## Contents

**Preface**
- Audience ................................................................................................................................. xv
- Downloading Oracle Communications Documentation ............................................................. xv
- Documentation Accessibility ..................................................................................................... xv
- Document Revision History ...................................................................................................... xv

### 1 About Upgrading BRM Releases

#### About Upgrading BRM to a New Release .............................................................................. 1-1
- Direct and Incremental Upgrades .......................................................................................... 1-2

#### Planning your Upgrade ........................................................................................................ 1-2
- Identifying Your Upgrade Team .............................................................................................. 1-3
- Identifying Who is Affected by the Upgrade ........................................................................ 1-3
- Collecting Information About Your System ........................................................................... 1-3
- Determining the Impact of New Features ............................................................................. 1-4
- Estimating How Long the Upgrade Will Take ........................................................................ 1-4
  - How Long Will It Take to Run the database Upgrade Scripts? ........................................... 1-5
  - How Long Will It Take to Plan, Prepare for, Test, and Perform the Upgrade? ................. 1-5
- Maintaining Access to Services While Upgrading ................................................................. 1-5

#### Updating Your System Environment .................................................................................. 1-5

#### Creating Test Environments ............................................................................................... 1-6
- Old Baseline Release .............................................................................................................. 1-6
- Old Customized Release ......................................................................................................... 1-7
- New Baseline Release ........................................................................................................... 1-7
- New Customized Release (Test System) .............................................................................. 1-7

#### Transferring Customizations to the New Release ................................................................. 1-7
- Upgrading Customized Policy Source Files ......................................................................... 1-8
- Upgrading Configuration Files .............................................................................................. 1-8
- Upgrading Database Customizations ..................................................................................... 1-8
  - Modifying the Content of Custom Tables ......................................................................... 1-8
  - Modifying the Structure of Custom Tables ....................................................................... 1-9
  - Fixing Standard Database Objects with Nonstandard Object IDs .................................. 1-9
- Updating Custom Reports ...................................................................................................... 1-9
- Updating Custom Applications ............................................................................................. 1-9

#### Testing Your Upgraded System .......................................................................................... 1-10
- Running Old and New Versions in Parallel .......................................................................... 1-10
2 Feature changes from BRM 7.3.1 to BRM 7.4

AAA Gateway Manager .............................................................................................................. 2-1
  Diameter changes .................................................................................................................. 2-1
Billing ...................................................................................................................................... 2-1
  Accounting type set at bill unit level .................................................................................... 2-1
GSM AAA standard opcodes .................................................................................................. 2-2
Pricing ...................................................................................................................................... 2-2
  LoadIfwConfig enhancements ............................................................................................ 2-2
RADIUS Manager .................................................................................................................... 2-3
  RADIUS configuration file changes .................................................................................... 2-3
Roaming Manager ..................................................................................................................... 2-3
Services Framework .................................................................................................................. 2-4
  Services Framework now supports non-telco services ....................................................... 2-4
    About provisioning non-telco services ............................................................................ 2-4
    About managing non-telco services ................................................................................ 2-5
    About processing AAA requests for non-telco services .................................................. 2-5
System Administration ............................................................................................................. 2-5
  MD5 password encryption no longer supported ................................................................ 2-5

3 Storable Class Changes from BRM 7.3.1 to BRM 7.4

  Changed Storable Classes .................................................................................................... 3-1
  Obsoleted Storable Classes ................................................................................................. 3-4

4 Opcode Changes from BRM 7.3.1 to BRM 7.4

  Changed Policy Opcodes ...................................................................................................... 4-1
    Activity FM Policy Opcodes .............................................................................................. 4-2
    Billing FM Policy Opcodes ............................................................................................... 4-2
    Content Manager FM Policy Opcodes ............................................................................. 4-2
    Customer FM Policy Opcodes ......................................................................................... 4-2
    GPRS Manager 3.0 FM Policy Opcodes .......................................................................... 4-6
    GSM AAA Manager FM Helper Policy Opcodes ............................................................. 4-6
    GSM Manager FM Policy Opcodes .................................................................................. 4-6
    IMT Manager FM Policy Opcodes .................................................................................... 4-7
    IP Address Manager FM Policy Opcodes ........................................................................ 4-7
    Payment FM Policy Opcodes ........................................................................................... 4-8
    Price List FM Policy Opcodes ........................................................................................ 4-8
    Process Audit FM Policy Opcodes ................................................................................... 4-9
    Provisioning FM Policy Opcodes .................................................................................... 4-9
    Rating FM Policy Opcodes .............................................................................................. 4-10
    Radius Manager FM Policy Opcodes ............................................................................... 4-12
5 Utility Changes from BRM 7.3.1 to BRM 7.4

Changed Utilities .................................................................................................................. 5-1

6 Pipeline Manager Changes from BRM 7.3.1 to BRM 7.4

Changed Pipeline Manager Modules ...................................................................................... 6-1

New BRM EDR Container Fields .......................................................................................... 6-1
  Associated CAMEL Extension Record .............................................................................. 6-2
  Associated Roaming Extension Record ............................................................................ 6-2
  Associated Suspense Extension Record ........................................................................... 6-2
  Charge Breakdown Record Tax Packet ............................................................................. 6-2
  Header Record .................................................................................................................. 6-2
  Supplementary Charge Packet Record .............................................................................. 6-3
  Total Advised Charge Value List ...................................................................................... 6-3

New AAA EDR Container Fields .......................................................................................... 6-3
  New Function Module Fields ............................................................................................ 6-3
  Changed Opcode Blocks .................................................................................................... 6-4
7 Notification Event Changes from Portal 7.3.1 to BRM 7.4

Changed Notification Events ........................................................................................................ 7-1

8 Storable Class Changes from Portal 7.3 to BRM 7.3.1

Changed Storable Classes ........................................................................................................ 8-1

9 Feature Changes from Portal 7.3 to BRM 7.3.1

AAA Gateway Manager Changes .......................................................................................... 9-1
MBI Protocol Support ............................................................................................................. 9-1
  GSM Requests-to-Opcode Mapping Changes ...................................................................... 9-1
  MBI Administrative Messages-to-Opcode Mapping Changes ........................................... 9-2
  MBI Grammar and Mapping File Changes ....................................................................... 9-2
  MBI CDR Grammar and Mapping File Changes ............................................................... 9-2
  EDR Container Changes ..................................................................................................... 9-2
  Changes to the MBI Registry File ...................................................................................... 9-3
Timeout and Replay Pipeline Changes .................................................................................. 9-3
Pipeline Manager Changes ................................................................................................... 9-3
  Pipeline Manager Uses Business Parameter Settings from the BRM Database ................ 9-4
Taxation Changes .................................................................................................................... 9-4
Telco Framework Changes .................................................................................................... 9-4
  Telco Framework Renamed to Services Framework ......................................................... 9-4

10 Notification Event Changes from Portal 7.3 to BRM 7.3.1

Changed Notification Events .................................................................................................. 10-1

11 Opcode Changes from Portal 7.3 to BRM 7.3.1

Changed Policy Opcodes ......................................................................................................... 11-1
  Activity FM Policy Opcodes ............................................................................................... 11-1
  Accounts Receivable FM Policy Opcodes .......................................................................... 11-2
  Billing FM Policy Opcodes ............................................................................................... 11-2
  Customer FM Policy Opcodes ........................................................................................... 11-5
  GPRS AAA Manager FM Policy Opcodes ........................................................................... 11-11
  GSM AAA Manager FM Policy Opcodes .......................................................................... 11-12
  GSM Manager FM Policy Opcodes .................................................................................... 11-12
  Invoice Manager FM Policy Opcodes ................................................................................ 11-12
  Number Manager Policy Opcodes ..................................................................................... 11-13
  Payment FM Policy Opcodes ............................................................................................. 11-14
  Pricing FM Policy Opcodes ............................................................................................... 11-14
  Process Audit FM Policy Opcodes ..................................................................................... 11-14
  Rating FM Policy Opcodes ............................................................................................... 11-16
  Remittance FM Policy Opcodes .......................................................................................... 11-18
  Resource Reservation FM Policy Opcodes ........................................................................ 11-19
  SIM Card Manager FM Policy Opcodes ............................................................................ 11-20
  Subscription FM Policy Opcodes ....................................................................................... 11-20
  Services Framework AAA Manager FM Policy Opcodes ................................................ 11-24
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voucher FM Policy Opcodes</td>
<td>11-24</td>
</tr>
<tr>
<td>Zone Map FM Policy Opcodes</td>
<td>11-24</td>
</tr>
<tr>
<td><strong>Changed Standard Opcodes</strong></td>
<td>11-25</td>
</tr>
<tr>
<td>Activity FM Standard Opcodes</td>
<td>11-25</td>
</tr>
<tr>
<td>Accounts Receivable (A/R) Standard Opcodes</td>
<td>11-29</td>
</tr>
<tr>
<td>Balance FM Standard Opcodes</td>
<td>11-34</td>
</tr>
<tr>
<td>Balance Monitoring FM Standard Opcodes</td>
<td>11-35</td>
</tr>
<tr>
<td>Base Opcodes</td>
<td>11-35</td>
</tr>
<tr>
<td>Billing FM Standard Opcodes</td>
<td>11-35</td>
</tr>
<tr>
<td>Channel FM Standard Opcodes</td>
<td>11-38</td>
</tr>
<tr>
<td>Content Manager FM Standard Opcodes</td>
<td>11-38</td>
</tr>
<tr>
<td>Customer FM Standard Opcodes</td>
<td>11-39</td>
</tr>
<tr>
<td>Device FM Standard Opcodes</td>
<td>11-63</td>
</tr>
<tr>
<td>Filter Set FM Standard Opcodes</td>
<td>11-64</td>
</tr>
<tr>
<td>Group FM Standard Opcodes</td>
<td>11-64</td>
</tr>
<tr>
<td>GSM AAA Manager FM Standard Opcodes</td>
<td>11-65</td>
</tr>
<tr>
<td>GSM Manager FM Standard Opcodes</td>
<td>11-66</td>
</tr>
<tr>
<td>IC FM Standard Opcodes</td>
<td>11-66</td>
</tr>
<tr>
<td>Invoicing FM Standard Opcodes</td>
<td>11-66</td>
</tr>
<tr>
<td>Number Manager FM Standard Opcodes</td>
<td>11-67</td>
</tr>
<tr>
<td>Order Manager FM Standard Opcodes</td>
<td>11-67</td>
</tr>
<tr>
<td>Payment FM Standard Opcodes</td>
<td>11-67</td>
</tr>
<tr>
<td>Permissioning FM Standard Opcodes</td>
<td>11-70</td>
</tr>
<tr>
<td>Price FM Standard Opcodes</td>
<td>11-70</td>
</tr>
<tr>
<td>Process Audit FM Standard Opcodes</td>
<td>11-72</td>
</tr>
<tr>
<td>RADIUS Manager FM Standard Opcodes</td>
<td>11-73</td>
</tr>
<tr>
<td>Rating FM Standard Opcodes</td>
<td>11-73</td>
</tr>
<tr>
<td>Remittance FM Standard Opcodes</td>
<td>11-76</td>
</tr>
<tr>
<td>Resource Reservation FM Standard Opcodes</td>
<td>11-76</td>
</tr>
<tr>
<td>SDK FM Standard Opcodes</td>
<td>11-76</td>
</tr>
<tr>
<td>Subscription FM Standard Opcodes</td>
<td>11-78</td>
</tr>
<tr>
<td>Suspense FM Standard Opcodes</td>
<td>11-85</td>
</tr>
<tr>
<td>Services Framework AAA Manager FM Standard Opcodes</td>
<td>11-86</td>
</tr>
<tr>
<td>Voucher FM Standard Opcodes</td>
<td>11-88</td>
</tr>
<tr>
<td><strong>Renamed Opcodes</strong></td>
<td>11-88</td>
</tr>
</tbody>
</table>

# 12 Pipeline Manager Changes from Portal 7.3 to BRM 7.3.1

## Changed Pipeline Manager Modules

- **New EDR Container Fields**
  - Basic Detail Record .......................................................................................... 12-2
  - Associated Charge Breakdown Record - Update Balance Packet ....................... 12-2
  - Associated Charge Breakdown Record - Supplementary Charge Packet Record .... 12-2
  - Split Charge Packet ....................................................................................... 12-2
  - Discount Sub-Balance Packet ......................................................................... 12-3
13 Utility Changes from Portal 7.3 to BRM 7.3.1

Changed Utilities .................................................................................................................. 13-1

14 Upgrading from BRM 7.3.1 to BRM 7.4

Upgrade Patches .................................................................................................................. 14-1
7.3.1-to-7.4 Upgrade ............................................................................................................ 14-1
  Shutting Down the Current Instance .................................................................................. 14-2
  Backing Up Files .............................................................................................................. 14-2
  Turning Off BRM Service Authentication and Authorization ......................................... 14-3
  Backing Up your BRM 7.3.1 Database ........................................................................... 14-3
  Setting the Environment Variables .................................................................................... 14-3
  Installing the Overlay Upgrade Patch ............................................................................. 14-4
  Upgrading the BRM Database Schema .......................................................................... 14-4
  Upgrading the Pipeline Manager Database Schema ...................................................... 14-5
  Installing the Overlay Upgrade Patch on a Multidatabase System ............................. 14-6
  Installing BRM 7.4 Client Applications ........................................................................... 14-6
  Adding Customizations .................................................................................................... 14-6
  Restoring Service Authentication ..................................................................................... 14-7
Post Upgrade Procedures .................................................................................................... 14-7
  Creating an Oracle AQ Database Queue ........................................................................ 14-7
  Loading pin_notify ........................................................................................................... 14-8
  Removing the xml.jar File (AIX Only) ......................................................................... 14-8
  Uninstalling an Upgrade Package .................................................................................... 14-8

15 Upgrading from Portal 7.3 to BRM 7.4

Upgrade Patches .................................................................................................................. 15-1
7.3-to-7.4 Upgrade ............................................................................................................. 15-1
  Shutting Down the Current Instance ................................................................................ 15-2
  Backing Up Files ............................................................................................................. 15-2
  Turning Off Portal Service Authentication and Authorization .................................... 15-3
  Backing Up Your Portal 7.3 Database .......................................................................... 15-3
  Installing Portal 7.3 Patches ........................................................................................... 15-3
  Setting the Environment Variables .................................................................................. 15-4
  Installing the Overlay Upgrade Patch ........................................................................... 15-5
  Upgrading the Portal Database Schema ........................................................................ 15-5
  Upgrading the Pipeline Manager Database Schema .................................................... 15-5
  Installing the Overlay Upgrade Patch on a Multidatabase System ........................... 15-6
  Installing BRM 7.4 Client Applications ........................................................................ 15-7
  Adding Customizations .................................................................................................... 15-7
  Restoring Service Authentication ..................................................................................... 15-7
Post Upgrade Procedure .................................................................................................... 15-7
  Loading pin_notify ........................................................................................................... 15-8
  Uninstalling an Upgrade Package .................................................................................... 15-8

16 Upgrading from Portal 7.3 to BRM 7.3.1

Upgrade Patches .................................................................................................................. 16-1
17 Upgrading from GPRS Manager Release 2.0 to Release 3.0

About Upgrading GPRS Manager ................................................................. 17-1

Important Information for System Administrators ............................... 17-1

Oracle Database Character Sets ............................................................... 17-1

Preparing Your Environment for the Upgrade ........................................ 17-1

Reviewing the Default Database Schema .................................................. 17-2

Preparing an Oracle Database ................................................................. 17-2

Upgrading GPRS Manager ...................................................................... 17-3

Backing Up GPRS Manager 2.0 Files ....................................................... 17-3

Turning Off Portal Service Authentication and Authorization .................. 17-3

Shutting Down Portal ................................................................................ 17-4

Backing Up Your Portal Database ............................................................. 17-4

Installing the Third-Party Software .......................................................... 17-4

Installing GPRS Manager Server 3.0 ....................................................... 17-4

Installing the Upgrade Scripts ................................................................. 17-5

Configuring the Upgrade Parameters ...................................................... 17-5

Creating Required Database Objects and the Upgrade Log Directory .... 17-6

Performing Pre-Upgrade Sanity Checks ................................................... 17-6

Generating List of Tables and Indexes in 3.0 Schema ............................. 17-7

Generating Your 3.0 Tables List ............................................................... 17-7

Generating 3.0 Index List ......................................................................... 17-7

Running the Database Upgrade Scripts .................................................... 17-7

Running pin_setup to Configure GPRS Manager .................................... 17-8

Restoring Service Authentication ............................................................ 17-8

Dropping Obsolete Database Objects from the Database ....................... 17-8

Upgrading Events ..................................................................................... 17-8

Command-line Scripts ............................................................................ 17-9
18 Migrating Data to an Oracle In-Memory Database Cache-Enabled BRM System

About Migrating Data to an Oracle IMDB Cache-Enabled BRM System .................................................. 18-1
BRM Processes That Cannot Co-exist with IMDB Cache Manager .......................................................... 18-2
How IMDB Cache Manager Migrates Your Existing BRM Accounts ...................................................... 18-2
How IMDB Cache Manager Handles Subscriber Distribution for Account Migration ......................... 18-3
How IMDB Cache Manager Handles POID Fields .................................................................................. 18-3
Using the Same Logical Partition for Hierarchical Accounts .................................................................. 18-4
Overview of the Migration Process .......................................................................................................... 18-4
Configuration Entries Required for Migration ........................................................................................... 18-5
Preparing Accounts for Distribution into IMDB Cache Logical Partitions ............................................. 18-6
Migrating a BRM TIMOS Environment to an IMDB Cache Environment ................................................ 18-6
Loading Subscriber Data from the BRM Database into the Oracle IMDB Cache Data Stores ............... 18-7
Changes to BRM after Installing IMDB Cache Manager .......................................................................... 18-7
Opcode Changes ......................................................................................................................................... 18-7
Utility Changes .......................................................................................................................................... 18-7

19 Upgrading from Pipeline Manager 7.2 to Pipeline Manager 7.3

Important information for System Administrators ................................................................................. 19-1
Oracle Database Character Sets ................................................................................................................. 19-1
Verifying the Pipeline Manager Release Number ..................................................................................... 19-1
Upgrading the Oracle Software and Database ........................................................................................... 19-2
Granting New Privileges to the Portal Integrate User ............................................................................... 19-2
Upgrading Pipeline Manager .................................................................................................................... 19-2
Shutting Down Pipeline Manager .............................................................................................................. 19-3
Uninstalling Pipeline Manager 7.2 ............................................................................................................ 19-3
Installing the Third-Party software ........................................................................................................... 19-3
Installing Pipeline Manager ...................................................................................................................... 19-3
Installing the Upgrade Scripts ................................................................................................................... 19-3
Configuring the Upgrade Parameters ........................................................................................................ 19-4
Creating Required Database Objects and the Upgrade Log Directory ..................................................... 19-4
Running the Database Upgrade Scripts ..................................................................................................... 19-4
Re-creating your Account Synchronization Queues .................................................................................. 19-5
Enabling Auditable Fields .......................................................................................................................... 19-5
Testing the Upgraded Pipeline System ...................................................................................................... 19-5
Loading the Tailor-Made Stored Procedure.............................................................................................. 19-5
Command-line Scripts ............................................................................................................................... 19-5
20 Upgrading from GSM Manager Release 1.0 to Release 2.0

About Upgrading GSM Manager ................................................................. 20-1
Important Information for System Administrators .............................. 20-1
Oracle Database Character Sets............................................................... 20-1
Preparing Your Environment for the Upgrade ...................................... 20-2
Reviewing the Default Database Schema .............................................. 20-2
Preparing an Oracle Database .............................................................. 20-2
Upgrading GSM Manager .................................................................... 20-3
Backing Up GSM Manager 1.0 Files .................................................. 20-3
Turning Off Portal Service Authentication and Authorization .............. 20-4
Shutting Down Portal ............................................................................ 20-4
Backing Up Your Portal Database ....................................................... 20-4
Installing the Third-Party Software ..................................................... 20-4
Installing GSM Manager Server 2.0 .................................................. 20-4
Installing the Upgrade Scripts .............................................................. 20-5
Configuring the Upgrade Parameters ............................................... 20-6
Creating Required Database Objects and the Upgrade Log Directory ...... 20-7
Performing Pre-Upgrade Sanity Checks .............................................. 20-7
Generating a List of Tables and Indexes in the 2.0 Schema ................... 20-8
Generating Your 2.0 Tables List .......................................................... 20-8
Generating 2.0 Index List ................................................................... 20-8
Running the Database Upgrade Scripts .............................................. 20-8
Installing Patch 4489 ...................................................................... 20-9
Running pin_setup to Configure GSM Manager ............................... 20-9
Restoring Service Authentication ....................................................... 20-9
Dropping Obsolete Database Objects from the Database ................... 20-9
Command-Line Scripts ....................................................................... 20-9
About the upg_mgr.pl Script ............................................................... 20-9
Syntax ................................................................................. 20-10
Parameters ......................................................................... 20-10
About the Upgrade.pl Script ............................................................... 20-10
About the Upgrade Scripts and Files ............................................... 20-10
Offline Scripts ..................................................................... 20-11
Online Scripts ..................................................................... 20-11
Miscellaneous Scripts and Files .................................................... 20-11

21 Upgrading from Revenue Assurance Manager Release 2.0 to Release 3.0

Preparing Your Environment for the Upgrade ..................................... 21-1
Upgrading the Oracle Software and Database .................................. 21-1
Upgrading the Portal Database for Revenue Assurance Manager 3.0 ... 21-1
Backing Up Revenue Assurance Manager 2.0 Files .......................... 21-2
Loading Release 2.0 Batch Rating Data ........................................... 21-2
Shutting Down Portal ........................................................................................................ 21-2
Back Up Your Portal Database ........................................................................................ 21-3
Installing the Third-Party Software ............................................................................... 21-3
Installing Revenue Assurance Manager Server 3.0 ....................................................... 21-3
Installing the Upgrade Scripts ....................................................................................... 21-3
Configuring the Upgrade Parameters ............................................................................ 21-4
Creating Required Database Objects and the Upgrade Log Directory......................... 21-5
Performing Pre-Upgrade Sanity Checks ....................................................................... 21-5
Running the Database Upgrade Scripts ......................................................................... 21-6
Running pin_setup to Configure Revenue Assurance Manager .................................... 21-6
Restoring Service Authentication .................................................................................. 21-7
Dropping Obsolete Database Objects from the Database .............................................. 21-7

**22 Understanding and Migrating Discount Data**

About Discount Data Migration ....................................................................................... 22-1
Discounting Differences Between Infranet 6.5 and Portal 7.3 ....................................... 22-2
Migrating Discount Data ................................................................................................. 22-4
Overview of the Discount Data Migration Process ......................................................... 22-4
Upgrading Your System to Portal 7.3 ............................................................................ 22-4
Migrating Discount Data from the Pipeline 6.5 Database to the Portal 7.3 Database ...... 22-4
   Re-Creating Your Custom Resource IDs on the Portal 7.3 Database ......................... 22-5
   Retrieving the Discount Migration Utility .................................................................... 22-5
   Modifying Service Code Mappings ............................................................................. 22-6
Extracting Discount Data from the Pipeline 6.5 Database ........................................... 22-7
Loading Discount Configuration Data into the Portal 7.3 Database ............................. 22-8
Retaining Discount Model ERAs from Portal Release 6.5 ............................................. 22-8
Loading Subscription Mapping Data into the Portal 7.3 Database ............................... 22-9
Loading Discount Balance Data into the Portal 7.3 Database ....................................... 22-10
Upgrading Your System to Pipeline Manager 7.3 ................................................................. 22-11
Performing Post-Migration Updates .................................................................................... 22-11
  Updating Cross-Product Discounts After Migrating Discount Data ......................... 22-12
  Creating System Discounts After Migrating Discount Data ................................... 22-12
Using Discount Data Migration Utilities ......................................................................... 22-14
DMTDScntMig ................................................................................................................... 22-15
migrate_discount_balances.pl ...................................................................................... 22-18
pin_smt ............................................................................................................................. 22-19
This book provides information on how to upgrade your existing system to later versions of Oracle Communications Billing and Revenue Management (BRM) releases.

