM_Consumer_Invoice_Report.xdo** report:

1. In a Web browser, enter the following URL to log in to the Oracle Enterprise Manager Application Server Control console:

   http://*localhost*:*port***/em**

   where:

   - *localhost* is the host on which Application Sever Control is installed.
   - *port* is the console port. The default port is **9704**.

2. Log in to BI Publisher.
3. In **Shared Folders**, click **BRM_Invoices**.
4. For **BRM_Consumer_Invoice_Report**, click the **Edit** link.
5. In the **Report** pane, in Data Model, click **BRM_Consumer_Invoice_Report** data set.

   The **Data Set** pane displays data set name as **BRM_Consumer_Invoice_Report** and type as **Web Service**.
6. In Layouts, click **BRM_Consumer_Invoice_Report** layout.

   The **Layout** pane displays template as **BRM_Consumer_Invoice.rtf** and template type as **RTF Template**.
7. Click **Data Model**.
8. Click **New**.

   The **Data Model** displays the newly added data set, **New DataSet2**.
9. In the **Data Set** pane, perform the following:
   a. In the **Name** field, enter a name for the new data set.
   b. From the **Type** list, select **File** option.
   c. From the **Data Source** list, select **demo files**.
   d. In the **File Name** field, enter the file name that you want to use to enrich the invoice data.
10. Click **Layouts** to associate the updated layout template file with the report.
11. Click **Browse** to browse the customized **BRM_Consumer_Invoice.rtf** file.
12. Click **Upload**.
13. Click **Save**.
14. Click **View** to open the report in View mode.
15. Select the **BRM_Consumer_Invoice** template from the **Template** list and select the output format as **pdf**.
16. Click **View** to view the report.

Note: You can follow the similar steps to configure additional data sources to the existing invoicing consumer or corporate reports.

Specifying the Default Format in Which to Store Invoices in BRM

By default, BRM stores invoices in XML format. You can configure BRM to store invoices in flist format by modifying a field in the **invoicing** instance of the **/config/business_params** object.

You modify the **/config/business_params** object by using the **pin_bus_params** utility. For information on this utility, see "pin_bus_params" in *BRM Developer's Guide*.

To specify the default format in which to store invoices:

1. Go to the *BRM_Home***/sys/data/config** directory.
2. Run the following command, which creates an editable XML file from the **invoicing** instance of the **/config/business_params** object:

```
pin_bus_params -r BusParamsInvoicing -bus_params_Invoicing.xml
```

This command creates the XML file named **bus_params_Invoicing.xml.out** in your working directory. To place this file in a different directory, specify the path as part of the file name.

3. Open the **bus_params_Invoicing.xml.out** file.
4. Search for following line:

```
<InvoiceStorageType>1</InvoiceStorageType>
```

5. Do one of the following:
   - To specify flist as the output format, set **InvoiceStorageType** to **0**.
   - To specify XML as the output format, set **InvoiceStorageType** to **1**.
6. Save this file as **bus_params_Invoicing.xml**.
7. Go to the *BRM_Home*/**sys/data/config** directory, which includes support files used by the **pin_bus_params** utility.
8. Run the following command, which loads this change into the appropriate **/config/business_params** object:

```
pin_bus_params PathToWorkingDirectory/bus_params_Invoicing.xml
```

where *PathToWorkingDirectory* is the directory in which **bus_params_Invoicing.xml** resides.

Caution: BRM uses the XML in this file to overwrite the existing **invoicing** instance of the **/config/business_params** object. If you delete or modify any other parameters in the file, these changes affect the associated aspects of the BRM invoicing configuration.

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

9. Read the object with the **testnap** utility or Object Browser to verify that all fields are correct.

   See "Using testnap" in *BRM Developer's Guide* for general instructions on using the **testnap** utility. See "Reading Objects by Using Object Browser" in *BRM Developer's Guide* for information on how to use Object Browser.
10. Stop and restart the CM. For more information, see "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.
11. (Multischema systems only) Run the **pin_multidb** script with the **-R CONFIG** parameter. For more information, see "pin_multidb" in *BRM System Administrator's Guide*.

5

Examples of Invoices

This chapter contains examples of invoices to illustrate the corrective invoicing feature in Oracle Communications Billing and Revenue Management (BRM).

Note: The invoices on the following pages reflect example scenarios. Your invoices will reflect the data associated with your billing setup.

Invoice Correction Letter in Summary Format

This section shows the contents of a regular bill and, following a correction on that bill, the example summary invoice correction letter associated with corrections made to the regular bill.

Regular Invoice

Figure 5–1 shows the example regular invoice containing details of a regular bill. The first page of the regular invoice displays the information on the account owner, the billing date, the account number, the corrective bill number, the date when any payment is due on this bill.

Below this, the regular invoice shows the past due amount, charges, payments, adjustments, other charges and credits and the amount due for the billing period. The Summary of Current Charges charges section lists the details of the charges by type, taxes and surcharges, and the total current charges for this billing period.

The payment slip and related information for the customer are located at the bottom of this page.

Figure 5–1 Regular Invoice (page 1)

ORACLE

Thejas` P	Bill Date	02/01/2012
#423 K-street	Account Number	0.0.0.1-362216
Bangalore	Bill Number	B1-14
KAR 577101	Due Date	03/02/2012

Bill Period: 01/01/2012 To 02/01/2012

Past Due ($)	Current Charges ($)	Payments ($)	Adjustments ($)	Other Charges and Credits ($)	Amount Due ($)
0.00	22.00	0.00	0.00	0.00	22.00

Summary of Current Charges	Amount ($)
Service: IP	20.00
Taxes & Surcharges	2.00
Total Current Charges	22.00

Pay on the web	Questions
My Account at www.oracle.com	1.800.555.7645

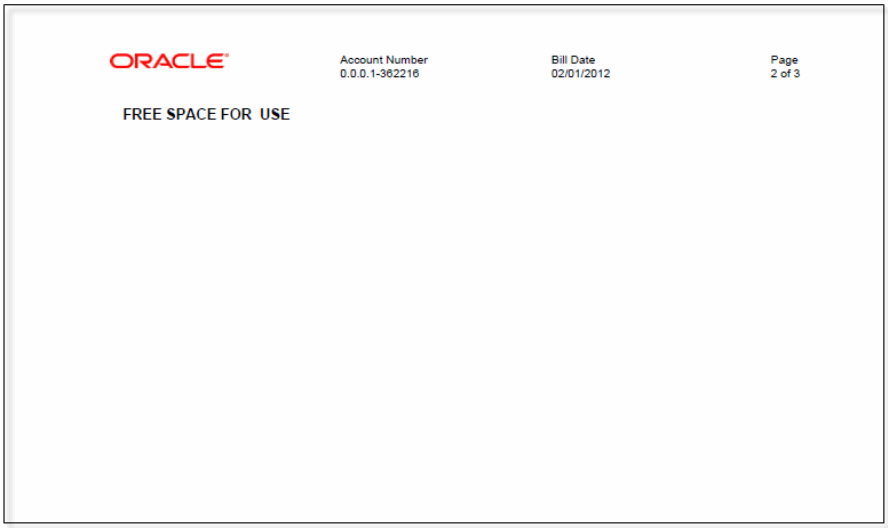
Your Payment Slip (Please include this payment slip along with your payment)

Thejas` P #423 K-street Bangalore KAR 577101	Bill Date	02/01/2012
	Account Number	0.0.0.1-362216
	Bill Number	B1-14
	Total Due by 03/02/2012	22.00 ($)
	Amount Enclosed:	

Please Mail Cheque Payable To:
Oracle Corporation
P.O. Box 123456
Redwood Shores, USA

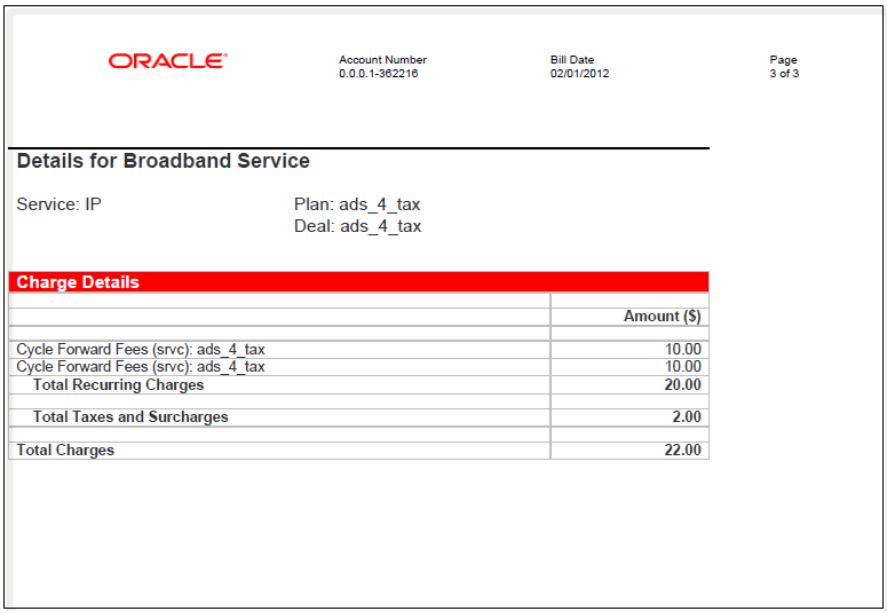
Figure 5–2 shows the second page of the regular invoice. It is intentionally left blank. The account number and billing date associated with the invoice are listed at the top of this page.

Figure 5–2 Regular Invoice (page 2)



The last page of the regular invoice (Figure 5–3) contains the details of the charges associated with the bill, the total of the recurring charges, the total of taxes and surcharges, and the total charges for the bill.

Figure 5–3 Regular Invoice (page 3)



Invoice Correction Letter

The regular bill is corrected on 02/01/2012 and a corrective invoice generated for the corrective bill. Figure 5–4 shows the example corrective invoice in the form of a summary invoice correction letter.

Figure 5–4 Invoice Correction Letter (Page 1 of Summary Format)

ORACLE

Thejas` P	Bill Date	02/15/2012
#423 K-street	Account Number	0.0.0.1-362216
Bangalore	Bill Number	CB1-10
KAR 577101	Due Date	03/16/2012
	Previous Bill Number	B1-14
	Previous Bill Date	02/01/2012

Date: 02/15/2012
Subject: Invoice Correction Letter

Dear Mr. Thejas` P,

With this letter, we confirm that the following corrections have been made to your bill for the bill period of 01/01/2012 to 02/01/2012. The following table lists the summary of corrections for this bill. Following these correction(s), the amount due now is 0.00 ($).

Summary of Corrections		
Previous Amount ($)	Corrections Amount($)	Amount($)
22.00	(22.00)	0.00

Further details of the corrections are in subsequent pages.

Please use the included payment slip to settle the amount by the due date indicated above. Thank you.

Sincerely,
Oracle Corporation

Pay on the web	Questions
My Account at www.oracle.com	1.800.555.7645

Your Payment Slip (Please include this payment slip along with your payment)

Thejas` P #423 K-street Bangalore KAR 577101	Bill Date	02/01/2012
	Account Number	0.0.0.1-362216
	Bill Number	CB1-10
	Total Due by 03/16/2012	0.00 ($)
	Amount Enclosed:	

Please Mail Cheque Payable To:
Oracle Corporation
P.O. Box 123456
Redwood Shores, USA

The first page of the invoice correction letter displays the correction details in the form of a letter.

At the top of this page you see the information on the account owner, the date when the corrective bill was generated, the account number, the corrective bill number, the date when any payment is due on the corrective bill. Below this information, invoice correction letter lists the number of the bill that was corrected (the regular bill in the example) and the billing date for that bill. The body of the letter contains the summary of the corrections associated with this corrective invoice. The payment slip and related information for the customer are located at the bottom of this page.

Figure 5–5 shows the second page of the invoice correction letter. It is intentionally left blank. The account number and billing date associated with the invoice are listed at the top of this page.

Figure 5–5 Invoice Correction Letter (Page 2 of Summary Format)