Audience

This document is intended for systems integrators, system administrators, database administrators, and other individuals who are responsible for installing and upgrading BRM from release to release.

Downloading Oracle Communications Documentation

Product documentation is located on Oracle Technology Network:

http://docs.oracle.com

Additional Oracle Communications documentation is available from Oracle E-Delivery:

https://edelivery.oracle.com

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at


Access to Oracle Support

Oracle customers 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.

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E25106-01</td>
<td>March 2013</td>
<td>Initial release.</td>
</tr>
<tr>
<td>Version</td>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td>--------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Updated the &quot;Subscription Management FM Standard Opcodes&quot; section.</td>
</tr>
</tbody>
</table>
This part contains a general overview about upgrading your BRM software.

Part I contains the following chapter:

- About Upgrading BRM Releases
About Upgrading BRM Releases

This document provides general information on how to upgrade your existing system to the latest Oracle Communications Billing and Revenue Management (BRM) release. In this document, the BRM release running on your production system is called the old release. The release you are upgrading to is called the new release. For example, if you are upgrading from BRM 7.3.1 to BRM 7.4, BRM 7.3.1 is the old release, and BRM 7.4 is the new release.

About Upgrading BRM to a New Release

Upgrading to a new release is a four-part process:

1. Plan the upgrade process.
2. Implement and test the upgrade on a test system.
3. Prepare to upgrade your production system.
4. Implement and test the upgrade on the production system.

The upgrade process includes these tasks:

- **Install the 7.4 overlay upgrade patch.**
- **Update the BRM database.** The new BRM release includes an updated database schema with new tables and indexes. You use upgrade scripts to update your BRM database to the new schema.
- **Update the Pipeline Manager database.** The new release includes an updated database schema with new tables and indexes. You use upgrade scripts to update your Pipeline Manager database to the new schema.
- **Reimplement customizations.**
  - Source code for policy opcodes can change in a new release. You must merge your old release customizations into the new policy source code and recompile the policy Foams.
  - To support new functionality, the new software includes new configuration files. You must update those files to include the customizations made to your old system.
  - Other customizations in your system; such as customized invoicing, reports, general ledger reporting, and client applications; might need to be updated to work with the new BRM software.
- **Implement new features.** You can implement new BRM functionality to improve your BRM system. See the information about new features in *BRM Release Notes.*
The basic steps for upgrading are:

1. Back up files.
2. Turn off service authentication and authorization.
3. Shut down the old release.
4. Back up your the old release’s database.
5. Install the 7.4 upgrade overlay patch.
6. Upgrade the BRM database schema.
7. Upgrade the Pipeline Manager database schema.
8. Install BRM 7.4 client applications and optional components.
9. Add customizations.
10. Restore service authentication.

Note: There are additional steps if you use a multidatabase system, and optional steps for loading data.

Direct and Incremental Upgrades

Direct upgrades are performed with a single set of upgrade scripts. This set directly transforms the old database into the new BRM database. BRM 7.4 includes two direct upgrade scripts, which is from Portal 7.3 to BRM 7.4 and BRM 7.3.1 to BRM 7.4.

Incremental upgrades involve multiple sets of upgrade scripts. If you are upgrading to BRM 7.4 from any release earlier than Portal 7.3, you must perform an incremental upgrade. That is, you must first upgrade your database to Portal 7.3, and then upgrade from Portal 7.3 to BRM 7.4. For example, to upgrade from Portal Release 7.0 to BRM 7.4, you first run a set of scripts to upgrade the Portal database from 7.0 to 7.3, and then you run another upgrade script to upgrade the database from 7.3 to BRM 7.4. In this case, Portal 7.3 is called the interim release.

To perform an incremental upgrade to BRM 7.4:

1. Install the Portal 7.3 server software.
2. Run the upgrade scripts to upgrade your database from the previous release to Portal 7.3.
3. Run the Portal 7.3 pin_setup scripts.
4. Install the 7.4 overlay upgrade patch.
5. Run the upgrade script to upgrade your database from BRM 7.3.1 to BRM 7.4.

Note: You perform other upgrade tasks, such as updating policy source code, only in the new release.

Planning your Upgrade

To plan your upgrade, you can perform the following tasks:

1. Identifying Your Upgrade Team
2. Identifying Who is Affected by the Upgrade
3. Collecting Information About Your System
4. Determining the Impact of New Features
5. Estimating How Long the Upgrade Will Take
6. Maintaining Access to Services While Upgrading

Identifying Your Upgrade Team

Your upgrade team should include the following team members:

- A database administrator to manage the database upgrade and tune the database.
- A system administrator to manage the hardware and system architecture.
- A business analyst to make business decisions about changes to your BRM implementation.
- A customer service representative (CSR) supervisor to assess the impact on CSRs and to train CSRs on new client applications.

Identifying Who is Affected by the Upgrade

You should identify who might be affected by the upgrade. For example:

- You might need to give your customers advance notice of any system downtime.
- If your branded service providers use BRM client applications, you should provide training to support new features. In addition, branded service providers might want to tell their customers about possible system downtime.
- Tell your system administrators in advance about any changes to the system architecture.
- Train CSRs on new client application functionality. If a separate staff handles customer management, they need the new client applications. In addition, if there are changes to service functionality, you can tell your CSR staff to expect more service calls than usual.
- If you have any software interfaces to third-party organizations, such as a credit card processor, inform them about anything that might affect your interface.
- Notify Oracle so that we can help you anticipate and avoid problems. Technical support might have additional information about upgrading BRM or information specific to your implementation.

Collecting Information About Your System

When you upgrade, you must know all the customizations you implemented in the old release. To prepare for the upgrade, find or create the following documents:

- **Implementation design documents.** When you first implemented BRM, you should have created documents that explained your business requirements and the customizations you made to meet those requirements. These documents help you create a list of customized components. You can also compare these documents with the documentation on new BRM features to find out whether any of your customizations can now be implemented by using standard BRM functionality.

- **List of customized components.** This should list every file created or modified for the original implementation. You need this list to know which files must be checked against the new release for changes.
Customizations might include the following:
- Additional Data Managers (DMs)
- Custom Facility Modules (FMs)
- Custom client applications
- Custom DLLs
- Custom reports
- Custom iScripts
- Merging container DESC.dsc files
- Updating registry files with new registry entries
- Modified storable classes
- Additional storable classes
- Custom table indexes
- Modified configuration, properties, and INI files
- Custom Web pages
- A gateway service that provides access to a legacy system

**Determining the Impact of New Features**

You might need to make changes to your current system to accommodate new functionality in the new release. For example, if the new release changes how resource rounding works, you might need to modify your price list to support the new rounding method.

See "Upgrading from BRM 7.3.1 to BRM 7.4" for more information.

The following features are typically affected by new releases:
- Price lists (rating)
- Billing and invoicing
- General ledger (G/L IDs)
- Web pages
- BRM reports
- Client applications used by CSRs
- Components that integrate credit card processors and tax software
- Discount balancing

In addition, new features might include default functionality that you implemented as a customization. In that case, it is best to replace your customizations with the new feature.

**Estimating How Long the Upgrade Will Take**

When estimating the time it will take to upgrade, consider the following:
- How Long Will It Take to Run the database Upgrade Scripts?
- How Long Will It Take to Plan, Prepare for, Test, and Perform the Upgrade?
How Long Will It Take to Run the database Upgrade Scripts?
This is an important consideration because services might be suspended and authentication and authorization might be unavailable while you upgrade the database.

The best way to determine how long the database upgrade will take is to run the upgrade scripts on a test system that duplicates the data in your production system (see “Creating Test Environments”). If this is not possible, you can estimate the time by installing and reviewing the upgrade scripts and the upgrade_path_schema_diff.html file included with the upgrade scripts. This shows you which tables are affected by the upgrade. For example, adding columns to a very large EVENT_T table can take a long time.

In general, it takes longer to upgrade large databases with large tables. A large database can take from 8 to 48 hours to upgrade.

Reducing BRM System Downtime by Purging or Archiving Old Data
The upgrade scripts convert your old release data to the new release format. The time required to complete an upgrade is directly proportional to the size of your database. To save time, purge or archive data that is no longer required before you shut down your production system to perform the upgrade.

Because event tables consume most of the space in a database, you can significantly reduce the size of the database by purging unneeded event objects. If you cannot purge event objects, archive those that are no longer needed.

How Long Will It Take to Plan, Prepare for, Test, and Perform the Upgrade?
Depending on the size and complexity of your BRM implementation, the entire upgrade process can take from 2 to 8 months. If your system architecture and customization documentation is complete and up-to-date, the time is significantly shorter.

For help with your upgrade, contact Oracle.

Maintaining Access to Services While Upgrading
When you upgrade your production system, you must shut down BRM. This typically means that BRM cannot perform authentication and accounts cannot be created.

To minimize service outage while you upgrade, follow these tips:

- Upgrade the database during off-peak hours.
- Switch authentication to promiscuous mode. See “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.
- Use custom applications to support authentication for services other than dialup services.
- Use a custom application to register customers over the Web and to store registered accounts, which can be loaded into BRM after the upgrade.

Updating Your System Environment
Before upgrading, prepare your system environment:

- Install the latest releases.
Creating Test Environments

Install the latest BRM-supported release of your operating system and database software. Include the latest patches. If you are not running the latest supported release of Oracle, you might need to upgrade your database software before upgrading BRM. For more information, see the following:

- For a list of hardware and software supported by BRM, see “Hardware and Software Requirements” in BRM Installation Guide.
- For general database information, see “Database Configuration and Tuning” in BRM Installation Guide.

Check disk space and memory.

Make sure your test environments and production system include the disk space and memory required for the new BRM release. The requirements might differ from the requirements for the old release. For more information, see the following:

- For disk space requirements, see “Hardware and Software Requirements” in BRM Installation Guide.
- For information on memory configuration, see “Improving BRM Performance” in BRM System Administrator’s Guide.

Tune your system.

Upgrading is faster and easier if you first tune your system for optimal performance. For assistance with estimating the hardware and storage requirements for your BRM system, contact Oracle for more information.

Creating Test Environments

To test your upgrade, create the environments described in this section. You use these environments to do the following:

- Compare the default behavior of the old and new releases.
- Determine what customizations you made in the old release.
- Test the upgrade process and its results.

Tip:

- You can install multiple BRM instances on a single UNIX machine. See “Installing and Configuring Multiple Instances of BRM on One Machine” in BRM Installation Guide.
- If you install BRM on multiple systems, you can save time by compressing and moving folders and files instead of running the BRM installer on each system. When you copy the files to other systems, you might need to change some configuration file values, such as port numbers, manually if you do not use the automated installer.

Old Baseline Release

Your old baseline release system should run the old BRM release with the latest ServicePak but without any customizations. Use this system to do the following:

- Determine what default behavior in the old release has changed in the new release by comparing the old baseline release with the new baseline release. See “New Baseline Release”.
- Determine what customizations you made in the old release by comparing the old baseline release with your existing system, which this document calls the old customized release. See "Old Customized Release".

Old Customized Release

Your old customized release system should run the old BRM release with your customizations. This system should be identical to your current production system. To ensure that your test upgrade (new customized release (test system)) is working properly, compare the behavior of the new customized release with the old customized release. See "New Customized Release (Test System)" for more information.

New Baseline Release

Your new baseline release system should run the new BRM release without any customizations. Use this system to find out how the latest BRM release works.

New Customized Release (Test System)

Your new customized release (or test) system should run the new BRM release with your customizations and an upgraded BRM database. Use this system to test the following aspects of the upgrade:

- **The upgrade process.** The procedures used to create this system should be as close as possible to the procedures used to upgrade your production system. This ensures that you test such tasks as turning authentication on and off and copying over configuration files.

  For information on the standard procedure for upgrading a production system, see "Upgrading Your Production System".

  **Tip:** To create this system, perform a test upgrade on your Old Customized Release.

- **The upgrade results.** To test the outcome of your upgrade process, run all tests on this system. See "Testing Your Upgraded System".

  **Tip:** This system's database should include the same data as your Old Customized Release database. That way, you can run tests on the same data and compare the results.

Transferring Customizations to the New Release

This section explains how to transfer customizations from the old release to the new release:

- Upgrading Customized Policy Source Files
- Updating Configuration Files
- Updating Database Customizations
- Updating Custom Reports
- Updating Custom Applications
Tip: When you upgrade to a new BRM release, you first install the default BRM server configuration, and you then install your customized files. To make sure you add all of your customized files to the new release, create a package that includes all your customized files.

Upgrading Customized Policy Source Files

New releases often include changes to policy opcodes. If you customized your policy opcodes, you might need to re-create your customizations after you install the new BRM release:

1. See your internal documentation to find out what customizations were made to policy source files. If the customizations were not documented, use a diff tool to compare the source code in the "Old Baseline Release" with the source code in your "Old Customized Release". Source code is stored in the BRM_Home/source folder.

2. When you know what your customizations are, use a diff tool to compare your customized source code with the source code in the "New Baseline Release".

3. Determine whether new features implement any of your customizations or make them irrelevant.

4. Merge the policy source file customizations that you still need into the new release source code. As you do so, find any changes to input and output flists. It is common for fields to change or to change from required to optional (or vice versa).

5. Using the libraries in the new release, recompile your custom code in the new release.

6. Test the new source code by using the functionality that it customizes.

Updating Configuration Files

When you install a new BRM release, you install new configuration files, such as the Connection Manager (CM) pin.conf file. You must update these files to include the customizations you made to them in your old system. For more information, see “Using Configuration Files to Connect and Configure Components” in BRM System Administrator’s Guide.

Updating Database Customizations

If you added custom classes to your old release, corresponding custom tables were added to your BRM database, and corresponding custom definitions were added to your BRM data dictionary. These customizations are not modified by the database upgrade scripts.

Modifying the Content of Custom Tables

Depending on how the new release differs from the old release, you might need to modify the old data in your custom tables to accommodate the new release. For example, a custom table might store phone numbers in the following format: 408-555-1212. Opcodes in the new release, however, might need a different format, such as 1-408-555-1212.
Important: To upgrade the old data to the new format, you should create custom SQL scripts and incorporate them into the upgrade configuration file, upgrade.cfg, before running the database upgrade scripts.

Modifying the Structure of Custom Tables

Depending on the changes introduced by the new release, you might need to modify the structure of your custom database tables. For example, you might need to add, delete, or change the size of a column. To make such changes, use either Developer Center or the pin_deploy utility after running the database upgrade scripts. Those tools will automatically update your new database schema and data dictionary.

Note: To identify undocumented database customizations in your old release, compare the database schema in the "Old Baseline Release" with the database schema in your "Old Customized Release".

Fixing Standard Database Objects with Nonstandard Object IDs

When you run the database upgrade scripts, the scripts overwrite standard database objects. If you deleted standard objects and re-created them with nonstandard object IDs when customizing BRM, the upgrade scripts delete those objects.

To drop a standard object from the upgraded database and re-create the object with a nonstandard ID, use the testnap create 1 poid command. This command enables you to use the POID in the input file to re-create the object instead of using a value from the POID sequence.

Updating Custom Reports

Since BRM reports read data stored in objects, changes to the database schema often require changes to reports. Sometimes it is easier to design new reports to work with the new database schema than to update old reports, especially when there are large-scale schema changes.

For more information, see “About BRM Reports” in BRM Reports.

Updating Custom Applications

Use your "New Customized Release (Test System)" to test all custom applications that call opcodes or manipulate data in the database. Changes to storable classes and opcodes in the new release might make such applications function differently.

Note: Event objects created before release 6.7 do not have a sub-balance array. You might need to take this into consideration when designing your BRM application.

Important: You must recompile your custom applications with the new BRM libraries.
Testing Your Upgraded System

To test your "New Customized Release (Test System)”, perform the tests listed in "Testing Checklist". When testing, cover all aspects of the system, including CSR activity, customer logins and service usage, and billing.

*Tip:* Create an upgrade process document that includes a checklist of the upgrade tasks. Part of your test is to make sure the checklist is complete, since you will use it when upgrading your production system.

When you have completed all your tests without finding any errors, run all the tests again, *twice*. You should run through the tests twice without error before considering the test cycle complete.

If you find any problems that indicate a BRM problem, submit it to Oracle.

---

Important: Document all customizations you make during the upgrade. You will need to know about them the next time you upgrade.

---

Running Old and New Versions in Parallel

A good way to test your upgraded BRM implementation is to run the old release and the new release in parallel. To do so, run the old system as your production system, and import all your data into the new system. You can then run billing and perform other tasks on both systems and compare the results.

Testing the BRM Database

When you install a new BRM release, you run upgrade scripts to update the database schema. The scripts update the database tables and fields, including the BRM database definition. The scripts modify only default BRM objects and do not affect custom objects.

You should load actual production data into the test environment to run the database upgrade scripts with your real information. If you do not have enough hardware to load the entire database, include at least some account information.

When running the upgrade scripts on your test system, look for the following:

- Data errors in your current database
- Custom tables and fields that are not being used

*Important:* If you are performing an incremental upgrade, you must run database upgrade scripts for each incremental release. For more information, see “Direct and Incremental Upgrades”.

---

Troubleshooting Your Upgraded System

For information about BRM error messages and other problems that you encounter in your upgraded system, see the following documents:


Upgrading BRM can expose implementation problems. While running tests, some of the problems you find might be caused in part by the following:

- **Missing data.** If your initial BRM implementation included the conversion and migration of legacy data, the conversion might not have created all necessary objects or fully populated all fields. In addition, data is sometimes mistakenly deleted. The missing data might not affect the existing BRM implementation, but later versions of BRM might need it.

- **Undocumented customizations.** If you find what appears to be an undocumented customization, compare the "Old Baseline Release" with your "Old Customized Release". If you find an undocumented customization, be sure to document it!

- **New functionality.** BRM functionality changes between releases. These changes might enable or require you to get rid of or change some of your customizations.

  For information about how new functionality affects your system, see "Upgrading from BRM 7.3.1 to BRM 7.4".

### Testing Checklist

You should have a list of tests that were performed during your initial BRM and Pipeline Manager implementation. In addition to running all those tests, you might run new tests to cover new functionality.

---

**Important:** Before running tests in a *production* environment, make sure that all entries for the `pin_virtual_time` utility have been removed from configuration files. If you are running in a *test* environment, it is not necessary to remove entries for the `pin_virtual_time` utility.

---

These are the basic tests you should perform on your test system:

- Create accounts using the client applications and your Web interface.
- Run billing, including requesting and receiving payments. Check all log files and invoices after running billing.
- Run the `/pin_ledger_report` utility on your "Old Customized Release" and your test system, and compare the results. If the database on both systems includes the same data, the results should be the same.

---

**Note:** New functionality, such as a change in how end times are computed, can produce different results.

---

- Run all the client applications that your implementation uses.
- Test your price list by committing it to the database and purchasing every plan and deal.
- Test all your optional components, such as RADIUS Manager, LDAP Manager, and GSM Manager. If you plan to turn off authentication and authorization when you upgrade the database, test RADIUS Manager in promiscuous mode. See "Maintaining Access to Services While Upgrading".
- Test credit card processing, including a live connection to the credit card processor.
Preparing for the Production System Upgrade

Before you upgrade your production system, do the following:

- Make a backup of the data in your production system.

  **Caution:** Do not begin your upgrade until you have backed up your production system.

- Make sure all files required for customizing the system are available and ready to be copied to the upgraded system. This might include configuration files and Facility Modules (FMs). Test the procedure for copying these files to the upgraded system.

- Be prepared to run a full integration test on your production system after the upgrade scripts have run. Prepare any test scripts and test them before shutting down BRM.

- Inform anyone who needs to know about the upgrade. See "Identifying Who is Affected by the Upgrade".

- Create a checklist for the upgrade procedure. (You should have created one while testing the upgrade. See "Testing Checklist".

- Prepare a production staging system. This system includes the "New Baseline Release" with your customized files. You build this system after testing is complete. It serves as a clean system from which to copy files to your production system. To avoid resource contention, run this system on its own dedicated hardware to simulate production performance more accurately. If you have
limited resources, you can use your "New Customized Release (Test System)"
system as the production staging system.

Upgrading Your Production System

The procedures used to upgrade your production system should be almost identical to
the procedures used to create your "New Customized Release (Test System)".

To upgrade your production system from Portal 7.3 to BRM 7.4, see "Upgrading from Portal 7.3 to BRM 7.4".

To upgrade your production system from BRM 7.3.1 to BRM 7.4, see "Upgrading from BRM 7.3.1 to BRM 7.4".
Part II
Upgrade Impacts

This part contains information on the impacts of upgrades from one release to another for different versions of the BRM software.