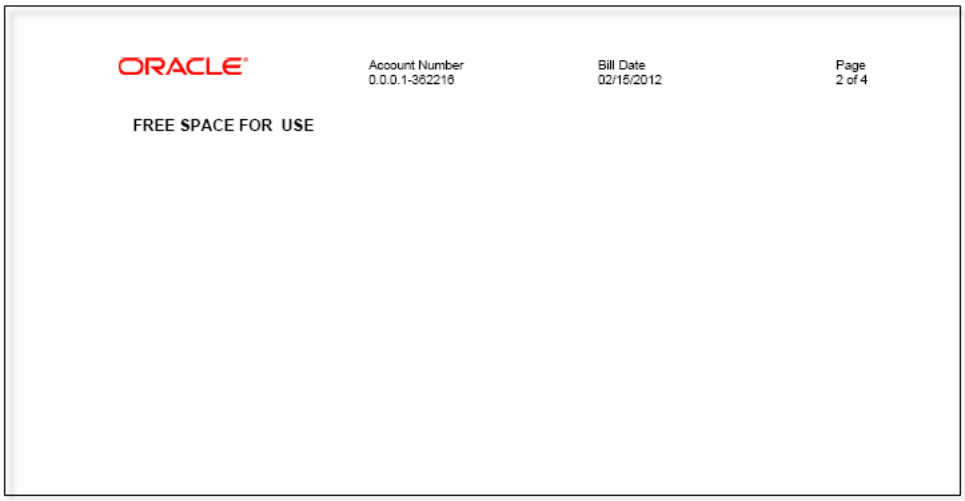
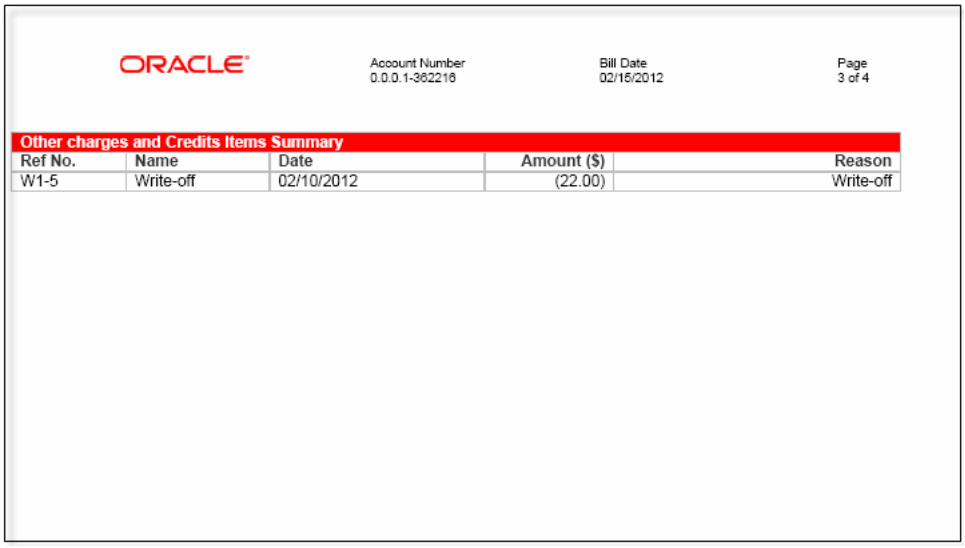


Figure 5–6 shows the third section of an invoice correction letter. It contains the summary of the other charges and credit items associated with the corrective bill. The account number and billing date associated with the invoice are listed at the top of this page.

For each entry, it lists the reference number for the charge/credit correction, a description of the entry, the date the charge/credit correction was made, the amount, and the reason for the action taken (in this example, Write-off).

Figure 5–6 Invoice Correction Letter (Page 3 of Summary Format)



Other charges and Credits Items Summary

Ref No.	Name	Date	Amount ($)	Reason
W1-5	Write-off	02/10/2012	(22.00)	Write-off

Figure 5–7 shows the final page of the example invoice correction letter.

Figure 5–7 Invoice Correction Letter (Page 4 of Summary Format)

ORACLE

Account Number
0.0.0.1-362216

Bill Date
02/15/2012

Page
4 of 4

Service: IP

Plan: ads_4_tax
Deal: ads_4_tax

Charge Correction Summary

	Previous Amount ($)	Corrections Amount ($)	Amount ($)
Recurring Charges	22.00	(22.00)	0.00
Service: ip	22.00	(22.00)	0.00
Total Charges ($)	22.00	(22.00)	0.00

The last page of the summary invoice correction letter contains the summary of the charge corrections associated with the corrective bill grouped by the service type. The entries show the previous amount, the correction amount, and the resulting amount due for the item. The recurring charges are broken down by service types. (Only one service type **ip** is shown for the above example.) The final entry shows the total charges for this corrective invoice.

Replacement Invoice in Detail Format

This section shows the summary replacement invoice associated with corrections made to a regular bill.

Regular Invoice

Figure 5–8 shows the example regular invoice containing details of the regular bill. Its format is described in "Invoice Correction Letter in Summary Format".

Figure 5–8 Regular Invoice (Page 1)

ORACLE

Tejas P	Bill Date	02/01/2012
#423 K.street	Account Number	0.0.0.1-352390
Bangalore	Bill Number	B1-13
KAR 577101	Due Date	03/02/2012

Bill Period: 01/01/2012 To 02/01/2012

Past Due ($)	Current Charges ($)	Payments ($)	Adjustments ($)	Other Charges and Credits ($)	Amount Due ($)
0.00	22.00	0.00	0.00	0.00	22.00

Summary of Current Charges	Amount ($)
Service: IP	20.00
Taxes & Surcharges	2.00
Total Current Charges	22.00

Pay on the web	Questions
My Account at www.oracle.com	1.800.555.7645

Your Payment Slip (Please include this payment slip along with your payment)

Tejas P #423 K.street Bangalore KAR 577101	Bill Date	02/01/2012
	Account Number	0.0.0.1-352390
	Bill Number	B1-13
	Total Due by 03/02/2012	22.00 ($)
	Amount Enclosed:	

Please Mail Cheque Payable To:
Oracle Corporation
P.O. Box 123456
Redwood Shores, USA

Figure 5–9 shows the second page of the regular invoice intentionally left blank.

Figure 5–9 Regular Invoice (page 2)

ORACLE

Account Number
0.0.0.1-352390

Bill Date
02/01/2012

Page
2 of 3

FREE SPACE FOR USE

Figure 5–10 shows the final page of the regular invoice.

Figure 5–10 Regular Invoice (Page 3)

ORACLE

Account Number
0.0.0.1-352390

Bill Date
02/01/2012

Page
3 of 3

Details for Broadband Service

Service: IP

Plan: ads_4_tax
Deal: ads_4_tax

Charge Details

	Amount ($)
Cycle Forward Fees (srvc): ads_4_tax	10.00
Cycle Forward Fees (srvc): ads_4_tax	10.00
Total Recurring Charges	**20.00**
Total Taxes and Surcharges	**2.00**
Total Charges	**22.00**

Corrective Invoice as a Replacement Invoice

The regular bill is corrected on 02/01/2012 and a corrective invoice generated for the corrective bill. Figure 5–11 shows the example corrective invoice in the form of a detail replacement invoice.

Figure 5–11 Replacement Invoice (Page 1 of Detail Format)

ORACLE

Tejas P	Bill Date	02/12/2012
#423 K.street	Account Number	0.0.0.1-352390
Bangalore	Bill Number	CB1-9
KAR 577101	Due Date	03/13/2012
	Previous Bill Number	B1-13
	Previous Bill Date	02/01/2012

Bill Period: 01/01/2012 To 02/01/2012

Past Due ($)	Charges ($)	Payments ($)	Adjustments ($)	Other Charges and Credits ($)	Amount Due ($)
0.00	22.00	0.00	(11.00)	0.00	11.00

Summary of Charges	Amount ($)
Service: IP	20.00
Taxes & Surcharges	2.00
Total Charges	22.00
Prior Payments and Corrections	0.00
Net Charges	22.00
Current Payments and Corrections	(11.00)
Past Due	0.00
Amount Due	11.00

Pay on the web	Questions
My Account at www.oracle.com	1.800.555.7645

Your Payment Slip (Please include this payment slip along with your payment)

Tejas P	Bill Date	02/12/2012
#423 K.street	Account Number	0.0.0.1-352390
Bangalore	Bill Number	CB1-9
KAR 577101	Total Due by 03/13/2012	11.00($)
	Amount Enclosed:	

Please Mail Cheque Payable To:
Oracle Corporation
P.O. Box 123456
Redwood Shores, USA

The first page of the detailed replacement invoice displays the information on the account owner, the billing date, the account number, the corrective bill number, the date when any payment is due on this bill, the previous billing date, the number of the bill that was corrected and the previous billing date.

Below this, the replacement invoice shows the past due amount, charges, payments, adjustments, other charges and credits and the amount due for the billing period.

The summary of charges section lists the details of the charges by type, prior payments and corrections, net charges, current payments and corrections, past due amounts ending with the amount due for this billing period.

The payment information is located at the bottom of this page.

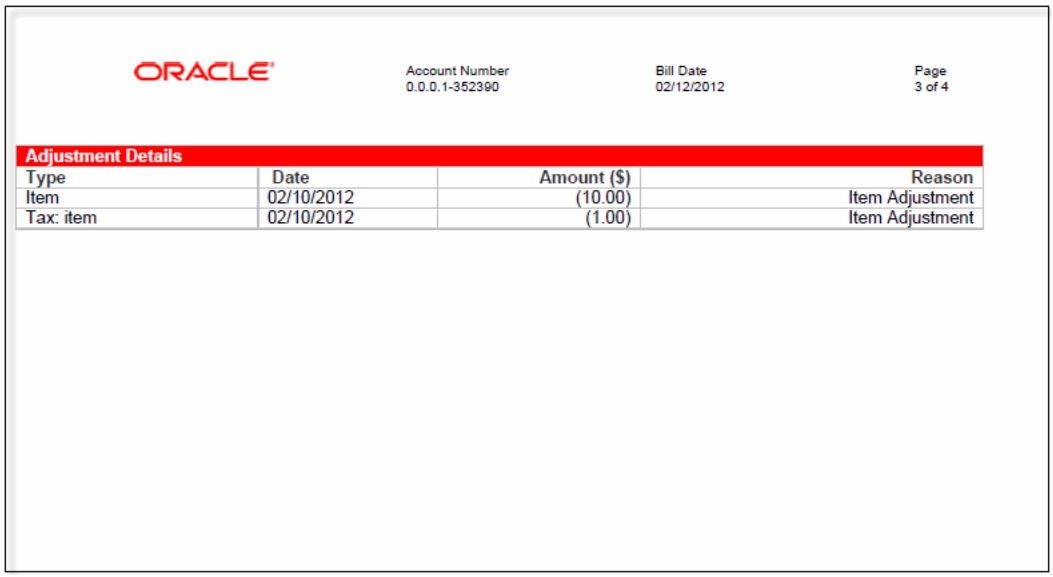
Figure 5–12 shows the second page of the replacement invoice. It is intentionally left blank. The account number and billing date associated with the invoice are listed at the top of this page.

Figure 5–12 Replacement Invoice (Page 2 of Detail Format)

Figure 5–13 shows the third page of a replacement invoice. It contains the details of the adjustments that resulted in the corrective bill. The account number and billing date associated with the invoice are listed at the top of this page.

Each row in the Adjustment Details table lists the description of the adjustment, the date of the adjustment, the amount, and the reason for the action taken (in this example, Item Adjustment).

Figure 5–13 Replacement Invoice (Page 3 of Detail Format)



Adjustment Details

Type	Date	Amount ($)	Reason
Item	02/10/2012	(10.00)	Item Adjustment
Tax: item	02/10/2012	(1.00)	Item Adjustment

Figure 5–14 shows the final section of the example replacement invoice. It contains the details of the charge corrections associated with the corrective bill grouped by the service type. The entries show the previous amount, the correction amount, and the resulting amount due for each adjustment, total recurrent charges, payments and corrections to the recurring charges (past and current), total taxes and surcharges,

payments and corrections (past and current) to total taxes and surcharges. The final entry shows the total charges for this replacement invoice.

Figure 5–14 Replacement Invoice (Page 4 of Detail Format)

ORACLE

Account Number
0.0.0.1-352390

Bill Date
02/12/2012

Page
4 of 4

Details for Broadband Service

Service: IP

Plan: ads_4_tax
Deal: ads_4_tax

Charge Details

	Previous Amount ($)	Payments and Corrections Amount ($)	Amount ($)
Cycle Forward Fees (srvc): ads_4_tax	10.00	0.00	10.00
Cycle Forward Fees (srvc): ads_4_tax	10.00	0.00	10.00
Total Recurring Charges	20.00	0.00	20.00
Other Payments and Corrections to Recurring Charges	(0.00)	(10.00)	(10.00)
Prior Payments and Corrections to Recurring Charges	0.00	(0.00)	0.00
Net Recurring Charges	20.00	(10.00)	10.00
Total Taxes and Surcharges	2.00	0.00	2.00
Other Payments and Corrections to Taxes and Surcharges	(0.00)	(1.00)	(1.00)
Prior Payments and Corrections to Taxes and Surcharges	0.00	(0.00)	0.00
Net Taxes and Surcharges	2.00	(1.00)	1.00
Total Charges ($)	22.00	(11.00)	11.00

6

Invoice Utilities

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

load_pin_invoice_data_map

Use this utility to load invoice data templates into the **/config/invoice_data_map** object in the BRM database. You define the invoice data template in the *BRM_Home*/**data/config/pin_invoice_data_map** file.

For more information, see "Specifying Invoice Data from Pipeline Manager and Custom Applications".

Note: You cannot load separate **/config/invoice_data_map** objects for each brand. All brands use the same object.

Caution: When you run the **load_pin_invoice_data_map** utility, it overwrites the existing invoice data templates. If you are updating a set of templates, you cannot load new templates only. You must load complete sets of invoice data templates each time you run the **load_pin_invoice_data_map** utility.