Part II contains the following chapters:

- Feature changes from BRM 7.3.1 to BRM 7.4
- Storable Class Changes from BRM 7.3.1 to BRM 7.4
- Opcode Changes from BRM 7.3.1 to BRM 7.4
- Utility Changes from BRM 7.3.1 to BRM 7.4
- Pipeline Manager Changes from BRM 7.3.1 to BRM 7.4
- Notification Event Changes from Portal 7.3.1 to BRM 7.4
- Storable Class Changes from Portal 7.3 to BRM 7.3.1
- Feature Changes from Portal 7.3 to BRM 7.3.1
- Notification Event Changes from Portal 7.3 to BRM 7.3.1
- Opcode Changes from Portal 7.3 to BRM 7.3.1
- Pipeline Manager Changes from Portal 7.3 to BRM 7.3.1
- Utility Changes from Portal 7.3 to BRM 7.3.1
This document provides upgrade impact information for Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1 to BRM 7.4. It describes the feature changes that affect your BRM system and what you need to consider when you upgrade from 7.3.1 to 7.4.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

AAA Gateway Manager

The following are the changes made to AAA Gateway Manager.

Diameter changes

Previously, the AAA Gateway Manager supported Diameter GSM service requests by calling the GSM AAA opcodes. It now supports GSM services by calling the Services Framework AAA opcodes (TCF AAA opcodes). As a result, the Diameter grammar file has been changed to map Diameter requests to TCF AAA opcodes.

GSM-specific information is now passed to the opcode input flist in the PIN_FLD_GSM_INFO field under the PIN_FLD_EXTENDED_INFO substruct.

To support other services (for example, GPRS), you define the service type, /service/telco/gprs, and add the PIN_FLD_GPRS_INFO field under the PIN_FLD_EXTENDED_INFO substruct in the input grammar.

Additionally, Credit-Control-Request event messages have been modified to support Service Price Enquiry and Balance Check messages.

Billing

The following are the changes made to billing.

Accounting type set at bill unit level

You can now set the accounting type at the bill unit level. This enables accounts with multiple bill units to have different settings for each bill. For example, an account with two bill units can have one bill unit with an open item accounting type and another bill unit with a balance forward accounting type.

**Note:** Child bill units must have the same accounting type as their parent bill unit.
In previous releases, the accounting type was set at the account level.

For information, see "About accounting types" in BRM Configuring and Running Billing.

GSM AAA standard opcodes

Previously, the AAA Gateway Manager supported GSM service requests by calling the GSM AAA opcodes. It now supports GSM services by calling the Services Framework AAA opcodes (TCF AAA opcodes).

**Important:** These opcodes will become obsolete in a future release. Any enhancements or bug fixes will be made to the TCF AAA opcodes. If you are using GSM AAA opcodes, you should use the TCF AAA opcodes instead.

<table>
<thead>
<tr>
<th>GSM AAA opcode</th>
<th>Replacement TCF AAA opcode</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCM_OP_GSM_AAA_AUTHORIZE</td>
<td>PCM_OP_TCF_AAA_AUTHORIZE</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_UPDATE_ACCOUNTING</td>
<td>PCM_OP_TCF_AAA_UPDATE_ACCOUNTING</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_REAUTHORIZE</td>
<td>PCM_OP_TCF_AAA_REAUTHORIZE</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_UPDATE_AND_REAUTHORIZE</td>
<td>PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_AUTHORIZE</td>
<td>PCM_OP_TCF_AAA_AUTHORIZE</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_CANCEL_AUTHORIZATION</td>
<td>PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_START_ACCOUNTING</td>
<td>PCM_OP_TCF_AAA_START_ACCOUNTING</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_STOP_ACCOUNTING</td>
<td>PCM_OP_TCF_AAA_STOP_ACCOUNTING</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_ACCOUNTING_ON</td>
<td>PCM_OP_TCF_AAA_ACCOUNTING_ON</td>
</tr>
<tr>
<td>PCM_OP_GSM_AAA_ACCOUNTING_OFF</td>
<td>PCM_OP_TCF_AAA_ACCOUNTING_OFF</td>
</tr>
</tbody>
</table>

Pricing

The following are the changes made to Pricing.

LoadIfwConfig enhancements

In previous releases, the LoadIfwConfig utility was used primarily to migrate price list data from a legacy database to the Pipeline Manager database. The utility has been enhanced to also transfer data from one Pipeline Manager database to another, such as from a test database to a production database.

**Caution:** The enhanced LoadIfwConfig utility is not backwards compatible with previous versions of the utility. Any data exported by a previous version of the utility must also be loaded with that same version. In addition, any custom scripts or procedures that are dependent on the utility’s functionality might need to be modified to work with the new version.
To support transferring data between Pipeline Manager databases, the utility now:

- Supports regular expressions for field values.
- Avoids redundant database fetches by looking up data in the cache first.
- Retrieves data from dependent tables.
- Updates lower-level objects that do not have a CODE column.
- Loads data from multiple databases into the Pipeline Manager database.
- Includes an option for dumping all pipeline data into an XML file.
- Supports all pipeline registry settings in all operation modes.
- Allows you to specify the number of rows retrieved on each trip to the database.
- Handles larger input files.
- Provides more descriptive error messages.
- Consolidates schema definition and mapping information into one XSD file.

For more information, see "Transferring data between Pipeline Manager databases" in BRM Configuring Pipeline Rating and Discounting.

**RADIUS Manager**

The following are the changes made to RADIUS Manager.

**RADIUS configuration file changes**

The RADIUS configuration file (BRM_home/apps/radius/config) has been modified to include configuration of the new RADIUS dictionary file (dictionary-RFC2865) and configuration of the new RADIUS module, mod_unit.

For more information on the RADIUS Manager enhancements, see the information about new features in BRM Release Notes.

**Roaming Manager**

Previously, the input grammar description files for TAP3.11 and RAP contained syntax checking and other types of validations as well as the mapping of input data to the EDR container. The new input grammar files do not contain any syntax or validation checks. The new input grammar files map TAP3.11 and RAP input data to staging fields in the EDR container. New input mapping iScripts have been created to copy data from staging fields to the business fields in the EDR container. All the validations are now done using new validation iScripts.

Additionally, a new generic block description file has been created. The generic block description file is used together with the TAP3.11 and RAP block description files to form complete block descriptions.

**Important:** To configure roaming using the new grammar files and mapping and validation iScripts, see "Setting up Pipeline Manager for roaming incollect processing" in BRM Configuring Roaming in Pipeline Manager and "Setting up Pipeline Manager for roaming outcollect processing" in BRM Configuring Roaming in Pipeline Manager.
The following table lists the new description, validation, and iScript files:

<table>
<thead>
<tr>
<th>File name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GenericBlock.dsc</td>
<td>Generic block descriptions.</td>
</tr>
<tr>
<td>TAP_0311_Blocks.dsc</td>
<td>Block descriptions for TAP3.11.</td>
</tr>
<tr>
<td>TAP_0311_InGrammar.dsc</td>
<td>Maps TAP3.11 input data to staging fields in the EDR container.</td>
</tr>
<tr>
<td>ISC_TAP_0311_Validations.isc</td>
<td>Performs validation of TAP3.11 input data</td>
</tr>
<tr>
<td>ISC_TAP_0311_InMap.isc</td>
<td>Maps TAP3.11 data in the staging fields to business fields in the EDR container.</td>
</tr>
<tr>
<td>RAP_0103_Blocks.dsc</td>
<td>Block description for RAP.</td>
</tr>
<tr>
<td>RAP_0103_AckOutGrammar.dsc</td>
<td>Output grammar for RAP acknowledgment.</td>
</tr>
<tr>
<td>RAP_0103_InGrammar.dsc</td>
<td>Maps TAP3.11 input data to staging fields in the EDR container.</td>
</tr>
<tr>
<td>RAP_0103_OutGrammar.dsc</td>
<td>Output grammar for RAP.</td>
</tr>
<tr>
<td>RAP_0103_MissingReturn.dsc</td>
<td>Grammar for RAP missing return used by RAP_0103_OutGrammar.dsc.</td>
</tr>
<tr>
<td>RAP_0103_FatalReturn.dsc</td>
<td>Grammar for RAP fatal return used by RAP_0103_OutGrammar.dsc.</td>
</tr>
<tr>
<td>ISC_RAP_0103_InMap.isc</td>
<td>Maps TAP3.11 data in the staging fields to business fields in the EDR container.</td>
</tr>
</tbody>
</table>

**Services Framework**

The following are the changes made to Services Framework.

**Services Framework now supports non-telco services**

You use Services Framework to collect data about customers; manage and provision services; and process authentication, authorization, and accounting (AAA) requests. In previous releases, Services Framework performed these functions for telco services only. Services Framework now allows non-telco services to leverage Services Framework’s functionalities, transforming it into a service management framework for any service type.

This enhancement affects the following:

- Provisioning. See "About provisioning non-telco services".
- Service management. See “About managing non-telco services”.
- AAA. See "About processing AAA requests for non-telco services”.

**About provisioning non-telco services**

Services Framework provisioning has been enhanced to support non-telco service and event types. To support non-telco service types, Services Framework provisioning includes these changes:

- Previously, Services Framework provisioned telco services (/service/telco/*) only and ignored all other service types. Services Framework now also provisions any non-telco service type that is listed in the new /config/service_framework/permitted_service_types object. It also determines the provisioning configuration object to use for non-telco services by reading the /config/service_framework/permitted_service_types object. See “Specifying the non-telco services supported by Services Framework” in BRM Telco Integration.
Services Framework can now provision service orders in Confirmed mode, in addition to the already supported Queued mode. See "About provisioning modes" in BRM Telco Integration.

For more information, see "About provisioning services" in BRM Telco Integration.

About managing non-telco services
Previously, Services Framework managed telco services (/service/telco/*) only and ignored all other service types. Services Framework now also manages any non-telco service type that is listed in the /config/service_framework/permitted_service_types object. It also determines the provisioning configuration object to use for non-telco services by reading the /config/service_framework/permitted_service_types object.

For more information, see "About managing prepaid services and extended rating attributes" in BRM Telco Integration.

About processing AAA requests for non-telco services
To support non-telco services, Services Framework AAA Manager includes these changes:

- The Services Framework AAA opcodes now check the service type passed in the input flist and create the PIN_FLD_TELCO_INFO substruct only if the service type passed in the input flist is a telco service (/service/telco/*).

- The duplicate check criteria for non-telco services is different than that for telco services:
  - For non-telco services, the PCM_OP_TCF_AAA_SEARCH_SESSION helper opcode searches for sessions based on the authorization ID.
  - For telco services, the PCM_OP_TCF_AAA_SEARCH_SESSION helper opcode searches for sessions based on both the authorization ID and the network correlation ID.

- Previously, Services Framework AAA Manager checked for duplicate authentication and authorization requests only and did not check for duplicate requests for other AAA actions, such as reauthorization, update accounting, and stop accounting. Services Framework AAA now checks for any duplicate AAA request.

For more information, see "About performing AAA for prepaid services" in BRM Telco Integration.

System Administration
The following are the changes made to System Administration.

MD5 password encryption no longer supported
BRM no longer supports MD5 encryption for passwords. The default BRM password encryption method is now AES.
This document provides upgrade impacts information for Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1 to BRM 7.4. It describes the storable class changes that affect your BRM system, and what you need to consider when you upgrade from 7.3.1 to 7.4. It also provides information about storable class index and schema changes.

See "About Upgrading BRM Releases" for information on planning your upgrade implementation, such as setting up your development and test environments.

### Changed Storable Classes

**Table 3–1** lists all storable classes that were changed between BRM 7.3.1 and BRM 7.4.

<table>
<thead>
<tr>
<th>Changed Storable Class</th>
<th>Description</th>
</tr>
</thead>
</table>
| /account               | The following field was removed:  
|                        | ■ PIN_FLD_ACTG_TYPE  
|                        | The following fields were changed:  
|                        | ■ PIN_FLD_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.  
|                        | ■ PIN_FLD_NEXT_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters. |
| /billinfo              | The following fields were added:  
|                        | ■ PIN_FLD_ACTG_TYPE - The bill unit's accounting type: open item accounting (1) or cycle forward accounting (2).  
|                        | ■ PIN_FLD_ASSOC_BUS_PROFILE_OBJ_LIST - A link to the `/associated_bus_profile` object that includes the business profile object for Invoice.  
|                        | The following fields were changed:  
|                        | ■ PIN_FLD_EVENT_POID_LIST - The length of this field was changed from 2000 to 4000 characters.  
|                        | ■ PIN_FLD_BAL_GRP_OBJ is now auditable. |
### Table 3–1 (Cont.) Changed Storable Classes in BRM 7.4

<table>
<thead>
<tr>
<th>Changed Storable Class</th>
<th>Description</th>
</tr>
</thead>
</table>
| /config/credit_profile | The following field was added to the PIN_FLD_PROFILES array:  
- PIN_FLD_CREDIT_THRESHOLDS_FIXED - A list of fixed credit threshold values, in ascending order. BRM generates notification events when a customer's balance crosses above or below the fixed threshold value. |
| /discount              | The following field was added:  
- PIN_FLD_CODE - The discount's unique code. |
| /event                 | The following field was added:  
- PIN_FLD_NAP_IP_ADDRESS - IP Address of the client machine. |
| /event/audit/service_balgrp_transfer | The following fields were changed:  
- PIN_FLD_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.  
- PIN_FLD_NEXT_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters. |
| /event/audit/subscription | The following fields were changed:  
- PIN_FLD_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.  
- PIN_FLD_NEXT_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters. |
| /event/billing/charge/cc | The following field was removed from the PIN_FLD_CC_INFO array:  
- PIN_FLD_SECURITY_ID |
| /event/billing/limit   | The following field was added to the PIN_FLD_LIMIT array:  
- PIN_FLD_CREDIT_THRESHOLDS_FIXED - A list of fixed credit threshold values, in ascending order. BRM generates notification events when a customer's balance crosses above or below the fixed threshold value. |
| /event/billing/validate/cc | The following field was removed from the PIN_FLD_CC_INFO array:  
- PIN_FLD_SECURITY_ID |
| /event/customer/billinfo | The following field was added:  
- PIN_FLD_BAL_GRP_OBJ |
| /invoice               | The following fields were added:  
- PIN_FLD_STATUS - The status of the Invoice object with respect to the fact whether the Final Invoice Document has been generated or not. Values: (1) Pending, or (2) Generated, or (4) Regenerated.  
- PIN_FLD_BILLINFO_OBJ - Link to the /billinfo object for this Invoice object is created.  
- PIN_FLD_REPORT_NAME - Link to the BIP Report Name configured in the report name of Invoicing Business Profile pointed by the billinfo whose invoice is generated.  
- PIN_FLD_TEMPLATE_NAME - Link to the template name configured in the template name of Invoicing Business Profile pointed by the billinfo whose invoice is generated. |
## Changed Storable Classes

### 3–3

<table>
<thead>
<tr>
<th>Changed Storable Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/item</td>
<td>The following field was changed:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_EVENT_POID_LIST -The length of this field was changed from 2000 to 4000 characters.</td>
</tr>
<tr>
<td>/payinfo/cc</td>
<td>The following field was removed from the PIN_FLD_CC_INFO array:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_SECURITY_ID</td>
</tr>
<tr>
<td>/plan</td>
<td>The following field was added to the PIN_FLD_LIMIT array:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_THRESHOLDS_FIXED - A list of fixed credit threshold values, in ascending order. BRM generates notification events when a customer's balance crosses above or below the fixed threshold value.</td>
</tr>
<tr>
<td></td>
<td>The following field was added to the PIN_FLD_LIMIT array under the PIN_FLD_BAL_INFO array:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_THRESHOLDS_FIXED - A list of fixed credit threshold values, in ascending order. BRM generates notification events when a customer's balance crosses above or below the fixed threshold value.</td>
</tr>
<tr>
<td>/process_audit/export_gl</td>
<td>The following field was changed:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_GL_REPORT_POID_LIST - The length of this field was changed from 255 to 4000 characters.</td>
</tr>
<tr>
<td>/product</td>
<td>The following field was added:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CODE - The product's unique code.</td>
</tr>
<tr>
<td>/service</td>
<td>The following fields were added to the PIN_FLD_TRANSFER_LIST array:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_BAL_GRP_OBJ - The /balance_group object from which the line service is transferred.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_BILLINFO_OBJ - The /billinfo object from which the line service is transferred.</td>
</tr>
<tr>
<td></td>
<td>The following fields were changed:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_NEXT_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.</td>
</tr>
<tr>
<td></td>
<td>The following fields under PIN_FLD_TRANSFER_LIST array were changed:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_NEXT_ITEM_POID_LIST - The length of this field was changed from 2000 to 4000 characters.</td>
</tr>
<tr>
<td>/service/admin_client</td>
<td>The following fields were added:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOCK_INFO - A substruct containing two new fields:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOGIN_ATTEMPTS - The number of incorrect login attempts.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOCK_STATUS - The status of the login service. 1=Service locked, 0=normal.</td>
</tr>
</tbody>
</table>
Table 3–2  Obsoleted Storable Classes in BRM 7.4

<table>
<thead>
<tr>
<th>Removed Storable Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/config/gprs</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/gsmtags</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/gsmtags/data</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/gsmtags/fax</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/gsmtags/sms</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/gsmtags/telephony</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/license</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/link_batchstat</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/config/pin_archive</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/data/archive</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/event/activity/sms</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/event/session/call</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/service/ip/gprs</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/service/ip/cable</td>
<td>Obsolete</td>
</tr>
<tr>
<td>/service/sms</td>
<td>Obsolete</td>
</tr>
</tbody>
</table>

Table 3–1 (Cont.) Changed Storable Classes in BRM 7.4

<table>
<thead>
<tr>
<th>Changed Storable Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/service/pcm_client</td>
<td>The following fields were added:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOCK_INFO -A substruct containing two new fields:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOGIN_ATTEMPTS -The number of incorrect login attempts.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_LOCK_STATUS -The status of the login service. 1=Service locked, 0=normal.</td>
</tr>
<tr>
<td>/sponsorship</td>
<td>NA</td>
</tr>
</tbody>
</table>
opcode changes from brm 7.3.1 to brm 7.4

this document describes the opcode changes that affect your oracle communications billing and revenue management (brm) system and what you need to consider when you upgrade from 7.3.1 to 7.4.

see "about upgrading brm releases" for information on planning your upgrade implementation, such as setting up your development and test environments.

changed policy opcodes

the following policy opcodes were changed between brm 7.3.1 and brm 7.4.

- activity fm policy opcodes
- billing fm policy opcodes
- content manager fm policy opcodes
- customer fm policy opcodes
- gprs manager 3.0 fm policy opcodes
- gsm aaa manager fm helper policy opcodes
- gsm manager fm policy opcodes
- imt manager fm policy opcodes
- ip address manager fm policy opcodes
- payment fm policy opcodes
- price list fm policy opcodes
- process audit fm policy opcodes
- provisioning fm policy opcodes
- rating fm policy opcodes
- radius manager fm policy opcodes
- resource reservation fm policy opcodes
- services framework manager fm policy opcodes
- subscription management fm policy opcodes
- voucher management fm policy opcodes
Activity FM Policy Opcodes

The following are the changes made to Activity FM policy opcodes in BRM 7.4.

**PCM_OP_ACT_POL_SPEC_EVENT_CACHE**

New output fields

- PIN_FLD_BAL_IMPACTS array:
  - PIN_FLD_IMPACT_TYPE.
  - PIN_FLD_TAX_CODE.

**PCM_OP_ACT_POL_SPEC_GLID**

Changed to fetch the correct GLID value.

New input fields

- PIN_FLD_EVENT_MISCDETAILS array.

Billing FM Policy Opcodes

The following are the changes made to billing FM policy opcodes in BRM 7.4.

**PCM_OP_BILL_POL_GET_EVENT_SPECIFICDETAILS**

Changed output fields

- PIN_FLD_BYTES_IN integer is now PIN_FLD_BYTES_DOWNLINK decimal field.
- PIN_FLD_BYTES_OUT integer is now PIN_FLD_BYTES_UPLINK decimal field.

**PCM_OP_BILL_POL_GET_PENDING_ITEMS**

New output fields

- PIN_FLD_RESULTS array:
  - PIN_FLD_WRITEOFF.

**PCM_OP_BILL_POL_VALID_WRITEOFF**

New input fields

- PIN_FLD_ITEMS array.

Content Manager FM Policy Opcodes

The following are the changes made to content manager FM policy opcodes in BRM 7.4.

**PCM_OP_CONTENT_POL_ACCOUNTING**

New input fields

- PIN_FLD_BAL_IMPACTS array.

Customer FM Policy Opcodes

The following are the changes made to customer FM policy opcodes in BRM 7.4.

**PCM_OP_CUST_POL_GET_PLANS**

Changed to support the following feature:
■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About Credit Thresholds and Credit Floors" in BRM Setting Up Pricing and Rating.

New output fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_POL_POST_COMMIT**
Changed to support the following feature:
■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About Credit Thresholds and Credit Floors" in BRM Setting Up Pricing and Rating.

New input fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_POL_PRE_COMMIT**
Changed to support the following feature:
■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About Credit Thresholds and Credit Floors" in BRM Setting Up Pricing and Rating.

New input fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_POL_PREP_ACCTINFO**
Changed to support the following feature:
■ Supporting the accounting type at the bill unit level. See "About Accounting Types" in BRM Configuring and Running Billing.

Removed input fields
■ PIN_FLD_ACTG_TYPE from the PIN_FLD_ACCTINFO array.

Removed output fields
■ PIN_FLD_ACTG_TYPE from the PIN_FLD_ACCTINFO array.

**PCM_OP_CUST_POL_PREP_BILLINFO**
Changed to support the following feature:
■ Supporting the accounting type at the bill unit level. See "About Accounting Types" in BRM Configuring and Running Billing.

New input fields
■ PIN_FLD_BILLINFO array.
  – PIN_FLD_ACTG_TYPE.

New output fields
■ PIN_FLD_BILLINFO array.
  – PIN_FLD_ACTG_TYPE.
**PCM_OP_CUST_POL_PREP_LIMIT**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**New output fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_POL_PREP_PAYINFO**

**New input fields**

- PIN_FLD_FLAGS.

**PCM_OP_CUST_POL_PREP_TOPUP**

**New input fields**

- PIN_FLD_TOPUP_INFO array.
  - PIN_FLD_ACCOUNT_OBJ.
  - PIN_FLD_GROUP_TOPUP_INFO array:
    - PIN_FLD_PARENT.

**Changed input fields**

- PIN_FLD_PARENT was moved from the PIN_FLD_GROUP_TOPUP_INFO array into the PIN_FLD_TOPUP_INFO array.
- PIN_FLD_TOPUP_AMT in the PIN_FLD_TOPUP_INFO array is now optional.