Important: To connect to the BRM database, the **load_pin_invoice_data_map** 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

```
load_pin_invoice_data_map [-d] [-v] [-h] invoice_data_map_file
```

Parameters

-d

Creates a log file for debugging purposes. Use this parameter when the utility appears to have run with no errors but the invoice data templates have not been loaded into the database.

-v

Displays information about successful or failed processing as the utility runs.

To redirect the output to a log file, use the following command. Replace *filename*.**log** with the name of the log file:

load_pin_invoice_data_map -v > *filename*.**log**

Note: If a file with the same name exists, it is overwritten.

-h

Displays the syntax and parameters for this utility.

invoice_data_map_file

The name and location of the file that defines invoice data templates. The default **pin_invoice_data_map** file is in the *BRM_Home*/**sys/data/config** directory.

If you copy the **pin_invoice_data_map** file to the same directory from which you run the **load_pin_invoice_data_map** utility, you do not need to specify the path or the file name.

If you use the default **pin_invoice_data_map** file name, you do not need to specify it on the command line when it is located in the same directory as this utility.

Results

The **load_pin_invoice_data_map** utility notifies you only if it encounters errors.

Important: You must restart the Connection Manager (CM) to make new invoice data templates available. See "Starting and Stopping the BRM System" in *BRM System Administrator's Guide*.

pin_inv_accts

Use this utility to generate regular invoices and corrective invoices. For regular invoices, run this utility as part of your daily billing to create an invoice for each account that is billed on that day.

> **Note:** For regular invoices, you typically run **pin_inv_accts** as part of **pin_bill_day**, the daily billing script. If you run invoicing separately from **pin_bill_day**, you must run **pin_bill_accts** before you run **pin_inv_accts**.
>
> For corrective invoices, run this utility after you have generated the necessary corrective bills.

For more information on generating regular invoices, see "Designing and Generating Invoices". For more information on generating corrective invoices, see the discussion on corrective invoicing in *BRM Designing and Generating Invoices*.

For information on **pin_bill_day**, see "About Running the Billing Scripts" in *BRM Configuring and Running Billing*.

> **Important:** To connect to the BRM database, the **pin_inv_accts** 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_inv_accts   [-test] [-start date] [-end date] [-regen]
[-corr_bills -reg_bills -corr_type <replacement | correction>] [-summary |
-detail] [-pay_type id | -hierarchy | -file filename] [-skip_blank_billnos]
[-verbose] [-help]
```

Parameters

-test
Runs a test to find out how many accounts meet the criteria without performing the action. The test has no effect on the accounts. This is most useful when run with the **-verbose** option.

-start *date*
-end *date*
Generates invoices for accounts whose billing cycle ended during the time period defined by the start and end date, including the end date. If you do not specify an end date, **pin_inv_accts** uses the current date. If you do not specify a start date, **pin_inv_accts** searches for all invoices that you have not already sent.

You can specify the *date* in either of two formats:

- *MM/DD/YY*

- *-N*, where *N* is the number of days before the current date.

-regen

Regenerates previously created invoices in a different format. A programmer specifies the format in the **PCM_OP_INV_POL_FORMAT_INVOICE** policy opcode. If the opcode specifies a format that the invoices are already stored in, pin_inv_accts regenerates them in that format, overwriting the original invoices and updating the PIN_FLD_INVOICE_OBJ field in the **/bill** object.

To regenerate invoices within a specified date range, use the **-start** and **-end** parameters. If you do not include start and end dates, **pin_inv_accts** regenerates all invoices in the database that are not already stored in the specified format.

To regenerate invoices for subordinate (nonpaying) bills in a billing hierarchy, run the **pin_inv_accts** utility with the **-regen** and **-hierarchy** parameters. By default, invoices are regenerated only for parent bills in a billing hierarchy and for paying non-hierarchical bills.

Note: You can regenerate invoices only if you still have all the original **/event** and **/bill** objects for the months you want to regenerate. If the balances are maintained correctly in the **/bill** objects and are not updated, you can regenerate invoices.

-corr_bills

Generates corrective invoices for corrective bills. The type of corrective invoice it generates depends on the input for **-corr_type**. Additionally, whether the utility generates a summary or detailed corrective invoice document depends on whether **-summary** or **-detail** parameter is set in the input.

- If the **-summary** parameter is set, the **pin_inv_accts** utility generates a summary **Replacement Invoice** when the input parameter is **-corr_type replacement** and a summary **Invoice Correction Letter** when the input parameter is **-corr_type correction**. (As stated earlier, if you did not provide any input for the **-corr_type** parameter, the **pin_inv_accts** utility uses the current value for the corrective invoice type stored with the corrective bill.)
- If the **-detail** parameter is set, the **pin_inv_accts** utility generates a detailed **Replacement Invoice** when the input parameter is **-corr_type replacement** and a detailed **Invoice Correction Letter** when the input parameter is **-corr_type correction**. (As stated earlier, if you did not provide any input for the **-corr_type** parameter, the **pin_inv_accts** utility uses the current value for the corrective invoice type stored with the corrective bill.)

-reg_bills

Generates regular invoices for regular bills (that is, bills that have no corrections). Generates summary invoice if **-summary** parameter is set; generates detailed invoice if **-detail** parameter is set. If you do not specify any of these parameters, **pin_inv_accts** uses **-detail** parameter.

-corr_type <replacement | correction>

Generates replacement invoice if **-corr_type replacement** parameter is set; generates an invoice correction letter if **-corr_type correction** parameter is set. If you do not specify any of these parameters, **pin_inv_accts** uses the current value for the corrective invoice type stored with the corrective bill.

-summary | -detail

Generates summary invoices if the **-summary** parameter is set; generates detailed invoices if the **-detail** parameter is set.

- For regular invoices, if you do not specify any of these parameters, **pin_inv_accts** uses **-detail** parameter.
- For corrective invoices, if you do not specify any of these parameters, **pin_inv_accts** uses the current value for the corrective invoice type stored with the corrective bill.

> **Note:** If you generate both regular and corrective invoices in the same run, BRM generates the same type of invoices (summary or detailed).
>
> If you need to generate one set of invoices as summaries and another set of invoices in detail, run **pin_inv_accts** twice, once for regular invoices and once for corrective invoices.

-pay_type *id*

Generates invoices only for accounts with the specified payment method ID. If you do not specify this parameter, **pin_inv_accts** generates invoices for all payment methods.

Use one payment method ID from Table 6–1:

Table 6–1 Payment Method IDs

Payment Method	ID
undefined	0
prepaid	10000
invoice	10001
debit	10002
credit card	10003
direct debit	10005
smart card	10006
subordinate In Customer Center, this is called *nonpaying*.	10007
beta	10008
internal	10009
guest	10010
cash	10011
check	10012
wire transfer	10013
payorder	10014
postal order	10015
voucher	10016
SEPA	10018

For example, to generate invoices for all bills paid by the check payment method, use this syntax:

```
pin_inv_accts -paytype 10012
```

For more information, see "About Payment Methods" in *BRM Configuring and Collecting Payments*.

-hierarchy

Retrieves bills for A/R accounts in which the bill's PIN_FLD_AR_HIERARCHY_SIZE value exceeds the invoicing threshold and generates a separate invoice for each subordinate bill unit.

For more information, see "About Invoicing for Hierarchical Account Groups".

-file *filename*

Generates an invoice for each bill in the specified file. For example:

```
pin_inv_accts -file bills_020207
```

> **Note:** The file must be in **pin_flist** format, which is the internal BRM data structure. For example:

```
0 PIN_FLD_RESULTS     ARRAY [0]
1 PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26011 0
0 PIN_FLD_RESULTS     ARRAY [1]
1 PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26091 0
```

For more information on the **pin_flist** format, see "About Formats for Storing Invoices".

-skip_blank_billnos

Excludes invoicing for subordinate bill units that do not contain bill numbers.

Subordinate bill units, which use the bill number of their parent account, are generated even when billing for the parent account is suppressed. In such cases, they will not contain bill numbers, which invoices require. Therefore, when bill suppression is enabled on a parent (A/R) account, and the subordinate account threshold is exceeded (multiple threads are used to process the invoices), invoicing fails because the parent bill number is not available. This parameter enables **pin_inv_accts** to proceed without processing these bill units.

(Subordinate bill units only contain bill numbers when their parent accounts are billed.)

-verbose

Displays information about successful or failed processing as the utility runs.

> **Note:** This parameter is always used in conjunction with other parameters and commands. It is not position dependent. For example, you can enter **-verbose** 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_inv_accts** *any_other_parameter* **-verbose >** *filename*.**log**

-help
Displays the syntax and parameters for this utility.

Results

When it is called internally by the **pin_bill_day** script, the **pin_inv_accts** utility logs error information in the **pin_inv.pinlog** file.

pin_inv_doc_gen

Use this utility to create, deliver, and store invoice documents in the Oracle Business Intelligence Publisher (BI Publisher) Scheduler database.

After **/invoice** objects are created by running the **pin_inv_accts** utility, run the **pin_inv_doc_gen** utility on the BI Publisher server to generate the invoice document.

For BI Publisher 11*g*:

Start the **pin_inv_doc_gen** utility by running the **docgen.sh** script on the server running Oracle WebLogic Server. For information on the **docgen.sh** script, see "Generating BI Publisher Invoice Documents in BI Publisher 11g".

Set the **infranet.dmsearchargs.size** parameter in the **Infranet.properties** configuration file to the number of account and bill unit pairs the utility processes at one time. The maximum value for **infranet.dmsearchargs.size** is 14.

For example, if the **InvoiceList.xml** file lists 20 account and bill unit pairs, and **infranet.dmsearchargs.size** is set to **6**, the **pin_inv_doc_gen** utility processes six account and bill unit pairs at a time.

For more information on generating invoices with BI Publisher 11*g*, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 11g".

Important:

- Before running the **pin_inv_doc_gen** utility, save the *BRM_home*/**apps/pin_inv_doc_gen/Infranet.properties.sample** configuration file as **Infranet.properties**.
- To connect to the BRM database, run **pin_inv_doc_gen** from the directory that contains the **Infranet.properties.sample** configuration file.
- BI Publisher 11*g* supports multischema systems.

For more information, see "Configuring the Infranet.properties File for pin_inv_doc_gen with BI Publisher 11g".

For BI Publisher 10*g*

Start the **pin_inv_doc_gen** utility by running the **BipEnv.bat** file on the server running OC4J. For information on the **BipEnv.bat** file, see "Generating BI Publisher Invoice Documents".

Set the **infranet.dmsearchargs.size** parameter in the **Infranet.properties** configuration file to the number of account and bill unit pairs the utility processes at one time. The maximum value for **infranet.dmsearchargs.size** is 14.

For example, if the **InvoiceList.xml** file lists 20 account and bill unit pairs, **infranet.dmsearchargs.size** is set to **6**, the **pin_inv_doc_gen** utility processes six account and bill unit pairs at a time.

For more information on generating invoices with BI Publisher 10*g*, see "Designing and Generating Invoices in Oracle Business Intelligence Publisher 10g".

Important:

- To connect to the BRM database, run **pin_inv_doc_gen** from the directory that contains the **Infranet.properties** configuration file. The **Infranet.properties** configuration file is located in *BIP_Home*/**oc4j_bi/j2ee/home/applications/pin_inv_doc_gen** directory.
- BI Publisher 10*g* supports multischema systems.

For more information, see "Configuring the Infranet.properties File for pin_inv_doc_gen".

Location

For BI Publisher 11*g*: *BRM_Home*/**apps/pin_inv_doc_gen**

For BI Publisher 10*g*: *BIP_Home*/**oc4j_bi/j2ee/home/applications/pin_inv_doc_gen**

Syntax

```
pin_inv_doc_gen    [-accts_list InvoiceList.xml | -type [-consumer | -corporate]
                   [-schema SchemaNumber][-status pending | generated | regen]
                   [-start startDate][-end endDate]
```

Parameters

You must specify at least one parameter. The parameters **-accts_list** and **-type** are mutually exclusive. The parameters **-status** and **-start**, **-end** are valid only if included along with other parameters. The parameter **-schema** is valid only with BI Publisher 11*g*.

-accts_list *InvoiceList*.xml

InvoiceList.xml specifies the list of all the account and bill unit pairs for which an **/invoice** object is generated and stored in the BRM database, and for which an invoice document is not yet generated.

-type

Specifies the type of account for which the invoice document is to be generated:

- **-type consumer** generates a consumer account.
- **-type corporate** generates a corporate account. For a corporate account, all the **/invoice** objects of its subordinate accounts (if they have a separate **/invoice** POID) are selected for generating the invoice document. See "About Invoicing for Hierarchical Account Groups". However, the **/invoice** object of the paying child account is not selected for generating invoice documents of a corporate type.

The **-type** parameter maps to the PIN_FLD_PARENT_FLAGS field of the **/billinfo** object of the **/invoice** object. For consumer accounts, the PIN_FLD_PARENT_FLAGS field value is **0.** For corporate accounts, which are the paying accounts in the account hierarchy, the PIN_FLD_PARENT_FLAGS field value is greater than zero.

-schema *SchemaNumber*

(Valid only for BI Publisher 11*g*) Generates the BRM schema number, in the format **0.0.0**.*n*, for processing BRM invoices. For example,