**New output fields**

- PIN_FLD_TOPUP_INFO array.
  - PIN_FLD_ACCOUNT_OBJ.

**Changed output fields**

- PIN_FLD_PARENT was moved from the PIN_FLD_GROUP_TOPUP_INFO array into the PIN_FLD_TOPUP_INFO array.
- PIN_FLD_TOPUP_AMT in the PIN_FLD_TOPUP_INFO array is now optional.

**PCM_OP_CUST_POL_READ_PLAN**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

**New output fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
PCM_OP_CUST_POL_TRANSITION_PLANS
Changed to support the following feature:

■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

New output fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

PCM_OP_CUST_POL_VALID_ACCTINFO
Changed to support the following feature:

■ Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.

Removed input fields
■ PIN_FLD_ACTG_TYPE from the PIN_FLD_ACCTINFO array.

PCM_OP_CUST_POL_VALID_BILLINFO
Changed to support the following feature:

■ Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.

New input fields
■ PIN_FLD_BILLINFO array.
  – PIN_FLD_ACTG_TYPE.

PCM_OP_CUST_POL_VALID_LIMIT
Changed to support the following feature:

■ Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.

■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

New input fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

PCM_OP_CUST_POL_VALID_NAMEINFO
New input fields
■ PIN_FLD_NAMEINFO array.
  – PIN_FLD_FLAGS.

PCM_OP_CUST_POL_VALID_TOPUP
New input fields
PIN_FLD_TOPUP_INFO array:
■ PIN_FLD_ACCOUNT_OBJ.
■ PIN_FLD_GROUP_TOPUP_INFO array:
Changed Policy Opcodes

GPRS Manager 3.0 FM Policy Opcodes

The following are the changes made to GPRS Manager 3.0 FM policy opcodes in BRM 7.4.

**PCM_OP_GPRS_POL_APPLY_PARAMETER**

**Removed input fields**

PIN_FLD_PRODUCTS array:

- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**Removed output fields**

PIN_FLD_PRODUCTS array:

- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

GSM AAA Manager FM Helper Policy Opcodes

The following are the changes made to GSM AAA Manager FM Helper policy opcodes in BRM 7.4.

**PCM_OP_GSM_AAA_POL_POST_PROCESS**

**New input fields**

- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.
- PIN_FLD_BALANCES array.

**New output fields**

- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.

**Removed output fields**

- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.

GSM Manager FM Policy Opcodes

The following are the changes made to GSM Manager FM policy opcodes in BRM 7.4.

**PCM_OP_GSM_POL_APPLY_PARAMETER**

**Removed input fields**
PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**Removed output fields**

PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

### IMT Manager FM Policy Opcodes

The following are the changes made to IMT Manager FM policy opcodes in BRM 7.4.

**PCM_OP_IMT_POL_APPLY_PARAMETER**

**Removed input fields**

PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**Removed output fields**

PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**PCM_OP_PDC_POL_APPLY_PARAMETER**

**Removed input fields**

PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**Removed output fields**

PIN_FLD_PRODUCTS array:
- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

### IP Address Manager FM Policy Opcodes

The following are the changes made to IP Address Manager FM policy opcodes in BRM 7.4.

**PCM_OP_IP POL DEVICE CREATE**

Changed to support the following feature:
- Performing duplicate search for a range of IP devices or individual IP device while creating a range of IP devices.

**New input fields**

- PIN_FLD_DEVICE_IP substruct.
Payment FM Policy Opcodes

The following are the changes made to Payment FM policy opcodes in BRM 7.4.

**PCM_OP_PYMT_POL_PURCHASE_DEAL**

New input fields
- PIN_FLD_TOPUP_RESOURCE_INFO substruct:
  - PIN_FLD_SUB_BAL_IMPACTS array.

New output fields
- PIN_FLD_SUB_BAL_IMPACTS array.
- PIN_FLD_TAX_JURISDICTIONS array.

**PCM_OP_PYMT_POL_VALID_VOUCHER**

New output fields
- PIN_FLD_TOPUP_RESOURCE_INFO substruct:
  - PIN_FLD_SUB_BAL_IMPACTS array.
  - PIN_FLD_TAX_JURISDICTIONS array.

Price List FM Policy Opcodes

The following are the changes made to Price List FM policy opcodes in BRM 7.4.

**PCM_OP_PRICE_POL_PREP_DISCOUNT**

New input fields
- PIN_FLD_CODE.

New output fields
- PIN_FLD_CODE.

**PCM_OP_PRICE_POL_PREP_PRODUCT**

New input fields
- PIN_FLD_CODE.
- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR.

Changed input fields
- PIN_FLD_PIPELINE_RATEPLANS array was moved out of the PIN_FLD_RATE_PLANS array.

Removed input fields
- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR_TREE substruct.

New output fields
- PIN_FLD_RATE_PLAN_SELECTOR substruct:
Changed Policy Opcodes

Opcode Changes from BRM 7.3.1 to BRM 7.4

4-9

– PIN_FLD_CODE.

Changed output fields

■ PIN_FLD_PIPELINE_RATEPLANS array was moved out of the PIN_FLD_RATE_PLANS array.

Removed output fields

■ PIN_FLD_RATE_PLAN_SELECTOR substruct:
  – PIN_FLD_SELECTOR_TREE substruct.

**PCM_OP_PRICE_POL_VALID_DISCOUNT**

New input fields

■ PIN_FLD_CODE.

**PCM_OP_PRICE_POL_VALID_PRODUCT**

New input fields

■ PIN_FLD_CODE.

■ PIN_FLD_RATE_PLAN_SELECTOR substruct:
  – PIN_FLD_SELECTOR.

Changed input fields

■ PIN_FLD_PIPELINE_RATEPLANS array was moved out of the PIN_FLD_RATE_PLANS array.

Removed input fields

■ PIN_FLD_RATE_PLAN_SELECTOR substruct:
  – PIN_FLD_SELECTOR_TREE substruct.

Process Audit FM Policy Opcodes

The following are the changes made to Process Audit FM policy opcodes in BRM 7.4.

**PCM_OP_PROCESS_AUDIT_POL_CREATE**

Removed input fields

■ PIN_FLD_FAILED_ACCOUNTS array:
  – PIN_FLD_FAILED_ACCOUNT_OBJ.
  – PIN_FLD_FAILED_BILL_OBJ.
  – PIN_FLD_FAILED_ERROR_CODE.

Removed output fields

■ PIN_FLD_FAILED_ACCOUNTS array:
  – PIN_FLD_FAILED_ACCOUNT_OBJ.
  – PIN_FLD_FAILED_BILL_OBJ.
  – PIN_FLD_FAILED_ERROR_CODE.

Provisioning FM Policy Opcodes

The following are the changes made to Provisioning FM policy opcodes in BRM 7.4.
**PCM_OP_PROV_POL_UPDATE_SVC_ORDER**

**New input fields**
- PIN_FLD_EXTENDED_INFO substruct:
  - PIN_FLD_PARAMS array.

**New output fields**
- PIN_FLD_EXTENDED_INFO substruct:
  - PIN_FLD_PARAMS array.

**Rating FM Policy Opcodes**

The following are the changes made to Rating FM policy opcodes in BRM 7.4.

**PCM_OP_RATE_POL_POST_TAX**

**New input fields**
- PIN_FLD_EVENT_OBJ.
- PIN_FLD_TAXES array:
  - PIN_FLD_FIELD_NAMES array.
- PIN_FLD_SUBTOTAL array:
  - PIN_FLD_FIELD_NAMES array.

**New output fields**
- PIN_FLD_EVENT_OBJ.

**PCM_OP_RATE_POL_PRE_TAX**

Changed to support the customization of Vertex Q Series. See “Customizing Vertex Communications Tax Q Series to provide custom input tax data” in BRM Calculating Taxes.

**New input fields**
- PIN_FLD_EVENT_OBJ.
- PIN_FLD_ACCOUNT_NO.
- PIN_FLD_START_T.
- PIN_FLD_END_T.
- PIN_FLD_CURRENCY.
- PIN_FLD_CURRENCY_NAME.
- PIN_FLD_EXEMPTIONS array.
- PIN_FLD_TAXES array:
  - PIN_FLD_TAX_CODE.
  - PIN_FLD_GL_ID.
  - PIN_FLD_AMOUNT_TAXED.
  - PIN_FLD_COMMAND.
  - PIN_FLD_INTERNATIONAL_IND.
  - PIN_FLD_SERVICE_TYPE.
- PIN_FLD_TAXCODE_MAP.
- PIN_FLD_COUNT.
- PIN_FLD_ELAPSED_TIME.

■ PIN_FLD_TAX_SUPPLIER.
■ PIN_FLD_NAME.
■ PIN_FLD_LOCATION.
■ PIN_FLD_VAT_CERT.
■ PIN_FLD_VATINFO array.
■ PIN_FLD_RESIDENCE_FLAG.
■ PIN_FLD_INCORPORATED_FLAG.
■ PIN_FLD_REGULATED_FLAG.
■ PIN_FLD_BILL_OBJ.
■ PIN_FLD_ROUNDING_MODE.
■ PIN_FLD_ROUNDING.

Changed input fields
■ PIN_FLD_ORDER_ACCEPT in the PIN_FLD_TAXES array is now mandatory.
■ PIN_FLD_ORDER_ORIGIN in the PIN_FLD_TAXES array is now mandatory.
■ PIN_FLD_SHIP_TO in the PIN_FLD_TAXES array is now mandatory.
■ PIN_FLD_SHIP_FROM in the PIN_FLD_TAXES array is now mandatory.

New output fields
■ PIN_FLD_STATUS_FLAGS.
■ PIN_FLD_FIELD_NAMES array.
■ PIN_FLD_EVENT_OBJ.
■ PIN_FLD_ACCOUNT_NO.
■ PIN_FLD_START_T.
■ PIN_FLD_END_T.
■ PIN_FLD_CURRENCY.
■ PIN_FLD_CURRENCY_NAME.
■ PIN_FLD_EXEMPTIONS array.
■ PIN_FLD_TAXES array:
  - PIN_FLD_TAX_CODE.
  - PIN_FLD_GL_ID.
  - PIN_FLD_AMOUNT_TAXED.
  - PIN_FLD_COMMAND.
  - PIN_FLD_INTERNATIONAL_IND.
  - PIN_FLD_SERVICE_TYPE.
  - PIN_FLD_TAXCODE_MAP.
- PIN_FLD_COUNT.
- PIN_FLD_ELAPSED_TIME.
- PIN_FLD_TAX_SUPPLIER.
- PIN_FLD_NAME.
- PIN_FLD_LOCATION.
- PIN_FLD_VAT_CERT.
- PIN_FLD_VATINFO array.
- PIN_FLD_RESULTS array.
- PIN_FLD_RESIDENCE_FLAG.
- PIN_FLD_INCORPORATED_FLAG.
- PIN_FLD_REGULATED_FLAG.
- PIN_FLD_BILL_OBJ.
- PIN_FLD_ROUNDING_MODE.
- PIN_FLD_ROUNDING.

**Changed output fields**
- PIN_FLD_ORDER_ACCEPT in the PIN_FLD_TAXES array is now mandatory.
- PIN_FLD_ORDER_ORIGIN in the PIN_FLD_TAXES array is now mandatory.
- PIN_FLD_SHIP_TO in the PIN_FLD_TAXES array is now mandatory.
- PIN_FLD_SHIP_FROM in the PIN_FLD_TAXES array is now mandatory.

**Radius Manager FM Policy Opcodes**

The following are the changes made to Radius Manager FM policy opcodes in BRM 7.4.

**PCM_OP_TERM_POL_ACCOUNTING**

Changed to pass the custom attributes in response to an accounting request.

**New input fields**
- PIN_FLD_INHERITED_INFO substruct.
  - PIN_FLD_PROGRAM_NAME.

**New output fields**
- PIN_FLD_INHERITED_INFO substruct.
  - PIN_FLD_PROGRAM_NAME.
- PIN_FLD_ARGS array.

**Resource Reservation FM Policy Opcodes**

The following are the changes made to Resource Reservation FM policy opcodes in BRM 7.4.

**PCM_OP_RESERVE_POL_POST_DISPUTE**

**New input fields**
■ PIN_FLD_POID.
■ PIN_FLD_ITEM_OBJ.

New output fields
■ PIN_FLD_RESERVATION_LIST array.

**PCM_OP_RESERVE_POL_POST_SETTLEMENT**
New input fields
■ PIN_FLD_ACCOUNT_OBJ.
■ PIN_FLD_DESCR.
■ PIN_FLD_ITEM_OBJ.

New output fields
■ PIN_FLD_ACCOUNT_OBJ.

**Services Framework Manager FM Policy Opcodes**
The following are the changes made to Services Framework Manager FM policy opcodes in BRM 7.4.

**PCM_OP_TCF_POL_APPLY_PARAMETER**
Removed input fields
PIN_FLD_PRODUCTS array:
■ PIN_FLD_PROD_PROVISIONING_TAGS array:
  – PIN_FLD_DATE_CHANGE_IMPACT.

Removed output fields
PIN_FLD_PRODUCTS array:
■ PIN_FLD_PROD_PROVISIONING_TAGS array:
  – PIN_FLD_DATE_CHANGE_IMPACT.

**Subscription Management FM Policy Opcodes**
The following are the changes made to Subscription Management FM policy opcodes in BRM 7.4.

**PCM_OP_SUBSCRIPTION_POL_PRE_TRANSITION_PLAN**
Changed to support the following feature:
■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

New input fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.

New output fields
■ PIN_FLD_LIMIT array.
  – PIN_FLD_THRESHOLDS array.
Voucher Management FM Policy Opcodes

The following are the changes made to Voucher Management FM policy opcodes in BRM 7.4.

PCM_OP_VOUCHER_POL_DEVICE_ASSOCIATE
Changed to record tax information for voucher top-ups with tax.

New output fields
- PIN_FLD_EXTENDED_INFO substruct:
  - PIN_FLD_SUB_BAL_IMPACTS array.
  - PIN_FLD_TAX_JURISDICTIONS array.

PCM_OP_VOUCHER_POL_ORDER_SET_ATTR
New output fields
- PIN_FLD_VOUCHER_ORDERS array:
  - PIN_FLD_CARD_EXPIRATION.

Changed Standard Opcodes

The following standard opcodes were changed between BRM 7.3.1 and BRM 7.4.

- Accounts Receivable FM Standard Opcodes
- Active Session Manager FM Standard Opcodes
- Activity FM Standard Opcodes
- Balance FM Standard Opcodes
- Billing FM Standard Opcodes
- Collections FM Opcodes
- Context Management Opcodes
- Customer FM Standard Opcodes
- GPRS Manager 3.0 FM Standard Opcodes
- GSM AAA Manager FM Standard Opcodes
- GSM Manager FM Standard Opcodes
- Invoicing FM Standard Opcodes
- Payment FM Standard Opcodes
- Pricing FM Standard Opcodes
- Process Audit FM Standard Opcodes
- Provisioning FM Standard Opcodes
- RADIUS Manager FM Standard Opcodes
- Rating FM Standard Opcodes
- Resource Reservation FM Standard Opcodes
- Services Framework AAA Manager FM Standard Opcodes
- Services Framework Manager FM Provisioning Opcodes
Accounts Receivable FM Standard Opcodes

The following are the changes made to Accounts Receivable FM standard opcodes in BRM 7.4.

**PCM_OP_AR_ACCOUNT_WRITEOFF**

Changed to perform validations to prevent second account write-off without reversing the previous write-off. See “About Account Write-Offs” in *BRM Managing Accounts Receivable*.

**Removed input fields**

- PIN_FLD_STR_VERSION.
- PIN_FLD_STRING_ID.

**New output fields**

PIN_FLD_RESULTS array.

- PIN_FLD_ACCOUNT_OBJ.
- PIN_FLD_POID.

- PIN_FLD_RESULTS array.
  - PIN_FLD_BAL_IMPACTS array.
  - PIN_FLD_SUB_BAL_IMPACTS array.
  - PIN_FLD_ACCOUNT_OBJ.

**Changed output fields**

- PIN_FLD_BILLINFO_OBJ in the PIN_FLD_RESULTS array is now optional.
- PIN_FLD_RESULT in the PIN_FLD_RESULTS array is now optional.

**PCM_OP_AR_BILL_SETTLEMENT**

Changed to support the settlement of the full bill-dispute amount.”Settling disputed bills” in *BRM Managing Accounts Receivable*.

**Changed input fields**

- PIN_FLD_AMOUNT is now optional.

**PCM_OP_AR_BILL_WRITEOFF**

**Removed input fields**

- PIN_FLD_START_T.
- PIN_FLD_STR_VERSION.
- PIN_FLD_STRING_ID.

**New output fields**

- PIN_FLD_RESULTS array.
  - PIN_FLD_BAL_IMPACTS array.
  - PIN_FLD_SUB_BAL_IMPACTS array.
- PIN_FLD_ACCOUNT_OBJ.

**PCM_OP_AR_BILLINFO_WRITEOFF**

Removed input fields
- PIN_FLD_STRING_ID.
- PIN_FLD_STR_VERSION.

New output fields
- PIN_FLD_RESULTS array:
  - PIN_FLD_BAL_IMPACTS array.
  - PIN_FLD_SUB_BAL_IMPACTS array.
  - PIN_FLD_ACCOUNT_OBJ.

**PCM_OP_AR_GET_BILL_ITEMS**

Changed to support the display of top-ups under correct bill. See "Retrieving a list of bill items for a bill unit" in *BRM Managing Accounts Receivable*.

New output fields
- PIN_FLD_RESULTS array:
  - PIN_FLD_BILL_OBJ.
  - PIN_FLD_AR_BILL_OBJ.

**PCM_OP_AR_EVENT_ADJUSTMENT**

Removed input fields
- PIN_FLD_STRING_ID.
- PIN_FLD_STR_VERSION.

**PCM_OP_AR_GET_DISPUTEDETAILS**

New output fields
- PIN_FLD_AGGREGATE_AMOUNTS array:
  - PIN_FLD_DISCOUNT.
  - PIN_FLD_DISPUTED.
  - PIN_FLD_ALLOCATED.

**PCM_OP_AR_ITEM_DISPUTE**

Changed to perform validation when the specified dispute amount is more than the net item due. See "Disputing items" in *BRM Managing Accounts Receivable*.

New output fields
- PIN_FLD_AMOUNT.

**PCM_OP_AR_ITEM_SETTLEMENT**

Changed to perform validation when the specified settlement amount is more than the net disputed amount of the item. See "Settling disputed items" in *BRM Managing Accounts Receivable*.

New output fields
- PIN_FLD_AMOUNT.

**PCM_OP_AR_ITEM_WRITEOFF**

Changed to prevent account write-off when the account due is zero. See "How BRM performs write-offs" in *BRM Managing Accounts Receivable*.

**New input fields**

- PIN_FLD_AR_BILLINFO_OBJ.
- PIN_FLD_BILLINFO_OBJ.
- PIN_FLD_ACCOUNT_OBJ.
- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_ITEMS array.
  - PIN_FLD_BILL_OBJ.
  - PIN_FLD_AR_BILL_OBJ.
  - PIN_FLD_ACCOUNT_OBJ.
  - PIN_FLD_DISPUTED.
  - PIN_FLD_STATUS.
  - PIN_FLD_EFFECTIVE_T.
  - PIN_FLD_ITEM_TOTAL.
  - PIN_FLD_RECVD.
  - PIN_FLD_ADJUSTED.
  - PIN_FLD_TRANSFERED.
  - PIN_FLD_CURRENCY.

**Removed input fields**

- PIN_FLD_START_T.
- PIN_FLD_STRING_ID.
- PIN_FLD_STR_VERSION.

**New output fields**

- PIN_FLD_RESULTS array.
  - PIN_FLD_BAL_IMPACTS.
  - PIN_FLD_SUB_BAL_IMPACTS array.
  - PIN_FLD_ACCOUNT_OBJ.

**Active Session Manager FM Standard Opcodes**

The following are the changes made to Active Session Manager FM standard opcodes in BRM 7.4.

**PCM_OP_ASM_UPDATE_ACTIVE_SESSION**

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions,
such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields
- PIN_FLD_SESSION_ID.

Activity FM Standard Opcodes

The following are the changes made to Activity FM standard opcodes in BRM 7.4.

**PCM_OP_ACT_ACTIVITY**
Changed to support the direct debit mode feature.

New input fields
- PIN_FLD_FLAGS.
- PIN_FLD_ACTIVE_SESSION_ID.

Changed input fields
- PIN_FLD_RATE_PLAN_NAME is now optional.

**PCM_OP_ACT_AUTHORIZE**
Changed to support the following feature:
- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields
- PIN_FLD_SESSION_ID.

Removed input fields
- PIN_FLD_USAGE_TYPE.
- PIN_FLD_SCALED_DELAY_TIME.

New output fields
- PIN_FLD_RESERVATION_LIST array:
  - PIN_FLD_ACCOUNT_OBJ.

Removed output fields
- PIN_FLD_RUM_NAME from the PIN_FLD_BALANCES array.

**PCM_OP_ACT_CHECK_RESOURCE_THRESHOLD**
Changed to call the PCM_OP_ACT_POL_SET_RESOURCE_STATUS policy opcode after the resource availability status is computed. See "How BRM reduces authorization latencies" and How BRM uses a scaled delay time to reduce network spikes during a tariff change in BRM Telco Integration.

New input fields
- PIN_FLD_EXTENDED_INFO substruct.

**PCM_OP_ACT_END_SESSION**
Changed to support the direct debit mode feature.
New input fields
- PIN_FLD_FLAGS.

**PCM_OP_ACT_LOGIN**
Changed to support logging of CSR activities. See "Logging customer service representative activities" in *BRM System Administrator’s Guide*.

New input fields
- PIN_FLD_NAP_IP_ADDRESS.

**PCM_OP_ACT_MULTI_AUTHORIZE**
Changed input fields
- PIN_FLD_SERVICE_OBJ in the PIN_FLD_EVENT substruct is now optional.
- PIN_FLD_ACCOUNT_OBJ in the PIN_FLD_EVENT substruct is now optional.

New output fields
- PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_OBJ.
- PIN_FLD_RESULTS array:
  - PIN_FLD_SERVICE_OBJ.
- PIN_FLD_VALID_TO.
- PIN_FLD_BALANCES array:
  - PIN_FLD_RESERVED_AMOUNT.
  - PIN_FLD_NEXT_BAL.
  - PIN_FLD_CURRENTBAL.
  - PIN_FLD_CREDIT_FLOOR.
  - PIN_FLD_CREDIT_LIMIT.
  - PIN_FLD_CREDIT_THRESHOLDS.
  - PIN_FLD_CREDIT_THRESHOLDS_FIXED.

Changed output fields
- PIN_FLD_AMOUNT in the PIN_FLD_BALANCES array is now optional.

**PCM_OP_ACT_REAUTHORIZE**
Changed to support the following feature:
- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in *BRM Telco Integration*.

New input fields
- PIN_FLD_SESSION_ID.
- PIN_FLD_FLAGS (optional) has been added to the PIN_FLD_RATING_INFO substruct.
**PCM_OP_ACT_USAGE**

**New input fields**
- **PIN_FLD_EVENT array:**
  - **PIN_FLD_EFFECTIVE_T.**
  - **PIN_FLD_CYCLE_INFO** substruct.
- **PIN_FLD_PRODUCTS array.**
  - **PIN_FLD_TYPE.**
  - **PIN_FLD_EVENT_TYPE.**
- **PIN_FLD_CYCLE_DISCOUNTS array.**
- **PIN_FLD_DISCOUNT_LIST array.**
  - **PIN_FLD_EFFECTIVE_T.**
  - **PIN_FLD_INSTANTIATED_T.**
  - **PIN_FLD_PLAN_OBJ.**
  - **PIN_FLD_SERVICE_OBJ.**
  - **PIN_FLD_CYCLE_FEE_FLAGS.**
- **PIN_FLD_QUANTITY.**
- **PIN_FLD_ORIGINAL_SCALE.**
- **PIN_FLD_NAME.**
- **PIN_FLD_BALANCES array:**
  - **PIN_FLD_RESERVED_AMOUNT.**
  - **PIN_FLD_NEXT_BAL.**
  - **PIN_FLD_CURRENT_BAL.**
  - **PIN_FLD_CREDIT_FLOOR.**
  - **PIN_FLD_CREDIT_LIMIT.**
  - **PIN_FLD_CREDIT_THRESHOLDS.**
  - **PIN_FLD_CREDIT_THRESHOLDS_FIXED.**

**Changed input fields**
- **PIN_FLD_LAST_MODIFIED_T** in the **PIN_FLD_PRODUCTS array** is now **PIN_FLD_EFFECTIVE_T.**

**New output fields**
- **PIN_FLD_RESULTS array.**
- **PIN_FLD_NET_QUANTITY.**
- **PIN_FLD_RUM_NAME.**
- **PIN_FLD_BALANCE_IMPACTS array.**
  - **PIN_FLD_BILLINFO_OBJ.**
  - **PIN_FLD_OFFERING_OBJ.**
  - **PIN_FLD_IMPACT_CATEGORY.**
  - **PIN_FLD_LINEAGE.**
Balance FM Standard Opcodes

The following are the changes made to Balance FM standard opcodes in BRM 7.4.

**PCM_OP_BAL_GET_BALANCES**

Changed to support the following feature:

- Moving balance groups to a different bill unit. See "About transferring services between balance groups" in *BRM Managing Accounts Receivable.*
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating.*

This opcode now determines which `/balance_group` object to retrieve by using the event end time and the `/service` object's PIN_FLD_TRANSFER_LIST array. If a balance group is not specified in the array, the opcode retrieves the service-level balance group. See "Finding a balance group and its balances" in *BRM Managing Accounts Receivable.*

**New input fields**

- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**New output fields**

- PIN_FLD_EFFECTIVE_T.
- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_BAL_GET_BAL_GRP_AND_SVC**

Changed to support the following feature:

- Moving balance groups to a different bill unit. See "About transferring services between balance groups" in *BRM Managing Accounts Receivable.*

This opcode now determines which `/balance_group` object to retrieve by using the event end time and the `/service` object's PIN_FLD_TRANSFER_LIST array. If a balance group is not specified in the array, the opcode retrieves the service-level balance group. See "Finding a balance group and its balances" in *BRM Managing Accounts Receivable.*

There are no changes to this opcode's input and output fields.

**PCM_OP_BAL_GET_MONITOR_BAL**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating.*

**New output fields**

- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_BAL_GET_PREPAID_BALANCES**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating.*

**New input fields**
- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**New output fields**

- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**Billing FM Standard Opcodes**

The following are the changes made to Billing FM standard opcodes in BRM 7.4.

**PCM_OP_BILL_SET_LIMIT_AND_CR**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**

- PIN_FLD_RULES array is now optional.
- PIN_FLD_CONSUMPTION_RULE in the PIN_FLD_RULES array is now mandatory.

**New output fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed output fields**

- PIN_FLD_CONSUMPTION_RULE in the PIN_FLD_RULES array is now mandatory.

**PCM_OP_BILL_TRANSFER_BALANCE**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New output fields**

- PIN_FLD_BALANCES array.
  - PIN_FLD_THRESHOLDS array.

**Collections FM Opcodes**

The following are the changes made to Collections FM standard opcodes in BRM 7.4.

**PCM_OP_COLLECTIONS_PROCESS_BILLINFO**

Changed to support the following feature:
Changed Standard Opcodes

Opcode Changes from BRM 7.3.1 to BRM 7.4

■ Enabling external client applications to track and manage collections activities. See "About integrating Collections Manager with custom client applications" in BRM Collections Manager.

This opcode now generates the /event/audit/collections/action event when an account enters or exits collections. See Executing automatic collections actions under "Managing overdue balance collection" in BRM Collections Manager.

There are no changes to this opcode's input and output flists.

**PCM_OP_COLLECTIONS_TAKE_ACTION**

Changed to support the following feature:

■ Enabling external client applications to track and manage collections activities. See "About integrating Collections Manager with custom client applications" in BRM Collections Manager.

This opcode now generates the /event/audit/collections/action event after the opcode performs a custom or system action. See Executing pending actions for a bill unit under "Performing system collections actions" in BRM Collections Manager.

There are no changes to this opcode's input and output flists.

**Context Management Opcodes**

The following are the changes made to Context Management FM standard opcodes in BRM 7.4.

**PCM_CONTEXT_OPEN**

Changed to support the following feature:


**New input fields**

■ PIN_FLD_AUTO_RECONNECT.

**Customer FM Standard Opcodes**

The following are the changes made to Customer FM standard opcodes in BRM 7.4.

**PCM_OP_CUST_CHANGE_BUSINESS_PROFILE**

Changed to support the following feature:

■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

■ PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_COMMIT_CUSTOMER**

Changed to support the following feature:

■ Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in **BRM Setting Up Pricing and Rating**.

**New input fields**
- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
- PIN_FLD_BILLINFO array.
  - PIN_FLD_ACCTG_TYPE.
- PIN_FLD_PAYINFO array.
  - PIN_FLD_FLAGS.

**Changed input fields**
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**New output fields**
- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
- PIN_FLD_BILLINFO array.
  - PIN_FLD_ACCTG_TYPE.

**Changed output fields**
- PIN_FLD_ACCTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**PCM_OP_CUST_CREATE_ACCT**

Changed to support the following feature:
- Supporting the accounting type at the bill unit level. See "About accounting types" in **BRM Configuring and Running Billing**.
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in **BRM Setting Up Pricing and Rating**.

**New input fields**
- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**
- PIN_FLD_ACCTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**New output fields**
- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
Changed Standard Opcodes

Opcode Changes from BRM 7.3.1 to BRM 7.4

- PIN_FLD_BILLINFO array.
  - PIN_FLD_ACTG_TYPE.

**Changed output fields**

- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**PCM_OP_CUST_CREATE_BAL_GRP**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_CREATE_BILLINFO**

Changed to support the following feature:

- Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.

**New input fields**

- PIN_FLD_BILLINFO array.
  - PIN_FLD_ACTG_TYPE.

**PCM_OP_CUST_CREATE_CUSTOMER**

Changed to support the following feature:

- Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.
  - Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**

- PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**New output fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed output fields**

- PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**PCM_OP_CUST_CREATE_PAYINFO**

New input fields

- PIN_FLD_FLAGS.

**PCM_OP_CUST_CREATE_PROFILE**

Changed to support the following feature:

- Creating *profile* objects through the BRM JCA Resource Adapter. See "Connecting J2EE-compliant applications to BRM" in *BRM Web Services Manager*.

New input fields

- PIN_FLD_NAME.
- PIN_FLD_PROFILES array.

---

**Note:** The PIN_FLD_PROFILES array can have only one element. If more than one element is passed, the opcode ignores the array.

---

Changed input fields

- The PIN_FLD_INHERITED_INFO substruct was moved to the PIN_FLD_PROFILES array.

---

**Note:** For backwards compatibility, the opcode still accepts input files sent in the old format.

---

**PCM_OP_CUST_CREATE_TOPUP**

New input fields

- PIN_FLD_TOPUP_INFO array.
  - PIN_FLD_ACCOUNT_OBJ.
- PIN_FLD_GROUP_TOPUP_INFO array:
  - PIN_FLD_PARENT.

Changed input fields

- PIN_FLD_TOPUP_AMT in the PIN_FLD_TOPUP_INFO array is now optional.
- PIN_FLD_PARENT was moved from the PIN_FLD_GROUP_TOPUP_INFO array into the PIN_FLD_TOPUP_INFO array.

**PCM_OP_CUST_MODIFY_CUSTOMER**

Changed to support the following feature:

- Supporting the accounting type at the bill unit level. See "About accounting types" in *BRM Configuring and Running Billing*.
- Moving balance groups to a different bill unit. See "About transferring services between balance groups" in *BRM Managing Accounts Receivable*.
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.
New input fields

- PIN_FLD_LIMIT array:
  - PIN_FLD_THRESHOLDS array.
- PIN_FLD_BILLINFO array:
  - PIN_FLD_ACTG_TYPE.
- PIN_FLD_PAYINFO array:
  - PIN_FLD_FLAGS.

Changed input fields

- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

New output fields

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
- PIN_FLD_BILLINFO array.
  - PIN_FLD_ACTG_TYPE.

Changed output fields

- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**PCM_OP_CUST_MODIFY_PROFILE**

Changed to support the following feature:

- Modifying /profile objects through the BRM JCA Resource Adapter. See "Connecting J2EE-compliant applications to BRM" in BRM Web Services Manager.

New input fields

- PIN_FLD_PROFILES array.

**Note:** The PIN_FLD_PROFILES array can have only one element. If more than one element is passed, the opcode ignores the array.

Changed input fields

- The PIN_FLD_INHERITED_INFO substruct was moved to the PIN_FLD_PROFILES array.

**Note:** For backwards compatibility, the opcode still accepts input flists sent in the old format.

**PCM_OP_CUST_MODIFY_TOPUP**

New input fields

- PIN_FLD_TOPUP_INFO array:
  - PIN_FLD_ACCOUNT_OBJ.
  - PIN_FLD_GROUP_TOPUP_INFO
Changed Standard Opcodes

- PIN_FLD_PARENT.

**Changed input fields**

- PIN_FLD_PARENT was moved from the PIN_FLD_GROUP_TOPUP_INFO array into the PIN_FLD_TOPUP_INFO array.

**PCM_OP_CUST_PREP_CUSTOMER**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**

- PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSESET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**New output fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**

- PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSESET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**PCM_OP_CUST_SET_ACCTINFO**

Changed to support the following feature:

- Supporting the accounting type at the bill unit level. See "About accounting types" in BRM Configuring and Running Billing.

**Removed input fields**

- PIN_FLD_ACTG_TYPE.

**PCM_OP_CUST_SET_BAL_GRP**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**PCM_OP_CUST_SET_BILLINFO**

Changed to support the following feature:
■ Supporting the accounting type at the bill unit level. See "About accounting types" in *BRM Configuring and Running Billing*.

**New input fields**

■ PIN_FLD_BILLINFO array.
  - PIN_FLD_ACTG_TYPE.

**PCM_OP_CUST_SET_TOPUP**

**New input fields**

■ PIN_FLD_TOPUP_INFO array.
  - PIN_FLD_ACCOUNT_OBJ.
■ PIN_FLD_GROUP_TOPUP_INFO array:
  - PIN_FLD_PARENT.

**Changed input fields**

■ PIN_FLD_PARENT was moved from the PIN_FLD_GROUP_TOPUP_INFO array into the PIN_FLD_TOPUP_INFO array.
■ PIN_FLD_TOPUP_AMT in the PIN_FLD_TOPUP_INFO array is now optional.

**PCM_OP_CUST_UPDATE_CUSTOMER**

Changed to support the following feature:

■ Supporting the accounting type at the bill unit level. See "About accounting types" in *BRM Configuring and Running Billing*.
■ Moving balance groups to a different bill unit. See "About transferring services between balance groups" in *BRM Managing Accounts Receivable*.
■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

**New input fields**

■ PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
■ PIN_FLD_BILLINFO array:
  - PIN_FLD_ACTG_TYPE.
■ PIN_FLD_TOPUP_INFO array:
  - PIN_FLD_PARENT.
■ PIN_FLD_PAYINFO array:
  - PIN_FLD_FLAGS.

**Changed input fields**

■ PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

**New output fields**

■ PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed output fields**
PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array is now PIN_FLD_PAYMENT_OFFSET.

PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.

**PCM_OP_CUST_UPDATE_SERVICES**

New input fields

- PIN_FLD_FLAGS.

**PCM_OP_CUST_VALIDATE_CUSTOMER**

Changed to support the following feature:

- Supporting the accounting type at the bill unit level. See "About accounting types" in *BRM Configuring and Running Billing*.

Changed input fields

- PIN_FLD_ACTG_TYPE was moved from the PIN_FLD_ACCTINFO array into the PIN_FLD_BILLINFO array.

**GPRS Manager 3.0 FM Standard Opcodes**

The following are the changes made to GPRS Manager 3.0 FM standard opcodes in BRM 7.4.

**PCM_OP_GPRS_APPLY_PARAMETER**

Removed input fields

PIN_FLD_PRODUCTS array:

- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

Removed output fields

PIN_FLD_PRODUCTS array:

- PIN_FLD_PROD_PROVISIONING_TAGS array:
  - PIN_FLD_DATE_CHANGE_IMPACT.

**GSM AAA Manager FM Standard Opcodes**

The following are the changes made to GSM AAA Manager FM standard opcodes in BRM 7.4.

**PCM_OP_GSM_AAA_AUTHORIZE**

New output fields

- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.

Removed output fields

- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.
**PCM_OP_GSM_AAA_CANCEL_AUTHORIZATION**

New input fields
- PIN_FLD_OBJ_TYPE.
- PIN_FLD_NETWORK_SESSION_CORRELATION.
- PIN_FLD_SESSION_TYPE.
- PIN_FLD_SESSION_ID.
- PIN_FLD_ORIGIN_NETWORK.
- PIN_FLD_DESTINATION_NETWORK.
- PIN_FLD_CALLING_NUMBER.
- PIN_FLD_CALLED_NUMBER.
- PIN_FLD_SVC_TYPE.
- PIN_FLD_SVC_CODE.
- PIN_FLD_USAGE_CLASS.
- PIN_FLD_PRIMARY_MSID.
- PIN_FLD_SECONDARY_MSID.
- PIN_FLD_SERVICE_CODES array.
- PIN_FLD_EXTENDED_INFO substruct.

**PCM_OP_GSM_AAA_REAUTHORIZE**

New input fields
- PIN_FLD_UNIT_MEASURE.

New output fields
- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVED_LIST array.

Removed output fields
- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.

**PCM_OP_GSM_AAA_STOP_ACCOUNTING**

Changed to support the direct debit mode feature.

New input fields
- PIN_FLD_MODE.

New output fields
- PIN_FLD_QUANTITY.
- PIN_FLD_RUM_NAME.
- PIN_FLD_RUM_MAP array.
- PIN_FLD_RESULT.
- PIN_FLD_REASON.
**PCM_OP_GSM_AAA_UPDATE_AND_REAUTHORIZE**

- **New output fields**
  - PIN_FLD_BAL_GRP_OBJ.
  - PIN_FLD RESERVATION_LIST array.

- **Removed output fields**
  - PIN_FLD_BALANCES array:
    - PIN_FLD_RUM_NAME.

**GSM Manager FM Standard Opcodes**

The following are the changes made to GSM Manager FM standard opcodes in BRM 7.4.

**PCM_OP_GSM_APPLY_PARAMETER**

- **Removed input fields**
  - PIN_FLD_PRODUCTS array:
    - PIN_FLD_PROD_PROVISIONING_TAGS array:
      - PIN_FLD_DATE_CHANGE_IMPACT.

- **Removed output fields**
  - PIN_FLD_PRODUCTS array:
    - PIN_FLD_PROD_PROVISIONING_TAGS array:
      - PIN_FLD_DATE_CHANGE_IMPACT.

**Invoicing FM Standard Opcodes**

The following are the changes made to Invoicing FM standard opcodes in BRM 7.4.

**PCM_OP_INV_MAKE_INVOICE**

Changed to support the following feature:

- Adding Siebel CRM promotion names to BRM invoices. See "Adding Siebel CRM promotion names to invoices" in *BRM Release Notes*.

There are no changes to this opcode's input and output flists.

**Payment FM Standard Opcodes**

The following are the changes made to Payment FM standard opcodes in BRM 7.4.

**PCM_OP_PYMT_COLLECT**

Changed to support the following feature:

- Allocating account-level payments to multiple bill units. See "Allocating account-level payments to multiple bill units" in *BRM Configuring and Collecting Payments*.

- **New output fields**
  - PIN_FLD_RESULTS array.
    - PIN_FLD_RESULTS array.
**PCM_OP_PYMT_ITEM_SEARCH**

Changed to support the following feature:

- Allocating payment to multiple bill units in Payment Tool. See "Allocating an account-level payment to multiple bill units" in *BRM Configuring and Collecting Payments*.

New output fields

- PIN_FLD_RESULTS array.
  - PIN_FLD_AR_BILLINFO_OBJ.

**PCM_OP_PYMT_MBI_DISTRIBUTE**

New input fields

- PIN_FLD_END_T.

**PCM_OP_PYMT_RECYCLE_PAYMENT**

Changed to support the following feature:

- Allocating account-level payments to multiple bill units. See "Allocating account-level payments to multiple bill units" in *BRM Configuring and Collecting Payments*.

Changed input fields

- The PIN_FLD_CHARGES array is now mandatory.

New output fields

- PIN_FLD_RESULTS array.
  - PIN_FLD_RESULTS array.

**PCM_OP_PYMT_SELECT_ITEMS**

Changed to support the following feature:

- Allocating account-level payments to multiple bill units. See "Allocating account-level payments to multiple bill units" in *BRM Configuring and Collecting Payments*.

New input fields

- PIN_FLD_END_T.
- PIN_FLD_BILLINFO array.
  - PIN_FLD_CURRENCY.
- PIN_FLD_PAYMENT_REASONS array.

New output fields

- PIN_FLD_CHARGES array.
  - PIN_FLD_PAYMENT_REASONS array.
  - PIN_FLD_BILLINFO array.

**PCM_OP_PYMT_TOPUP**

New input fields

- PIN_FLD_TOPUP_INFO array:
- PIN_FLD_NEXT_TOPUP_T.
- PIN_FLD_TOPUP_INTERVAL.

New output fields
- PIN_FLD_BAL_IMPACTS array:
  - PIN_FLD_IMPACT_TYPE.

**PCM_OP_PYMT_VALIDATE**
Changed to support the following feature:
- Allocating account-level payments to multiple bill units. See "Allocating account-level payments to multiple bill units" in *BRM Configuring and Collecting Payments*.

New input fields
- PIN_FLD_CHARGES array.
  - PIN_FLD_ACH.
- PIN_FLD_BATCH_INFO array.

**Pricing FM Standard Opcodes**
The following are the changes made to Pricing FM standard opcodes in BRM 7.4.

**PCM_OP_PRICE_COMMIT_DEAL**
New input fields
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_CODE.
- PIN_FLD_DISCOUNTS array:
  - PIN_FLD_CODE.

**PCM_OP_PRICE_COMMIT_DISCOUNT**
Changed to support the following feature:
- Exporting discount data to external CRM applications. See "Understanding the Synchronization Queue Data Manager" in *BRM Synchronization Queue Manager*.

New input fields
- PIN_FLD_PIPELINE_DISC_MODELS array.
- PIN_FLD_DISCOUNTS array:
  - PIN_FLD_CODE.

New output fields
- PIN_FLD_DISCOUNTS array.

**PCM_OP_PRICE_COMMIT_PLAN**
Changed to support the following feature:
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

New input fields
■ PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_PLAN array.

■ PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_BAL_INFO array.

**PCM_OP_PRICE_COMMIT_PRODUCT**

New input fields

■ PIN_FLD_PRODUCTS array:
  – PIN_FLD_CODE.

■ PIN_FLD_RATE_PLAN_SELECTOR substruct:
  – PIN_FLD_SELECTOR.

Changed input fields

■ PIN_FLD_PIPELINE_RATEPLANS array was moved from the PIN_FLD_RATEPLANS array into the PIN_FLD_PRODUCTS array.

Removed input fields

■ PIN_FLD_RATE_PLAN_SELECTOR.
  – PIN_FLD_SELCTOR_TREE substruct.

**PCM_OP_PRICE_GET_PRICE_LIST**

Changed to support the following feature:

■ Enabling the `loadpricelist` utility to import and export pricing data based on the service type and object modification time. See "Using the XML pricing interface to create a price list" in *BRM Setting Up Pricing and Rating*.

■ Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

New input fields

■ PIN_FLD_PERMITTED.

■ PIN_FLD_MOD_T.

■ PIN_FLD_NAME.

New output fields

■ PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_BAL_INFO array.

■ PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_PLAN array.

■ PIN_FLD_PRODUCTS array:
  – PIN_FLD_CODE.

■ PIN_FLD_DISCOUNTS array:
  – PIN_FLD_CODE.

■ PIN_FLD_RATE_PLAN_SELECTOR substruct:
  – PIN_FLD_SELECTOR.

Removed output fields
- PIN_FLD_RATE_PLAN_SELECTOR.
  - PIN_FLD_SELECTOR_TREE substruct.

**PCM_OP_PRICE_GET_PRODUCT_INFO**

Changed to support the following feature:

- Exporting product provisioning tags to external CRM applications. See "Understanding the Synchronization Queue Data Manager" in *BRM Synchronization Queue Manager*.

**New output fields**

- PIN_FLD_PROVISIONING_TAG_INFO array.
- PIN_FLD_POID.
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_CODE.