```
-schema 0.0.0.2
```

processes the BRM invoices in schema 0.0.0.2.

If the schema number is not specified, it defaults to **0.0.0.1**.

For more information, see "Configuring the BRM-BI Publisher Invoicing Integration to Support Multischema Systems".

-status

Specifies the status of the **/invoice** object for which the invoice is to be generated:

- **-status pending** selects the **/invoice** objects for a document that has not been generated. It selects **/invoice** objects with a status of **0** and generates documents for them.
- **-status generated** generates duplicate documents for invoices for a document that has been generated. The duplicate document displays a **Duplicate** watermark on the document. For BI Publisher 11*g*, see "Generating Duplicate Invoice Documents with BI Publisher 11g". For BI Publisher 10*g*, see "Generating Duplicate BI Publisher Invoice Documents".
- **-status regen** (for BI Publisher 10*g*) generates the invoice document with a new **/invoice** object. See "Regenerating BI Publisher Invoice Documents" for more information.

-start *startDate*
-end *endDate*

Generates invoice documents for accounts or bill units whose **/invoice** objects were created during the time period defined by *startDate* and *endDate*.

If you do not specify a start date, **pin_inv_doc_gen** fetches all **/invoice** objects with a status of PIN_INV_STATUS_PENDING.

If you do not specify an end date, **pin_inv_doc_gen** uses the current date. The end date cannot be greater than the current date. The end date specified is inclusive, which means all **/invoice** objects created until 23:59:59 of the end date are selected by the search query.

Specify the date in *MM/DD/YYYY* format.

pin_inv_export

Use this utility to export invoices to a format you can use with other programs, such as DOC1. This command-line utility retrieves invoices from the BRM database and saves them as files.

You specify the format and directory for the invoice files in the invoice utility configuration file. For more information, see "Exporting Invoices" and the instructions in the invoicing configuration file.

The **pin_inv_export** utility generates file names automatically with an **inv** prefix, .

> **Note:** For subordinate bill invoices that are *not* consolidated into the parent invoice, **pin_inv_export** creates a separate invoice file for each subordinate bill. The file naming convention is:
>
> **inv**_*BillPOID_BillDate_SubordinateAccountPOID_ARaccountPOID*.*ext*
>
> For subordinate bill invoices that are consolidated into the parent invoice and are exported as an individual invoice, the file name will *not* contain the parent account POID. Instead, it will be in the format:
>
> **inv**_*BillPOID_BillDate_SubordinateAccountPOID.ext*

> **Important:** To connect to the BRM database, the **pin_inv_export** 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_inv_export     [-start date] [-end date]
                   [ -trial | -detail filename] [-verbose] [-help]
```

Parameters

-start *date*
-end *date*
Retrieves invoices for accounts whose billing cycle ended during the time period defined by the start and end date, including the end date.

If you do not specify an end date, **pin_inv_export** uses the current date. If you do not specify a start date and an end date, **pin_inv_export** creates a file for every invoice in the database.

You can specify the *date* in either of two formats:

- *MM/DD/YY*
- *-N*, where *N* is the number of days before the current date.

For example:

pin_inv_export -verbose -start 01/01/09 -end 01/10/09

pin_inv_export -verbose -start -10, sets the start date to 10 days before the current date and the end date to the current date.

-trial

Exports trial invoices (**/invoice/trial**).

> **Note:** If a custom **/invoice** subclass exits, invoices of type **/invoice/.../trial** are exported.

-detail *filename*

Exports detailed invoices for the bills listed in the specified file. This parameter overrides the PIN_FLD_INV_TYPE value specified in the **/payinfo** object associated with the bill.

The file must be in pin_flist format and can contain any number of bills. For example:

```
0 PIN_FLD_RESULTS     ARRAY [0]
1 PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26011 0
0 PIN_FLD_RESULTS     ARRAY [1]
1 PIN_FLD_POID        POID [0] 0.0.0.1 /bill 26091 0
```

For more information on generating a pin_flist file of bills, see "pin_inv_accts".

-verbose

Displays information about successful or failed processing as the utility runs.

> **Note:** This parameter is always used in conjunction with other parameters and commands. It is not position dependent. For example, you can enter **-verbose** 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.
>
> **pin_inv_export** *any_other_parameter* **–verbose >** *filename***.log**
>
> where *filename* is the name of the log file.

-help

Displays the syntax and parameters for this utility.

pin_inv_send

Use this utility to email or print invoices, depending on the delivery method specified in Customer Center:

- If the delivery method is set to **Email**, **pin_inv_send** emails the invoice.
- If the delivery method is set to **Postal**, **pin_inv_send** prints the invoice.

This setting is in Payment Details panel of Customer Center.

You can configure the following behavior by editing the **pin_inv_send** utility's configuration file *(BRM_Home*/**apps/pin_inv/pin.conf**).

- To set the maximum size in kilobytes of invoices that can be sent by email, set the **inv_send_size** entry. This entry is used by PCM_OP_INV_VIEW_INVOICE to restrict sending large invoices to the Email Data Manager (**dm_email**).
- To send individual subordinate bill invoices to the email address of the parent A/R bill, set the **send_sub_inv_2_parent** entry.

The Email Data Manager must be running when you run this utility, even for printing. For information, see "Sending Email to Customers Automatically" in *BRM Managing Customers* and "Configuring the Email Data Manager for Printing".

For more information about sending invoices, see "Sending Invoices to Customers".

> **Important:** To connect to the BRM database, the **pin_inv_send** 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_inv_send    [-start date] [-end date] [-pay_type id]
                [-format_id id] [-v] [-h]
```

Parameters

-start *date*
-end *date*
Emails or prints invoices for accounts with invoices whose billing cycle ended during the time period defined by the start and end date, including the end date. If you do not specify an end date, **pin_inv_send** uses the current date. If you do not specify a start date, **pin_inv_send** searches for all invoices that you have not already sent.

You can specify the *date* in either of two ways:

- *MM/DD/YY*
- *-N*, where *N* is the number of days before the current date.

-pay_type *id*

Emails or prints invoices only for accounts with the specified payment method. If you do not specify this parameter, **pin_inv_send** emails or prints invoices for invoice payment methods only.

Use one payment method ID from Table 6–2:

Table 6–2 Payment Method IDs

Payment Method	ID
undefined	0
prepaid	10000
invoice	10001
debit	10002
credit card	10003
direct debit	10005
smart card	10006
subordinate In Customer Center, this is called *nonpaying*.	10007
beta	10008
internal	10009
guest	10010
cash	10011
check	10012
wire transfer	10013
payorder	10014
postal order	10015
voucher	10016
SEPA	10018

For example, to email or print invoices for all bills paid by the check payment method, enter this command:

```
pin_inv_send -pay_type 10012
```

For more information on payment methods, see "About Payment Methods" in *BRM Configuring and Collecting Payments*.

-format_id *id*

Specifies the invoice's format. By default, **pin_inv_send** mails invoices in HTML format. Use this parameter to use DOC1 format instead. The format ID can have these values:

Table 6–3 Format ID Values

Format	ID
HTML	1
DOC1	3

-v

Displays information about successful or failed processing as the utility runs.

> **Note:** This parameter is always used in conjunction 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_inv_send** *any_other_parameter* **–v >** *filename***.log**

-h

Displays the syntax and parameters for this utility.

pin_load_invoice_events

Use this utility to load brand-specific **/config/invoice_events** objects into the BRM database. This utility extends branding to invoices by associating specified event objects with a specific brand. When invoices are generated, BRM displays the brand's events in the invoice. If you do not load **/config/invoice_events** objects, BRM uses the **/config/invoice_events** object that belongs to the root account.

For information about invoices for brands, see "About Brand-Specific Invoices".

Note: You cannot load separate **/config/invoice_events** objects for each brand. All brands use the same object.

Important: To connect to the BRM database, the **pin_load_invoice_events** 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_load_invoice_events  -brand "brand_poid" -eventfile file
                         [-logfile file] [-reload] [-debug] [-help]
```

Parameters

-brand *"brand_poid"*
Specifies the brand POID, for example, "**0.0.0.1 /account 104 0**".

-eventfile *file*
Specifies the pathname of the event file. The events in the file should be listed one per line. For example:

/event/billing/adjustment/account

/event/billing/adjustment/event

/event/billing/adjustment/item

/event/billing/adjustment/tax_event

/event/billing/cycle/tax

/event/billing/payment/cash

/event/billing/payment/cc

...

-logfile *file*
Specifies the full pathname of the log file.

-reload
Reloads an existing **/config** object for a brand.

-debug
Logs the flist and detailed messages in the log file.

-help
Displays the syntax and parameters for this utility.

Results

This utility should notify you that it was successful. If errors are returned, look in the utility log file **(default.pinlog)** for detailed error messages. The log file is located either in the directory from which the utility was started, or in a directory specified in the configuration file.

pin_load_invoice_template

Use this utility to load brand specific objects into the BRM database. These objects contain the style sheet templates that you apply to invoices. The templates let you specify the look of invoices that belong to specific brands.

There are two usages for this utility:

- You can load **/config/invoice_templates** brand specific objects into the BRM database. If you do not load **/config/invoice_templates** objects, BRM uses the **/config/invoice_templates** object that belongs to the root account.
- You can change the flag that specifies whether to use an HTML template or an XSL style sheet for an existing template object.

For information about creating invoice templates, see "Designing Invoice Templates".

Note: You cannot load separate **/config/invoice_templates** objects for each brand. All brands use the same object.

Important: To connect to the BRM database, the **pin_load_invoice_template** 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_load_invoice_template -brand "brand_poid" -type template_type
                          -locale locale_string
                          -template template_file [-usexsl]
                          [-debug] [-logfile logfile] [-help]
```

Parameters

-brand *"brand_poid"*
Specifies the brand account POID for which you are loading the template. For example, "0.0.0.1 /account 104 0"

If your system is not brand enabled, you must use the POID of the root account: "0.0.0.1 /account 1".

Important: The quotation marks are required.

-type *template_type*
Specifies the template type. To use an HTML template, specify "HTML". To use an XSL style sheet, specify a mime type, for example, "text/html".

> **Note:** The **-template** option must specify a file containing a template of the same type you specify in this option.

-locale *locale_string*
Specifies the locale. For example, en_US.

-template *template_file*
Specifies the full pathname of the template file.

-usexsl
Uses the XSL invoice formatting opcode. This option sets the **PIN_FLD_FLAG** field in the **/config/invoice_templates** object to XSL style sheets.

-debug
Logs the flist and detailed messages in the log file.

-logfile *logfile*
Specifies the full pathname of the log file.

-help
Displays the syntax and parameters for this utility.

Changing the Template Flag

To change the flag that specifies whether to use an HTML template or an XSL style sheet, set the PIN_FLD_FLAGS field in the **/config/invoice_templates** object by using this syntax:

- For an HTML template:

  ```
  pin_load_invoice_template -brand brand_poid
  ```

- For an XSL style sheet:

  ```
  pin_load_invoice_template -brand brand_poid [-usexsl]
  ```

  When the **-usexsl** option is not specified, an HTML template will be used.

Results

This utility should notify you that it was successful. If errors are returned, look in the utility log file **(default.pinlog)** for detailed error messages. The log file is located either in the directory from which the utility was started, or in a directory specified in the configuration file.

pin_upd_assoc_bus_profile

Use this utility to associate bill units with an invoicing business profile. It searches the BRM database for **/billinfo** objects with an empty PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST field and populates the field with an **/associated_bus_profile** object. See "Associating Pre-Existing Bill Units with Business Profiles".

Before running **pin_upd_assoc_bus_profile**, you must:

- Load invoicing business profiles into the database. See "Loading Invoicing Business Profiles into the Database".
- Enable the BRM-BI Publisher integration framework. See "Enabling the BRM-BI Publisher Integration".

> **Note:** This utility fails if you attempt to run it when the BRM-BI Publisher integration framework is disabled.

This utility is supported in branding environments. See "About Branding" in *BRM Managing Customers*.

> **Important:** The **pin_upd_assoc_bus_profile** utility needs the configuration file in *BRM_Home*/**apps/pin_billd**. This configuration file must be present in the directory from which you run the utility.
>
> Because **pin_upd_assoc_bus_profile** is based on the BRM multithreaded application (MTA) framework, the configuration file also requires some performance-related configuration entries. For more information, see "Configuring Your Multithreaded Application" in *BRM Developer's Guide*.

Location

BRM_Home/**bin**

Syntax

pin_upd_assoc_bus_profile [**-file** *filename*][**-verbose**][**-help**]

Parameters

-file *filename*
Specifies the name and location of the input file that lists the **/billinfo** objects to update. This is an optional parameter.

The input file should be in the following format:

```
0 PIN_FLD_RESULTS       ARRAY [0] allocated 20, used 1
1     PIN_FLD_POID           POID [0] 0.0.0.1 /billinfo 37395 1
0 PIN_FLD_RESULTS       ARRAY [1] allocated 20, used 1
1     PIN_FLD_POID           POID [0] 0.0.0.1 /billinfo 37488 3
```

-verbose
Displays information about successful or failed processing as the utility runs.

-help
Displays the syntax and parameters for this utility.