**Changed output fields**

- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR substruct was changed to PIN_FLD_SELECTOR buffer.

**PCM_OPPRICE_PREP_TAILORMADE_PRODUCT**

**New input fields**

- PIN_FLD_PRODUCTS array:
  - PIN_FLD_CODE

**Changed input fields**

- PIN_FLD_PIPELINE_RATEPLANS array was moved from the PIN_FLD_RATE_PLANS array into the PIN_FLD_PRODUCTS array.

**New output fields**

- PIN_FLD_POID.
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_CODE.
- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR.

**Removed output fields**

- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR_TREE substruct.

**PCM_OP_PRICE_SET_PRICE_LIST**

Changed to support the following feature:

- Exporting /sponsorship objects to external CRM applications. See "Understanding the Synchronization Queue Data Manager" in *BRM Synchronization Queue Manager*.
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

**New input fields**
Changed Standard Opcodes

- PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_PLAN array.
- PIN_FLD_THRESHOLDS array in the PIN_FLD_LIMIT array of the PIN_FLD_BAL_INFO array.
- PIN_FLD_CODE in the PIN_FLD_DISCOUNTS array and the PIN_FLD_PRODUCTS array of the PIN_FLD_DEALS array.
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_CODE.
- PIN_FLD_DISCOUNTS array:
  - PIN_FLD_CODE.
  - PIN_FLD_PIPELINE_DISC_MODELS array.
- PIN_FLD_RATE_PLANS array:
  - PIN_FLD_CYCLE_FEE_FLAGS.
- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR.

Changed input fields

- PIN_FLD_PIPELINE_RATEPLANS array was moved from the PIN_FLD_RATE_PLANS array into the PIN_FLD_PRODUCTS array.

Removed input fields

- PIN_FLD_RATE_PLAN_SELECTOR substruct:
  - PIN_FLD_SELECTOR_TREE substruct.

New output fields

- PIN_FLD_DISCOUNTS array.

Process Audit FM Standard Opcodes

The following are the changes made to Process Audit FM standard opcodes in BRM 7.4.

PCM_OP_PROCESS_AUDIT_CREATE

Removed input fields

- PIN_FLD_FAILED_ACCOUNTS array:
  - PIN_FLD_FAILED_ACCOUNT_OBJ.
  - PIN_FLD_FAILED_BILL_OBJ.
  - PIN_FLD_FAILED_ERROR_CODE.

Provisioning FM Standard Opcodes

The following are the changes made to Provisioning FM standard opcodes in BRM 7.4.

PCM_OP_PROV_PUBLISH_SVC_ORDER

Removed output fields

- PIN_FLD_STATUS.
**Changed Standard Opcodes**

- PIN_FLD_STATUS_FLAGS.
- PIN_FLD_STATUS_MSG.
- PIN_FLD_EXTENDED_INFO.

**PCM_OP_PROV_UPDATE_SVC_ORDER**

**New input fields**
- PIN_FLD_PROGRAM_NAME.
- PIN_FLD_EXTENDED_INFO substruct:
  - PIN_FLD_PARAMS.

**New output fields**
- PIN_FLD_RESULTS array:
  - PIN_FLD_SERVICE_OBJ.
  - PIN_FLD_ACCOUNT_OBJ.
  - PIN_FLD_RATING_STATUS.

**RADIUS Manager FM Standard Opcodes**

The following are the changes made to RADIUS Manager FM standard opcodes in BRM 7.4.

**PCM_OP_TERM_IP_DIALUP_START_ACCOUNTING**

**New output fields**
- PIN_FLD_ARGS array.

**PCM_OP_TERM_IP_DIALUP_STOP_ACCOUNTING**

**New output fields**
- PIN_FLD_ARGS array.

**PCM_OP_TERM_IP_DIALUP_UPDATE_ACCOUNTING**

**New input fields**
- PIN_FLD_ELAPSED_TIME.
- PIN_FLD_BYTES_IN.
- PIN_FLD_BYTES_OUT.
- PIN_FLD_PACKETS_IN.
- PIN_FLD_PACKETS_OUT.
- PIN_FLD_DESCR.

**Changed input fields**
- PIN_FLD_STATUS mandatory is now PIN_FLD_UNITS optional.

**New output fields**
- PIN_FLD_ARGS array.
Rating FM Standard Opcodes

The following are the changes made to Rating FM standard opcodes in BRM 7.4.

**PCM_OP_RATE_TAX_CALC**
- **New input fields**
  - PIN_FLD_EVENT_OBJ.
- **New output fields**
  - PIN_FLD_EVENT_OBJ.

Resource Reservation FM Standard Opcodes

The following are the changes made to Resource Reservation FM standard opcodes in BRM 7.4.

**PCM_OP_RESERVE_CREATE**
- **New output fields**
  - PIN_FLD_BAL_GRP_OBJ.
- **Removed output fields**
  - PIN_FLD_BALANCE_GROUP from the PIN_FLD_RESERVATION_LIST array.

**PCM_OP_RESERVE_EXTEND**
- **New input fields**
  - PIN_FLD_FLAGS.

Services Framework AAA Manager FM Standard Opcodes

The following are the changes made to Services Framework AAA Manager FM standard opcodes in BRM 7.4.

**PCM_OP_TCF_AAA_ACCOUNTING**
- **Changed to support the direct debit mode feature.**
- **New input fields**
  - PIN_FLD_MODE.
- **New output fields**
  - PIN_FLD_QUANTITY.
  - PIN_FLD_RUM_NAME.
  - PIN_FLD_RUM_MAP array.
  - PIN_FLD_RESULT.
  - PIN_FLD_REASON.

**PCM_OP_TCF_AAA_ACCOUNTING_OFF**
- **New input fields**
  - PIN_FLD_OBJ_TYPE.
PCM_OP_TCF_AAA_ACCOUNTING_PREP_INPUT

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields

- PIN_FLD_SESSION_ID.
- PIN_FLD_MODE.

Changed input fields

- PIN_FLD_SESSION_ID in the PIN_FLD_SESSION_INFO array is now optional.

PCM_OP_TCF_AAA_AUTHORIZE

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields

- PIN_FLD_SESSION_ID.

New output fields

- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.

Removed output fields

- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.

PCM_OP_TCF_AAA_AUTHORIZE_PREP_INPUT

Removed input fields

- PIN_FLD_SESSION_INFO array.

PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION

New input fields

- PIN_FLD_OBJ_TYPE.
- PIN_FLD_SESSION_TYPE.
- PIN_FLD_EXTENDED_INFO substruct.
- PIN_FLD_SESSION_ID.
- PIN_FLD_ORIGIN_NETWORK.
- PIN_FLD_DESTINATION_NETWORK.
- PIN_FLD_CALLING_NUMBER.
- PIN_FLD_CALLED_NUMBER.
- PIN_FLD_SVC_TYPE.
- PIN_FLD_SVC_CODE.
- PIN_FLD_USAGE_CLASS.
- PIN_FLD_PRIMARY_MSID.
- PIN_FLD_SECONDARY_MSID.
- PIN_FLD_SERVICE_CODES array.

**PCM_OP_TCF_AAA_PREP_INPUT**

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in *BRM Telco Integration*.

**New input fields**

- PIN_FLD_SESSION_ID.

**Changed input fields**

- PIN_FLD_SESSION_ID in the PIN_FLD_SESSION_INFO array is now optional.

**PCM_OP_TCF_AAA_REAUTHORIZE**

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in *BRM Telco Integration*.

**New input fields**

- PIN_FLD_SESSION_ID.
- PIN_FLD_UNIT_MEASURE.

**New output fields**

- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.

**Removed output fields**

- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.

**PCM_OP_TCF_AAA_REAUTHORIZE_PREP_INPUT**

Changed to support the following feature:

- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in *BRM Telco Integration*.

**New input fields**

- PIN_FLD_UNIT_MEASURE.
- PIN_FLD_SESSION_ID.
Changed Standard Opcodes

Changed input fields
- PIN_FLD_SESSION_ID in the PIN_FLD_SESSION_INFO array is now optional.

**PCM_OP_TCF_AAA_STOP_ACCOUNTING**
Changed to support the following feature:
- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields
- PIN_FLD_MODE.

New output fields
- PIN_FLD_QUANTITY.
- PIN_FLD_RUM_NAME.
- PIN_FLD_RUM_MAP array.
- PIN_FLD_RESULT.
- PIN_FLD_REASON.
- PIN_FLD_SESSION_INFO array.
  - PIN_FLD_SESSION_ID.

**PCM_OP_TCF_AAA_STOP_ACCOUNTING_PREP_INPUT**
Changed to support the following feature:
- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

New input fields
- PIN_FLD_MODE.

Changed input fields
- PIN_FLD_SESSION_ID in the PIN_FLD_SESSION_INFO array is now optional.

**PCM_OP_TCF_AAA_UPDATE_ACCOUNTING_PREP_INPUT**
Changed to support the following feature:
- In addition to checking for duplicate authentication and authorization requests, Services Framework AAA Manager now checks for other duplicate AAA actions, such as reauthorization, update accounting, and stop accounting. See "About performing AAA for prepaid services" in BRM Telco Integration.

Changed input fields
- PIN_FLD_SESSION_ID in the PIN_FLD_SESSION_INFO array is now optional.

**PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE**
Changed to support aggregating the input volume upload or download with the already reserved quota.
New input fields
- PIN_FLD_UNIT_MEASURE.

New output fields
- PIN_FLD_BAL_GRP_OBJ.
- PIN_FLD_RESERVATION_LIST array.

Removed output fields
- PIN_FLD_BALANCES array:
  - PIN_FLD_RUM_NAME.

Services Framework Manager FM Provisioning Opcodes
The following are the changes made to Services Framework Manager FM standard opcodes in BRM 7.4.

PCM_OP_TCF_SVC_LISTENER
New input fields
- PIN_FLD_PRODUCTS array.

Subscription Management FM Standard Opcodes
The following are the changes made to Subscription Management FM standard opcodes in BRM 7.4.

PCM_OP_SUBSCRIPTION_CALC_BEST_PRICING
New output fields
- PIN_FLD_RESULTS array.
  - PIN_FLD_ACCOUNT_OBJ.

PCM_OP_SUBSCRIPTIONCancelar_DISCOUNT
Changed to perform additional validations when backdating a discount cancellation. See "How discounts are canceled" in BRM Managing Customers.
There are no changes to this opcode's input and output flists.

PCM_OP_SUBSCRIPTIONCancelar_PRODUCT
Changed to perform additional validations when backdating a product cancellation. See "How products are canceled" in BRM Managing Customers.
There are no changes to this opcode's input and output flists.

PCM_OP_SUBSCRIPTIONCHANGE_OPTIONS
Changed to support the following feature:
- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in BRM Setting Up Pricing and Rating.

New input fields
- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.
**PCM_OP_SUBSCRIPTION_PURCHASE_DISCOUNT**
Changed to perform additional validations when backdating a discount purchase. See "How discounts are purchased" in BRM Managing Customers.

There are no changes to this opcode's input and output flists.

**PCM_OP_SUBSCRIPTION_PURCHASE_PRODUCT**
Changed to perform additional validations when backdating a product purchase. See "How products are purchased" in BRM Managing Customers.

There are no changes to this opcode's input and output flists.

**PCM_OP_SUBSCRIPTION_READ_ACCT_PRODUCTS**
Changed to retrieve the alias list of the services.

**New output fields**
- PIN_FLD_DEALS array.
- PIN_FLD_SERVICES array.
  - PIN_FLD_ALIAS_LIST array.

**PCM_OP_SUBSCRIPTION_SERVICE_BALGRP_TRANSFER**
**New input fields**
- PIN_FLD_PAYINFO array:
  - PIN_FLD_FLAGS.

**PCM_OP_SUBSCRIPTION_SET_DISCOUNTINFO**
Changed to perform additional validations when backdating the discount's purchase, cycle, or usage start and end dates to a backdated date. See "Setting Discount Purchase, Cycle, and Usage Start and End Times" in BRM Managing Customers.

There are no changes to this opcode's input and output flists.

**PCM_OP_SUBSCRIPTION_SET_DISCOUNT_STATUS**
Changed to perform additional validations when backdating the discount status change. See "How BRM changes discount status" in BRM Managing Customers.

There are no changes to this opcode's input and output flists.

**PCM_OP_SUBSCRIPTION_PROVISION_ERA**
**New input fields**
- PIN_FLD_STR_VAL.

**PCM_OP_SUBSCRIPTION_SET_PRODINFO**
Changed to perform additional validations when backdating the product's purchase, cycle, or usage start and end dates to a backdated date. See "Changing the purchase, usage, and cycle start and end times" in BRM Managing Customers.

**Removed input fields**
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_PURCHASE_END_DETAILS.
  - PIN_FLD_CYCLE_END_DETAILS.
- PIN_FLD_USAGE_END_DETAILS.

**PCM_OP_SUBSCRIPTION_SET_PRODUCT_STATUS**

Changed to perform additional validations when backdating the product status change. See "How BRM changes product status" in *BRM Managing Customers*.

There are no changes to this opcode's input and output flists.

**PCM_OP_SUBSCRIPTION_TRANSFER_SUBSCRIPTION**

Changed to return the POIDs of the products and discounts in both the old and new subscriber accounts affected by the transfer.

**New input fields**

- PIN_FLD_PAYINFO array:
  - PIN_FLD_FLAGS.

**New output fields**

- PIN_FLD_ACTION_INFO array.

**PCM_OP_SUBSCRIPTION_TRANSITION_PLAN**

Changed to support the following feature:

- Enabling credit thresholds to be set to a fixed value, such as 50 minutes or $90. See "About credit thresholds and credit floors" in *BRM Setting Up Pricing and Rating*.

**New input fields**

- PIN_FLD_LIMIT array.
  - PIN_FLD_THRESHOLDS array.

**Changed input fields**

- PIN_FLD_FROM_SERVICE and PIN_FLD_TO_SERVICE substructs in the PIN_FLD_SERVICES array are now optional.

**Removed input fields**

- PIN_FLD_LIMIT array.

**Voucher Manager FM Standard Opcodes**

The following are the changes made to Voucher Manager FM standard opcodes in BRM 7.4.

**PCM_OP_VOUCHER_ASSOCIATE_VOUCHER**

Changed to record tax information for voucher top-ups with tax.

**New output fields**

- PIN_FLD_SUB_BAL_IMPACTS array
- PIN_FLD_TAX_JURISDICTIONS array

**Renamed Opcodes**

There are no renamed opcodes in BRM 7.4.
Utility Changes from BRM 7.3.1 to BRM 7.4

This document provides upgrade impacts information for Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1 to BRM 7.4. It describes the utility changes that affect your BRM system, and what you need to consider when you upgrade from 7.3.1 to 7.4.

See "About Upgrading BRM Releases" for information on planning your upgrade implementation, such as setting up your development and test environments.

**Changed Utilities**

Table 5–1 describes utilities that were changed between BRM 7.3.1 and BRM 7.4 releases.

<table>
<thead>
<tr>
<th>Changed Utility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>rad_tester</td>
<td>You can use rad_tester to simulate sending AAA requests to the RADIUS server. In addition, a new packet, update_pkt.sample, has been created to support interim accounting requests. You use this packet along with rad_tester to simulate update accounting requests from the NAS.</td>
</tr>
</tbody>
</table>
This document provides upgrade impact information for Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1 to BRM 7.4. It describes the Pipeline Manager EDR changes that affect your BRM system and what you need to consider when you upgrade from 7.3.1 to 7.4.

See "About Upgrading BRM Releases" for information on planning your upgrade implementation, such as setting up your development and test environments.

Changed Pipeline Manager Modules

Table 6–1 lists Pipeline Manager modules that were changed between BRM 7.3.1 release and BRM 7.4.

Table 6–1  Changed Pipeline Manager Modules in 7.4

<table>
<thead>
<tr>
<th>Changed module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“DAT_PortalConfig”</td>
<td>This module includes the following new semaphore entries:</td>
</tr>
<tr>
<td></td>
<td>■ CreditProfilePrintData</td>
</tr>
<tr>
<td></td>
<td>■ CreditProfileReload</td>
</tr>
<tr>
<td></td>
<td>See “Semaphore File Entries” in BRM Configuring Pipeline Rating and Discounting.</td>
</tr>
<tr>
<td>“FCT_ApplyBalance”</td>
<td>This module includes the following new registry entries:</td>
</tr>
<tr>
<td></td>
<td>■ PortalConfigDataModule</td>
</tr>
<tr>
<td></td>
<td>■ OutputPrefix</td>
</tr>
<tr>
<td></td>
<td>■ OutputDirectory</td>
</tr>
<tr>
<td></td>
<td>■ NumberOfNotificationLimit</td>
</tr>
<tr>
<td></td>
<td>See “Registry Entries” in BRM Configuring Pipeline Rating and Discounting.</td>
</tr>
<tr>
<td>&quot;FCT_Discount&quot;</td>
<td>Enhanced to support non-duration resources for prepaid credit limit checks.</td>
</tr>
<tr>
<td></td>
<td>See “About Credit Limit Checks in the Real-Time Discounting Pipeline” in BRM Telco Integration.</td>
</tr>
</tbody>
</table>

New BRM EDR Container Fields

The following tables list the new BRM EDR container fields for the following entities:

- Associated CAMEL Extension Record
- Associated Roaming Extension Record
- Associated Suspense Extension Record
- Charge Breakdown Record Tax Packet
- Header Record
- Supplementary Charge Packet Record
- Total Advised Charge Value List

**Associated CAMEL Extension Record**

Table 6–2 describes the associated CAMEL Extension Record.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXCHANGE_RATE</td>
<td>Decimal</td>
<td>Contains the exchange rate which has been used to convert the Incoming currency to the internal currency.</td>
</tr>
</tbody>
</table>

**Associated Roaming Extension Record**

Table 6–3 describes the associated Roaming Extension Record.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP_CURRENCY</td>
<td>String</td>
<td>Currency used for TAP3 and TAP 311.</td>
</tr>
</tbody>
</table>

**Associated Suspense Extension Record**

Table 6–4 describes the associated Suspense Extension Record.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RECYCLING_MODE</td>
<td>Integer</td>
<td>Mandatory. Calculated. Equal to DETAIL.INTERN_PROCESS_STATUS</td>
</tr>
</tbody>
</table>

**Charge Breakdown Record Tax Packet**

Table 6–5 describes the charge breakdown record tax packet.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARGE_INFORMATION_COUNTER</td>
<td>Integer</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>CHARGE_INFORMATION_COUNTER</td>
<td>Integer</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Header Record**

Table 6–6 describes the header record.
Table 6–6  Header Record Names

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAP_FILE_TYPE</td>
<td>String</td>
<td>Type of TAP file, TAP3 or TAP311.</td>
</tr>
</tbody>
</table>

Supplementary Charge Packet Record

Table 6–7 describes the supplementary charge packet record.

Table 6–7  Supplementary Charge Packet Record Names

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARGE_REFUND_INDICATOR</td>
<td>Integer</td>
<td>Optional. Charge refund indicator item.</td>
</tr>
</tbody>
</table>

Total Advised Charge Value List

Table 6–8 describes the total advised charge value list.

Table 6–8  Total Advised Charge Value List Names

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL ADVISEDCHARGE</td>
<td>Decimal</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL ADVISEDCHARGE_REFUND</td>
<td>Decimal</td>
<td>-</td>
</tr>
<tr>
<td>ADVISED_CHARGE_CURRENCY</td>
<td>String</td>
<td>Optional. AdvisedChargeCurrency item.</td>
</tr>
<tr>
<td>TOTAL_COMMISSION</td>
<td>Decimal</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL_COMMISSION_REFUND</td>
<td>Decimal</td>
<td>-</td>
</tr>
</tbody>
</table>

New AAA EDR Container Fields

Table 6–9 lists the new function module fields.

New Function Module Fields

Table 6–9  New Function Module Fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESSION_ID</td>
<td>String</td>
<td>Timer id needed to cancel the timer Required by FCT_Timer.</td>
</tr>
<tr>
<td>REACTOR_IDPRE</td>
<td>Integer</td>
<td>Internal Field: 1st part of the reactor’s address</td>
</tr>
<tr>
<td>REACTOR_IDPOST</td>
<td>Integer</td>
<td>Internal Field: 2nd part of the reactor’s address</td>
</tr>
<tr>
<td>A_NUMBER</td>
<td>String</td>
<td>Specifies the event originator. Used for number portability.</td>
</tr>
<tr>
<td>B_NUMBER</td>
<td>String</td>
<td>Specifies the event receiver. Used for number portability.</td>
</tr>
</tbody>
</table>
The AAA EDR container has been changed as follows:

- Input and output blocks for the following TCF AAA opcodes have been added:
  - PCM_OP_TCF_AAA_AUTHENTICATE
  - PCM_OP_TCF_AAA_AUTHORIZE
  - PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE
  - PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION
  - PCM_OP_TCF_AAA_STOP_ACCOUNTING
  - PCM_OP_TCF_AAA_START_ACCOUNTING
  - PCM_OP_TCF_AAA_UPDATE_ACCOUNTING
  - PCM_OP_TCF_AAA_QUERY_BALANCE
  - PCM_OP_TCF_AAA_SERVICE_PRICE_ENQUIRY
  - PCM_OP_TCF_AAA_ACCOUNTING_ON
  - PCM_OP_TCF_AAA_ACCOUNTING_OFF

- Input and output blocks for the following GSM AAA opcodes have been removed:
  - PCM_OP_GSM_AAA_AUTHORIZE
  - PCM_OP_GSM_AAA_UPDATE_ACCOUNTING
  - PCM_OP_GSM_AAA_REAUTHORIZE
  - PCM_OP_GSM_AAA_UPDATE_AND_REAUTHORIZE
  - PCM_OP_GSM_AAA_AUTHENTICATE
  - PCM_OP_GSM_AAA_CANCEL_AUTHORIZATION

### Table 6–9 (Cont.) New Function Module Fields

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARGING_START_TIMESTAMP</td>
<td>Date</td>
<td>Specifies the event charging timestamp. Used for number portability.</td>
</tr>
<tr>
<td>SOURCE_NETWORK</td>
<td>String</td>
<td>Specifies the source network. This can either be the PLMN ID or any logical operator code. Used for number portability.</td>
</tr>
<tr>
<td>SOURCE_NETWORK_TYPE</td>
<td>String</td>
<td>Optional. Specifies the source network type, for example GSM 900. Used for number portability.</td>
</tr>
<tr>
<td>DESTINATION_NETWORK</td>
<td>String</td>
<td>Specifies the network to which an event is routed. Used for number portability.</td>
</tr>
<tr>
<td>DESTINATION_NETWORK_TYPE</td>
<td>String</td>
<td>Optional. Specifies the destination network type, for example GSM 900. Used for number portability.</td>
</tr>
<tr>
<td>IGNORE_NP</td>
<td>Integer</td>
<td>State variable to indicate NP data needs to be looked up. Used for number portability.</td>
</tr>
</tbody>
</table>

**Changed Opcode Blocks**

The AAA EDR container has been changed as follows:

- Input and output blocks for the following TCF AAA opcodes have been added:
  - PCM_OP_TCF_AAA_AUTHENTICATE
  - PCM_OP_TCF_AAA_AUTHORIZE
  - PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE
  - PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION
  - PCM_OP_TCF_AAA_STOP_ACCOUNTING
  - PCM_OP_TCF_AAA_START_ACCOUNTING
  - PCM_OP_TCF_AAA_UPDATE_ACCOUNTING
  - PCM_OP_TCF_AAA_QUERY_BALANCE
  - PCM_OP_TCF_AAA_SERVICE_PRICE_ENQUIRY
  - PCM_OP_TCF_AAA_ACCOUNTING_ON
  - PCM_OP_TCF_AAA_ACCOUNTING_OFF

- Input and output blocks for the following GSM AAA opcodes have been removed:
  - PCM_OP_GSM_AAA_AUTHORIZE
  - PCM_OP_GSM_AAA_UPDATE_ACCOUNTING
  - PCM_OP_GSM_AAA_REAUTHORIZE
  - PCM_OP_GSM_AAA_UPDATE_AND_REAUTHORIZE
  - PCM_OP_GSM_AAA_AUTHENTICATE
  - PCM_OP_GSM_AAA_CANCEL_AUTHORIZATION
- PCM_OP_GSM_AAA_START_ACCOUNTING
- PCM_OP_GSM_AAA_STOP_ACCOUNTING
- PCM_OP_GSM_AAA_ACCOUNTING_ON
- PCM_OP_GSM_AAA_ACCOUNTING_OFF
This document provides upgrade impact information for Oracle Communications Billing and Revenue Management (BRM) 7.3.1 to BRM Release 7.4. It describes the notification event changes that affect your BRM system, and what you need to consider when you upgrade from 7.3.1 to 7.4.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

**Changed Notification Events**

Table 7–1 lists all notification events that were modified between BRM 7.3.1 and BRM 7.4.
### Table 7–1  Changed Notification Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/event/notification/thresh</td>
<td>The following fields were added to the PIN_FLD_BALANCES substruct:</td>
</tr>
<tr>
<td>old</td>
<td>- PIN_FLD_CURRENT_BAL-The current balance after the amount was impacted. Applicable only when applying balance impacts.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_FLOOR-The baseline for calculating percentage for threshold triggers. Credit floor does not enforce any limits on current balance.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_LIMIT-The limit for this resource. Current balance cannot exceed this limit unless the current balance is affected by a limit override rate or manually adjusted by a CSR.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_THRESHOLDS_FIXED-A list of separated threshold amounts, in ascending order, to trigger when the resource balance crosses a boundary when the value is increasing.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_EVENT_TYPE-The type of event against which this notification was raised.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CALLING_NUMBER-The originating phone number of the call. Usually, this is the MSISDN number, but can be different; for example, in case of a calling card scenario. This is also called the A number.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CALLED_NUMBER-The destination number of the call. This is also called the B number.</td>
</tr>
<tr>
<td>/event/notification/thresh</td>
<td>The following fields were added to the PIN_FLD_THRESHOLDS array:</td>
</tr>
<tr>
<td>old_below</td>
<td>- PIN_FLD_ALERT_TYPE-The threshold’s alert type: Limit (1), or Percent Threshold (2), or Floor (3), or Fixed Thresholds (4).</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_REASON-The reason for this breach: Upward Breach (0x01), Downward Breach (0x02), Upward Reset (0x04), Downward Reset (0x08), Indeterminate (0x10).</td>
</tr>
<tr>
<td>/event/notification/thresh</td>
<td>The following fields were added to the PIN_FLD_BALANCES substruct:</td>
</tr>
<tr>
<td>old_below</td>
<td>- PIN_FLD_CURRENT_BAL-The current balance after the amount was impacted. Applicable only when applying balance impacts.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_FLOOR-The baseline for calculating percentage for threshold triggers. The credit floor does not enforce any limits on current balance.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_LIMIT-The limit for this resource. Current balance cannot exceed this limit unless the current balance is affected by a limit override rate or manually adjusted by a CSR.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CREDIT_THRESHOLDS_FIXED-A list of separated threshold amounts, in ascending order, to trigger when the resource balance crosses a boundary when the value is increasing.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_EVENT_TYPE-The type of event against which this notification was raised.</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_CALLING_NUMBER-The originating phone number of the call. Usually, this is the MSISDN number, but can be different; for example, in case of a calling card scenario. This is also called the A number.</td>
</tr>
<tr>
<td></td>
<td>- STRING PIN_FLD_CALLING_NUMBER-The destination number of the call. This is also called the B number.</td>
</tr>
<tr>
<td></td>
<td>The following fields were added to the PIN_FLD_THRESHOLDS array:</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_ALERT_TYPE-The threshold’s alert type: Limit (1), or Percent Threshold (2), or Floor (3), or Fixed Thresholds (4).</td>
</tr>
<tr>
<td></td>
<td>- PIN_FLD_REASON-The reason for this breach: (0x01) Upward Breach, or (0x02) Downward Breach, or (0x04) Upward Reset, or (0x08) Downward Reset, or (0x10) Indeterminate.</td>
</tr>
</tbody>
</table>
This document provides upgrade impacts information for Portal™ Release 7.3 to Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1. It describes the storable class changes that affect your Portal system, and what you need to consider when you upgrade from 7.3 to 7.3.1. It also provides information about storable class index and schema changes.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

**Changed Storable Classes**

Table 8–1 lists all storable classes that were changed between Portal 7.3 and BRM 7.3.1.

<table>
<thead>
<tr>
<th>Changed Storable Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/event/customer/billinfo</td>
<td>The following fields were added:</td>
</tr>
<tr>
<td></td>
<td>■ PIN_FLD_LAST_BILL_T stores the date that the current billing cycle started and the previous billing cycle ended.</td>
</tr>
<tr>
<td></td>
<td>■ PIN_FLD_FUTURE_BILL stores the date that the future billing cycle ends.</td>
</tr>
</tbody>
</table>
Feature Changes from Portal 7.3 to BRM 7.3.1

This document provides upgrade impacts information for Portal™ Release 7.3 to Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1. It describes the feature changes that affect your Portal system, and what you need to consider when you upgrade from 7.3 to 7.3.1.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

AAA Gateway Manager Changes

This section discusses the changes made to the AAA Gateway Manager from Portal release 7.3 to BRM 7.3.1.

MBI Protocol Support

AAA Gateway Manager now supports the new versions of the message-based interface (MBI) protocol: HP-MBI protocol version 1.29 and HP-OCSAC CDR version 1.19. New message types are supported and changes have been made to the existing grammar to support the new versions of the MBI protocol.

GSM Requests-to-Opcode Mapping Changes

The GSM requests are now mapped to the Services Framework AAA opcodes instead of to the GSM AAA opcodes. GSM-specific data are included in the EXTENDED_INFO block of the Services Framework AAA block.

Table 9–1 shows GSM requests-to-opcode mapping changes.

<table>
<thead>
<tr>
<th>GSM Request</th>
<th>Opcode Called</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authorize_req</td>
<td>PCM_OP_TCF_AAA_AUTHORIZE</td>
</tr>
<tr>
<td>Authorize_conf</td>
<td></td>
</tr>
<tr>
<td>Authorize_reject</td>
<td></td>
</tr>
<tr>
<td>Reauthorize_req</td>
<td>PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE</td>
</tr>
<tr>
<td>End_req</td>
<td>PCM_OP_TCF_AAA_STOP_ACCOUNTING</td>
</tr>
<tr>
<td>End_ack</td>
<td>If the reason for terminating the call is DESTINATION_BUSY, NO_ANSWER, CALLER_ABANDON, or SMS_FAILURE, PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION is called.</td>
</tr>
</tbody>
</table>
MBI Administrative Messages-to-Opcode Mapping Changes

The following MBI administrative messages are mapped to Services Framework AAA opcodes with the service type set to /service/telco to close all open sessions irrespective of the service sub-type:

Table 9–2 shows MBI Administrative messages-to-opcode mapping changes.

<table>
<thead>
<tr>
<th>MBI Administrative Request</th>
<th>Opcode Called</th>
</tr>
</thead>
<tbody>
<tr>
<td>StartUp_req</td>
<td>PCM_OP_TCF_AAA_ACCOUNTING_ON</td>
</tr>
<tr>
<td>StartUp_res</td>
<td></td>
</tr>
<tr>
<td>ShutDown_req</td>
<td>PCM_OP_TCF_AAA_ACCOUNTING_OFF</td>
</tr>
<tr>
<td>ShutDown_res</td>
<td></td>
</tr>
</tbody>
</table>

MBI Grammar and Mapping File Changes

The existing grammar and mapping files in the Pipeline_HOME/formatDesc/Formats/MBI directory have been renamed as follows:

Table 9–3 shows MBI Grammar and Mapping File changes.

<table>
<thead>
<tr>
<th>Old Name</th>
<th>New Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBI_v1.10_InGrammar.dsc</td>
<td>MBI_v1_InGrammar.dsc</td>
</tr>
<tr>
<td>MBI_v1.10_InMap.dsc</td>
<td>MBI_v1_InMap.dsc</td>
</tr>
<tr>
<td>MBI_v1.10.dsc</td>
<td>MBI_v1.dsc</td>
</tr>
<tr>
<td>MBI_v1.10_OutGrammar.dsc</td>
<td>MBI_v1_OutGrammar.dsc</td>
</tr>
<tr>
<td>MBI_v1.10_OutMap.dsc</td>
<td>MBI_v1_OutMap.dsc</td>
</tr>
<tr>
<td>MBI_v1.10_InGrammar.dsc</td>
<td>MBI_v1_InGrammar.dsc</td>
</tr>
</tbody>
</table>

MBI CDR Grammar and Mapping File Changes

The existing grammar and mapping files in the Pipeline_HOME/formatDesc/Formats/MBI_CDR directory have been renamed as follows:

Table 9–4 shows MBI CDR Grammar and Mapping File changes.

<table>
<thead>
<tr>
<th>Old Name</th>
<th>New Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCSAC_CDR_2.0_InGrammar.dsc</td>
<td>OCSAC_CDR_v1_InGrammar.dsc</td>
</tr>
<tr>
<td>OCSAC_CDR_2.0_InMap.dsc</td>
<td>OCSAC_CDR_v1_InMap.dsc</td>
</tr>
<tr>
<td>OCSAC_CDR_2.0.dsc</td>
<td>OCSAC_CDR_v1.dsc</td>
</tr>
</tbody>
</table>

EDR Container Changes

To map MBI requests to the Services Framework AAA opcodes, the AAA EDR container has been changed as follows:

- Input and output blocks for the following Services Framework AAA opcodes have been added:
Pipeline Manager Changes

Feature Changes from Portal 7.3 to BRM 7.3.1

- PCM_OP_TCF_AAA_AUTHORIZE
- PCM_OP_TCF_AAA_UPDATE_AND_REAUTHORIZE
- PCM_OP_TCF_AAA_STOP_ACCOUNTING
- PCM_OP_TCF_AAA_CANCEL_AUTHORIZATION
- PCM_OP_TCF_AAA_ACCOUNTING_ON
- PCM_OP_TCF_AAA_ACCOUNTING_OFF

- GSM-specific data has been added in the EXTENDED_INFO.GSM_INFO block.
- GPRS-specific data has been added in the EXTENDED_INFO.GPRS_INFO block.

---

**Note:** The AAA EDR container includes input and output blocks for GSM AAA opcodes to support GSM requests in Diameter protocol and flist format, which are mapped to GSM AAA opcodes.

---

The ASS_MBI_INFO and ASS_OCSAC_INFO blocks have been enhanced to support additional fields defined in the MBI v1.29 specification and the OCSAC CDR v1.19 specification respectively.

**Changes to the MBI Registry File**

By default, the `ServicesSupported` entry in the `mbi.reg` file is commented. By default, all telco services (`/service/telco`) are supported. If you want to support only a specific service, for example GSM service, you can uncomment the `ServicesSupported` entry and specify a service, for example `/service/telco/gsm`.

**Timeout and Replay Pipeline Changes**

The following iScripts and iRules used by the Timeout and Replay pipelines have been modified to map requests to Services Framework AAA opcodes:

- ISC_GenericPostOpcode
- ISC_TimeoutDefaultResponse
- ISC_TimeoutPreZone
- ISC_TimeoutProcessedResponse
- ISC_ReplayPostOpcode
- IRL_ReplayRouter
- IRL_TimeoutRouter
- IRL_Router

**Note:** These iScripts and iRules map also to GSM AAA opcodes to support requests in Diameter protocol and flist format.

---

**Pipeline Manager Changes**

This section discusses the changes made to the Pipeline Manager from Portal release 7.3 to BRM 7.3.1.
Pipeline Manager Uses Business Parameter Settings from the BRM Database

Pipeline Manager now uses business parameter settings (/config/business_params) from the BRM database rather than pipeline registry entries to determine whether optional BRM features and functionality are enabled. The DAT_PortalConfig module has been enhanced to retrieve business parameter settings from the BRM database at pipeline initialization and store them in internal memory. Other data modules that require business parameter settings retrieve them directly from the DAT_PortalConfig module’s memory. For more information, see “Using Business Parameter Settings from the BRM Database” in BRM System Administrator’s Guide.

Taxation Changes

BRM no longer supports Vertex CommTax21. Vertex Communications Tax Q Series is now supported. Vertex plans to discontinue support for CommTax21 in the near future.

Communications Tax Q Series does not support the customization of DM Vertex to collect extra data. If you added or uncommented the extra_tax_data entry in the Vertex DM configuration file (BRM_Homelsys/dm_vertex/pin.conf), you should remove that entry.

In addition, Vertex Quantum is now called Vertex Sales Tax Q Series.

The names of the two BRM Vertex managers are unchanged:

- Vertex Manager - Supports Vertex Sales Tax Q Series and Vertex Communications Tax Q Series.
- Vertex Quantum Manager - Supports Vertex Sales Tax Q Series. This manager does not support Vertex Communications Tax Q Series.

Configuration file (pin.conf) entries and package names related to Sales Tax Q Series continue to include “Quantum.”

Telco Framework Changes

This section discusses the changes made to the Telco Framework (Services Framework) from Portal release 7.3 to BRM 7.3.1.

Telco Framework Renamed to Services Framework

Telco Framework (TCF) has been renamed to Services Framework. Likewise, TCF Manager has been renamed to Services Framework Manager, and TCF AAA Manager has been renamed Services Framework AAA Manager.

---

Note: The Services Framework opcodes, objects, and utilities still continue to have “TCF” in their names.

---
Notification Event Changes from Portal 7.3 to BRM 7.3.1

This document provides upgrade impacts information for Portal™ Release 7.3 to Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1. It describes the notification event changes that affect your Portal system, and what you need to consider when you upgrade from 7.3 to 7.3.1.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

### Changed Notification Events

**Table 10–1** lists all notification events that were modified between Portal 7.3 and BRM 7.3.1.

<table>
<thead>
<tr>
<th>Changed Notification Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>/event/notification/price/discounts/modify</td>
<td>Several new fields were added so that additional discount details can be provided to external customer relationship management (CRM) systems. See “About the Data Synchronization Process” in BRM Synchronization Queue Manager.</td>
</tr>
<tr>
<td>/event/notification/price/products/modify</td>
<td>Several new arrays and fields were added so that additional product details can be provided to external customer relationship management (CRM) systems. See “About the Data Synchronization Process” in BRM Synchronization Queue Manager.</td>
</tr>
</tbody>
</table>
Opcode Changes from Portal 7.3 to BRM 7.3.1

This document describes the opcode changes that affect your Portal™ system and what you need to consider when you upgrade from Portal 7.3 to Oracle Communications Billing and Revenue Management (BRM) 7.3.1.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

---

**Note:** Not all opcode changes were caused by feature enhancements. When appropriate, the feature that caused a change is provided in the opcode description.

---

**Changed Policy Opcodes**

The following policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**Activity FM Policy Opcodes**

The following Activity FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_ACT_POL_CONFIG_BILLING_CYCLE**

- Removed input fields
  - PIN_FLD_ACCOUNT_OBJ

**PCM_OP_ACT_POL_PRE_AUTHORIZE**

- Removed output fields
  - PIN_FLD_FLAG_TRY_CALC_MAX

**PCM_OP_ACT_POL_PRE_REAUTHORIZE**

- Removed output fields
  - PIN_FLD_FLAG_TRY_CALC_MAX

**PCM_OP_ACT_POL_SPEC_EVENT_CACHE**

- Changed input fields
  - PIN_FLD_ITEM_OBJ in the PIN_FLD_BAL_IMPACTS array is now mandatory.

- Removed input fields
  - PIN_FLD_NAME
Accounts Receivable FM Policy Opcodes
The following Accounts Receivable FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_AR_POL_REVERSE_WRITEOFF**
*Removed input fields*
- PIN_FLD_SESSION_OBJ
- PIN_FLD_DESCR
- PIN_FLD_START_T
- PIN_FLD_END_T

*New output fields*
- PIN_FLD_PROGRAM_NAME

Billing FM Policy Opcodes
The following billing policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_BILL_POL_BILL_PRE_COMMIT**
*Removed input fields*
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_BILL_OBJ

**PCM_OP_BILL_POL_CHECK_SUBPRESSION**
*Changed input fields*
- PIN_FLD_STATUS is now mandatory
PCM_OP_BILL_POL_EVENT_SEARCH
Changed input fields
- PIN_FLD_ITEM_OBJ_INFO array is now PIN_FLD_ITEMS array.

Changed output fields
- PIN_FLD_RESOURCE_ID in the PIN_FLD_BAL_IMPACTS array is now optional.

PCM_OP_BILL_POL_GET_PENDING_ITEMS
New input fields
- PIN_FLD_ITEMS array

Changed input fields
- PIN_FLD_PAY_TYPE is now optional
- PIN_FLD_ACTG_NEXT_T is now optional

Removed input fields
- PIN_FLD_END_T
- PIN_FLD_BILL_WHEN
- PIN_FLD_BILL_ACTGCYCLES_LEFT
- PIN_FLD_FLAGS
- PIN_FLD_ITEMS array

New output fields
- PIN_FLD_RESULTS array:
  - PIN_FLD_RECVD
  - PIN_FLD_BILL_OBJ

Changed output fields
- PIN_FLD_RESULTS array is now optional

PCM_OP_BILL_POL_POST_BILLING
New input fields
- PIN_FLD_OPEN_BAL
- PIN_FLD_PENDING_BAL

Changed input fields
- PIN_FLD_BILL_TYPE was replaced by PIN_FLD_PAY_TYPE optional field.

Removed input fields
- PIN_FLD_END_T

Removed output fields
- PIN_FLD_ACTG_NEXT_T

PCM_OP_BILL_POL_SPEC_BILLNO
Changed input fields
- PIN_FLD_BILL_TYPE is now PIN_FLD_PAY_TYPE.
- PIN_FLD_NAME is now mandatory.
• PIN_FLD_PARENT is now the PIN_FLD_BILLINFO_OBJ mandatory field.

**Removed input fields**
• PIN_FLD_CREATED_T
• PIN_FLD_MOD_T
• PIN_FLD_CURRENCY
• PIN_FLD_TOTAL_DUE

**Changed output fields**
• PIN_FLD_NAME is now mandatory.
• PIN_FLD_PARENT is now the PIN_FLD_BILLINFO_OBJ mandatory field.

**Removed output fields**
• PIN_FLD_CREATED_T
• PIN_FLD_MOD_T
• PIN_FLD_CURRENCY
• PIN_FLD_TOTAL_DUE

**PCM_OP_BILL_POL_SPEC_FUTURE_CYCLE**

**Changed input fields**
• PIN_FLD_BILL_TYPE is now PIN_FLD_PAY_TYPE.

**Removed input fields**
• PIN_FLD_ACTG_LAST_T
• PIN_FLD_ACTG_FUTURE_T
• PIN_FLD_BILL_WHEN
• PIN_FLD_BILL_ACTGCYCLES_LEFT
• PIN_FLD_ACTG_FUTURE_DOM

**PCM_OP_BILL_POL_VALID_TRANSFER**

**Removed input fields**
• PIN_FLD_DESCR
• PIN_FLD_PROGRAM_NAME
• PIN_FLD_START_T
• PIN_FLD_END_T
• PIN_FLD_ITEMS array:
  – PIN_FLD_ITEM_OBJ
  – PIN_FLD_AMOUNT
  – PIN_FLD_CURRENCY

**PCM_OP_CONTENT_POL_ACCOUNTING**

**Removed input fields**
• PIN_FLD_OBJ_TYPE
Removed output fields
- PIN_FLD_OBJ_TYPE

**PCM_OP_CONTENT_POL_AUTHORIZE**

New output fields
- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_CONTENT_POL_POST_ACCOUNTING**

Changed input fields
- PIN_FLD_CONTENT_PROVIDER_ID is now optional.
- PIN_FLD_CONTENT_CATEGORY_NAME is now optional.
- PIN_FLD_DESCR is now mandatory.
- PIN_FLD_END_T is now mandatory.

**PCM_OP_CONTENT_POL_RESOLVE_EVENT_EXTENSIONS**

New output fields
- PIN_FLD_EXTENDED_DATA array

Removed output fields
- PIN_FLD_OBJ_TYPE
- PIN_FLD_EXTENDED_INFO

**Customer FM Policy Opcodes**

The following customer FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_CUST_POL_CANONICALIZE**

Changed input fields
- PIN_FLD_STR_VALS array is now optional.

Changed output fields
- PIN_FLD_STR_VALS array is now optional.

**PCM_OP_CUST_POL_GET_CONFIG**

Removed input fields
- PIN_FLD_NAME
- PIN_FLD_DESCR
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_BAL_INFO array
- PIN_FLD_SERVICES array
- PIN_FLD_NAMEINFO array

Removed output fields
- PIN_FLD_BAL_INFO array
**PCM_OP_CUST_POL_GET_DB_LIST**

New output fields

- PIN_FLD_VERSION
- PIN_FLD_VALUE
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_NAME
- PIN_FLD_HOSTNAME
- PIN_FLD_DESCR
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_WRITE_ACCESS
- PIN_FLD_READ_ACCESS
- PIN_FLD_MOD_T
- PIN_FLD_CREATED_T

**PCM_OP_CUST_POL_GET_DB_NO**

New input fields

- PIN_FLD_BILLINFO array
- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_SERVICES array

**PCM_OP_CUST_POL_GET_DEALS**

Changed output fields

- PIN_FLD_PRODUCTS array is now optional.

**PCM_OP_CUST_POL_GET_PLANS**

Removed input fields

- PIN_FLD_AAC_SOURCE
- PIN_FLD_AAC_VENDOR
- PIN_FLD_AAC_PACKAGE
- PIN_FLD_AAC_PROMO_CODE
- PIN_FLD_AAC_SERIAL_NUM

**PCM_OP_CUST_POL_POST_COMMIT**

New input fields

- PIN_FLD_ACCTINFO array

Changed input fields

- PIN_FLD_BILLINFO array is now PIN_FLD_BILLINFO_OBJ
- PIN_FLD_AAC_ACCESS was moved into the PIN_FLD_ACCTINFO array.
- PIN_FLD_AAC_SOURCE was moved into the PIN_FLD_ACCTINFO array.
**PCM_OP_CUST_POL_PRE_COMMIT**

**New input fields**
- PIN_FLD_ACCTINFO array
- PIN_FLD_BILLINFO array:
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_AR_BILLINFO_OBJ
  - PIN_FLD_PARENT_BILLINFO_OBJ
  - PIN_FLD_CURRENCY_SECONDARY
  - PIN_FLD_BILLING_SEGMENT
  - PIN_FLD_EFFECTIVE_T
- PIN_FLD_PAYINFO array:
  - PIN_FLD_POID
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_PAYMENT_TERM
  - PIN_FLD_PAYMENT_OFFSET
  - PIN_FLD_INV_TYPE
- PIN_FLD_INHERITED_INFO substruct in the PIN_FLD_PAYINFO array:
  - PIN_FLD_INV_INFO array
  - PIN_FLD_CC_INFO array
  - PIN_FLD_DD_INFO array
  - PIN_FLD_BAL_INFO array

**Changed input fields**
- The following fields were moved into the PIN_FLD_ACCTINFO array:
  - PIN_FLD_DEAL_OBJ
  - PIN_FLD_AAC_ACCESS
  - PIN_FLD_AAC_SOURCE
  - PIN_FLD_AAC_VENDOR
  - PIN_FLD_AAC_PACKAGE
  - PIN_FLD_AAC_PROMO_CODE
  - PIN_FLD_AAC_SERIAL_NUM
- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- The following fields in PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY
- PIN_FLD_TYPE in the PIN_FLD_PHONES array in the PIN_FLD_NAMEINFO array is now optional.
- PIN_FLD_LIMIT array was moved into PIN_FLD_BAL_INFO array.

**Removed input fields**
- PIN_FLD_BILLINFO array:
  - PIN_FLD_MERCHANT
  - PIN_FLD_BILL_MODE
  - PIN_FLD_BILL_TYPE
  - PIN_FLD_PARENT
  - PIN_FLD_ACCESS_CODE1
  - PIN_FLD_ACCESS_CODE2
- PIN_FLD_NAMEINFO_INDEX in the PIN_FLD_PAYINFO array.

**PCM_OP_CUST_POL_PREP_ACCTINFO**
**Removed input fields**
- PIN_FLD_BAL_INFO array

**Changed output fields**
- PIN_FLD_ACTG_TYPE in the PIN_FLD_ACCTINFO array is now optional.

**Removed output fields**
- PIN_FLD_BAL_INFO array

**PCM_OP_CUST_POL_PREP_LOCALE**
**Changed output fields**
- PIN_FLD_LOCALE is now optional.

**PCM_OP_CUST_POL_PREP_NAMEINFO**
**New output fields**
- PIN_FLD_CANON_COUNTRY in the PIN_FLD_NAMEINFO array.

**PCM_OP_CUST_POL_PREP_STATUS**
**New input fields**
- PIN_FLD_BILLINFO_OBJ
- PIN_FLD_END_T
- PIN_FLD_CLOSE_WHEN_T

**New output fields**
- PIN_FLD_BILLINFO_OBJ
- PIN_FLD_END_T

**Changed output fields**
- PIN_FLD_CLOSE_WHEN_T is now mandatory.
PCM_OP_CUST_POL_SET_BRANDINFO
New output fields
- PIN_FLD_FLD_FIELD array in the PIN_FLD_FIELD array.
Removed output fields
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

PCM_OP_CUST_POL_TAX_CALC
New input fields
- PIN_FLD_COMMAND
- PIN_FLD_ROUNDING
- PIN_FLD_ROUNDING_MODE
Removed input fields
- PIN_FLD_COMMAND in the PIN_FLD_TAXES array.
New output fields
- PIN_FLD_TAXPKG_TYPE in the PIN_FLD_TAXES array.
Changed output fields
- PIN_FLD_SUBTOTAL array is now mandatory.
- PIN_FLD_LOCATION_MODE in the PIN_FLD_SUBTOTAL array is now mandatory.
Removed output fields
- PIN_FLD_TAXPKG_TYPE

PCM_OP_CUST_POL_TRANSITION_DEALS
New output fields
- PIN_FLD_PURCHASE_START_DETAILS
- PIN_FLD_PURCHASE_END_DETAILS
- PIN_FLD_CYCLE_START_DETAILS
- PIN_FLD_CYCLE_END_DETAILS
- PIN_FLD_USAGE_START_DETAILS
- PIN_FLD_USAGE_END_DETAILS
- PIN_FLD_STATUS
- PIN_FLD_STATUS_FLAGS

PCM_OP_CUST_POL_TRANSITION_PLANS
Changed output fields
- PIN_FLD_LIMIT array was moved into the PIN_FLD_PLAN array.

PCM_OP_CUST_POL_VALID_AACINFO
Removed output fields
- PIN_FLD_FLD_FIELD array
**PCM_OP_CUST_POL_VALID_ACCTINFO**

**Removed input fields**
- PIN_FLD_BAL_INFO array

**New output fields**
- PIN_FLD_RESULT
- PIN_FLD_FIELD array

**Removed output fields**
- PIN_FLD_ACCTINFO

**PCM_OP_CUST_POL_VALID_BILLINFO**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_LIMIT**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.
- PIN_FLD_UNKNOWN in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_LOCALE**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_LOGIN**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.
- PIN_FLD_UNKNOWN in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_NAMEINFO**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_PAYINFO**

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_PROFILE**

**Changed input fields**
- PIN_FLD_INHERITED_INFO substruct is now mandatory.

**Changed output fields**
- PIN_FLD_DESCR in the PIN_FLD_FIELD array is now mandatory.

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.
**PCM_OP_CUST_POL_VALID_STATUS**

New input fields

- PIN_FLD_BILLINFO_OBJ
- PIN_FLD_END_T

Removed output fields

- PIN_FLD_TYPE in the PIN_FLD_FIELD array.
- PIN_FLD_UNKNOWN in the PIN_FLD_FIELD array.

**PCM_OP_CUST_POL_VALID_TAXINFO**

New input fields

- PIN_FLD_SESSION_OBJ
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_RESIDENCE_FLAG
- PIN_FLD_INCORPORATED_FLAG
- PIN_FLD_EXEMPTIONS array

---

**GPRS AAA Manager FM Policy Opcodes**

The following GPRS AAA Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GPRS_AAA_POL_AUTHORIZE**

Changed input fields

- PIN_FLD_SS_ACTION_CODE in the PIN_FLD_SERVICE_CODES array is now mandatory.
- PIN_FLD_SS_CODE in the PIN_FLD_SERVICE_CODES array is now mandatory.

**PCM_OP_GPRS_AAA_POL_AUTHORIZE_PREP_INPUT**

Changed input fields

- PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_EXTENDED_INFO substruct is now an integer type.
- PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_SESSION_INFO array is now an integer type.
- The following fields in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_SESSION_INFO array are now optional:
  - PIN_FLD_PDP_TYPE
  - PIN_FLD_PDP_ADDRESS
  - PIN_FLD_PDP_RADDRESS

Changed output fields

- PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_EXTENDED_INFO substruct is now an integer type.

**PCM_OP_GPRS_AAA_POL_REAUTHORIZE_PREP_INPUT**

Changed input fields
■ PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_EXTENDED_INFO substruct is now an integer type.

■ PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_SESSION array is now an integer type.

**Changed output fields**

■ PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_EXTENDED_INFO substruct is now an integer type.

**PCM_OP_GPRS_AAA_POL_STOP_ACCOUNTING_PREP_INPUT**

**Changed output fields**

■ PIN_FLD_EXTENDED_INFO substruct is now PIN_FLD_INHERITED_INFO substruct.

**PCM_OP_GPRS_AAA_POL_UPDATE_ACCOUNTING_PREP_INPUT**

**Changed input fields**

■ PIN_FLD_EXTENDED_INFO substruct is now PIN_FLD_INHERITED_INFO substruct.

■ PIN_FLD_SESSION_ID in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_INHERITED_INFO substruct is now an integer type.

■ PIN_FLD_PDP_TYPE in the PIN_FLD_GPRS_INFO substruct in the PIN_FLD_INHERITED_INFO substruct is now mandatory.

**GSM AAA Manager FM Policy Opcodes**

The following GSM AAA Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GSM_AAA_POL_SEARCH_SESSION**

**Removed input fields**

■ PIN_FLD_PROVIDER_ID

**GSM Manager FM Policy Opcodes**

The following GSM Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GSM_POL_APPLY_PARAMETER**

**New input fields**

■ PIN_FLD_GSM_INFO substruct in the PIN_FLD_INHERITED_INFO substruct in the PIN_FLD_SERVICES array.

**Changed output fields**

■ PIN_FLD_GSM_INFO substruct in the PIN_FLD_INHERITED_INFO substruct in the PIN_FLD_SERVICES array.

**Invoice Manager FM Policy Opcodes**

The following Invoice Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.
**PCM_OP_INV_POL_FORMAT_INVOICE**
Changed input fields
- PIN_FLD_LOCALE in the PIN_FLD_ACCTINFO array is now optional.

**PCM_OP_INV_POL_FORMAT_INVOICE_HTML**
Changed input fields
- The following fields in the PIN_FLD_ACCTINFO array are now optional:
  - PIN_FLD_CURRENCY_SECONDARY
  - PIN_FLD_BILL_TYPE
  - PIN_FLD_LOCALE
- PIN_FLD_LOGIN in the PIN_FLD_AR_ITEMS array is now mandatory.

**PCM_OP_INV_POL_FORMAT_VIEW_INVOICE**
Changed input fields
- PIN_FLD_HEADER_NUM and PIN_FLD_HEADER_STR are now optional.

**PCM_OP_INV_POL_PREP_INVOICE**
Changed input fields
- PIN_FLD_LOCALE in the PIN_FLD_ACCTINFO array is now optional.
Changed output fields
- PIN_FLD_LOCALE in the PIN_FLD_ACCTINFO array is now optional.

**PCM_OP_INV_POL_SELECT**
Changed input fields
- PIN_FLD_LOCALE in the PIN_FLD_ACCTINFO array is now optional.
Changed output fields
- PIN_FLD_LOCALE in the PIN_FLD_ACCTINFO array is now optional.

**Number Manager Policy Opcodes**
The following Number Manager policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_NUM_POL_CANONICALIZE**
Changed output fields
- PIN_FLD_NUMBERS array is now optional.

**PCM_OP_NUM_POL_DEVICE_ASSOCIATE**
New output fields
- PIN_FLD_SERVICES array:
  - PIN_FLD_END_T
  - PIN_FLD_DESCR
**PCM_OP_NUM_POL_DEVICE_CREATE**  
Changed input fields  
- PIN_FLD_DEVICE_ID is now mandatory.

Changed output fields  
- PIN_FLD_VANITY and PIN_FLD_NETWORK_ELEMENT fields in the PIN_FLD_DEVICE_NUM substruct are now optional.

**Payment FM Policy Opcodes**  
The following Payment FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PYMT_POL_VALID_VOUCHER**  
New output fields  
- PIN_FLD_Expiration_T

**Pricing FM Policy Opcodes**  
The following payment FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PRICE_POL_PREP_DEAL**  
Removed input fields  
- PIN_FLD_FLAGS in the PIN_FLD PRODUCTS array.

Removed output fields  
- PIN_FLD_FLAGS in the PIN_FLD PRODUCTS array.

**PCM_OP_PRICE_POL_PREP_PRODUCT**  
Removed input fields  
- PIN_FLD_TAX_SUPPLIER

Removed output fields  
- PIN_FLD_TAX_SUPPLIER

**PCM_OP_PRICE_POL_VALID_PRODUCT**  
Removed input fields  
- PIN_FLD_TAX_SUPPLIER

**Process Audit FM Policy Opcodes**  
The following Process Audit FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PROCESS_AUDIT_POL_ALERT**  
New input fields  
- PIN_FLD_THRESHOLDS array

New output fields
**Changed Policy Opcodes**

**Opcode Changes from Portal 7.3 to BRM 7.3.1**

- **PIN_FLD_POID**
- **PIN_FLD_MESSAGES array**
- **PIN_FLD_RESULT**

**PCM_OP_PROCESS_AUDIT_POL_CREATE**

**New input fields**

- **PIN_FLD_ACCOUNT_OBJ**
- **PIN_FLD_PROCESS_NAME**
- **PIN_FLD_TOTAL_RECORDS**
- **PIN_FLD_SUCCESSFUL_RECORDS**
- **PIN_FLD_FAILED_RECORDS**
- **PIN_FLD_BILLING_INFO substruct in the PIN_FLD_INHERITED_INFO substruct.**

**Removed input fields**

- **PIN_FLD_PIPE_LINE_INFO substruct and PIN_FLD_FAILED_CDRS array in the PIN_FLD_INHERITED_INFO substruct.**

**New output fields**

- **PIN_FLD_ACCOUNT_OBJ**
- **PIN_FLD_PROCESS_NAME**
- **PIN_FLD_TOTAL_RECORDS**
- **PIN_FLD_SUCCESSFUL_RECORDS**
- **PIN_FLD_FAILED_RECORDS**

**Changed output fields**

- **PIN_FLD_BILLING_SEGMENTS array was moved into the PIN_FLD_INHERITED substruct.**

**Removed output fields**

- **PIN_FLD_PIPE_LINE_INFO substruct**
- **PIN_FLD_FAILED_CDRS array**

**PCM_OP_PROCESS_AUDIT_POL_CREATE_AND_LINK**

**Changed input fields**

- The following fields were moved into the PIN_FLD_GROUP_DETAILS array:
  - **PIN_FLD_USAGE_START_T**
  - **PIN_FLD_USAGE_END_T**
  - **PIN_FLD_EVENT_COUNT**

**New output fields**

- **PIN_FLD_ACCOUNT_OBJ**
- **PIN_FLD_PROCESS_NAME**
- **PIN_FLD_BATCH_STAT substruct**
- **PIN_FLD_GROUP_DETAILS array**
Changed Policy Opcodes

- PIN_FLD_TOTAL_RECORDS
- PIN_FLD_SUCCESSFUL_RECORDS
- PIN_FLD_FAILED_RECORDS
- PIN_FLD_PROCESS_START_T
- PIN_FLD_PROCESS_END_T
- PIN_FLD_HOSTNAME
- PIN_FLD_ACTION

**PCM_OP_PROCESS_AUDIT_POL_CREATE_WRITEOFF_SUMMARY**

New input fields
- PIN_FLD_POID
- PIN_FLD_RESULTS array

New output fields
- PIN_FLD_POID
- PIN_FLD_GROUPDETAILS array

**Rating FM Policy Opcodes**

The following Rating FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_RATE_POL_MAP_TAX_SUPPLIER**

Changed input fields
- PIN_FLD_PRODUCTS array is now optional.

Changed output fields
- PIN_FLD_POID is now optional.

**PCM_OP_RATE_POL_POST_TAX**

New input fields
- PIN_FLD_RESULT
- PIN_FLD_NAMEINFO array

Changed input fields
- PIN_FLD_DESCR and PIN_FLD_LOCATION_MODE fields in the PIN_FLD_TAXES array are now mandatory.

New output fields
- PIN_FLD_MESSAGES array

**PCM_OP_RATE_POL_PRE_TAX**

Changed input fields
- The following fields in the PIN_FLD_TAXES array are now optional:
  - PIN_FLD_ORDER_ACCEPT
  - PIN_FLD_ORDER_ORIGIN
- PIN_FLD_SHIP_TO
- PIN_FLD_SHIP_FROM

**Removed input fields**
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_START_T
- PIN_FLD_END_T
- PIN_FLD_CURRENCY
- PIN_FLD_CURRENCY_NAME
- PIN_FLD_EXEMPTIONS array
- PIN_FLD_TAX_SUPPLIER
- PIN_FLD_NAME
- PIN_FLD_LOCATION
- PIN_FLD_VAT_CERT
- PIN_FLD_VATINFO array
- PIN_FLD_RESIDENCE_FLAG
- PIN_FLD_INCORPORATED_FLAG
- PIN_FLD_REGULATED_FLAG
- PIN_FLD_BILL_OBJ
- PIN_FLD_TAXES array:
  - PIN_FLD_TAX_CODE
  - PIN_FLD_AMOUNT_TAXED
  - PIN_FLD_COMMAND
  - PIN_FLD_INTER NATIONAL_IND
  - PIN_FLD_SERVICE_TYPE
  - PIN_FLD_TAXCODE_MAP
  - PIN_FLD_COUNT
  - PIN_FLD_ELAPSED_TIME

**Changed output fields**
- The following fields in the PIN_FLD_TAXES array are now optional:
  - PIN_FLD_ORDER_ACCEPT
  - PIN_FLD_ORDER_ORIGIN
  - PIN_FLD_SHIP_TO
  - PIN_FLD_SHIP_FROM

**Removed output fields**
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_START_T
- PIN_FLD_END_T
Changed Policy Opcodes

- PIN_FLD_CURRENCY
- PIN_FLD_CURRENCY_NAME
- PIN_FLD_EXEMPTIONS array
- PIN_FLD_TAX_SUPPLIER
- PIN_FLD_NAME
- PIN_FLD_LOCATION
- PIN_FLD_VAT_CERT
- PIN_FLD_VATINFO array
- PIN_FLD_RESIDENCE_FLAG
- PIN_FLD_INCORPORATED_FLAG
- PIN_FLD_REGULATED_FLAG
- PIN_FLD_BILL_OBJ
- PIN_FLD_BUFFER
- PIN_FLD_TAXES array:
  - PIN_FLD_TA X_CODE
  - PIN_FLD_AMOUNT_TAXED
  - PIN_FLD_COMMAND
  - PIN_FLD_INTERNATIONAL_IND
  - PIN_FLD_SERVICE_TYPE
  - PIN_FLD_TAXCODE_MAP
  - PIN_FLD_COUNT
  - PIN_FLD_ELAPSED_TIME

PCM_OP_RATE_POL_TAX_LOC

Changed input fields

- PIN_FLD_ACCOUNT_OBJ is now optional.

Removed output fields

- PIN_FLD_INTERNATIONAL_IND
- PIN_FLD_SERVICE_TYPE
- PIN_FLD_LOCATION_MODE

Remittance FM Policy Opcodes

The following Remittance FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_REMIT_POL_SPEC_QTY

Changed input fields

- PIN_FLD_RUM_NAME is now optional.
**PCM_OP_REPL_POL_PUSH**

Changed input fields
- PIN_FLD_SUPPLIER_OBJ is now mandatory.

**Resource Reservation FM Policy Opcodes**

The following Resource Reservation FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_RESERVE_POL_PREP_CREATE**

New input fields
- PIN_FLD_RESERVATION_OBJ
- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_RESERVATION_NO

Changed input fields
- PIN_FLD_EXPIRATION_T is now optional.

Removed input fields
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_SESSION_OBJ
- PIN_FLD_QUANTITY
- PIN_FLD_BALANCES array
- PIN_FLD_AVAILABLE_RESOURCE array
- PIN_FLD_RESERVATION_NO

Removed output fields
- PIN_FLD_QUANTITY
- PIN_FLD_BALANCES array

**PCM_OP_RESERVE_POL_PREP_EXTEND**

New input fields
- PIN_FLD_RESERVATION_NO
- PIN_FLD_RESERVATION_MODE
- PIN_FLD_END_T

Removed input fields
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_QUANTITY
- PIN_FLD_BALANCES array
- PIN_FLD_AVAILABLE_RESOURCE array

New output fields
- PIN_FLD_RESERVATION_NO
SIM Card Manager FM Policy Opcodes

The following SIM Card Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_SIM_POL_DEVICE_ASSOCIATE**

*Changed output fields*

- PIN_FLD_ACCOUNT_OBJ in the PIN_FLD_SERVICES array is now mandatory.

**PCM_OP_SIM_POL_DEVICE_CREATE**

*Changed input fields*

- The following fields in the PIN_FLD_DEVICE_SIM substruct has changed:
  - PIN_FLD_NETWORK_ELEMENT is now optional.
  - PIN_FLD_IMSI is now mandatory.

*Changed output fields*

- The following fields in the PIN_FLD_DEVICE_SIM substruct has changed:
  - PIN_FLD_NETWORK_ELEMENT is now optional.
  - PIN_FLD_IMSI is now mandatory.

**PCM_OP_SIM_POL_DEVICE_SET_ATTR**

*New input fields*

- PIN_FLD_DEVICE_ID

*New output fields*

- PIN_FLD_DEVICE_ID

Subscription FM Policy Opcodes

The following Subscription FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_SUBSCRIPTION_POL_COUNT_LINES**

*Removed input fields*

- PIN_FLD_PSEUDO_FLD_EVENT_NOTIFICATION_BILLING_START substruct
- PIN_FLD_PSEUDO_FLD_EVENT_NOTIFICATION_BILLING_START_PARTIAL substruct
- PIN_FLD_PSEUDO_FLD_EVENT_GROUP_SHARING_DISCOUNT_CREATE substruct

*New output fields*

- PIN_FLD_NAME
- PIN_FLD_USERID
- PIN_FLD_SESSION_OBJ
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_START_T
- PIN_FLD_END_T

**Removed output fields**
- PIN_FLD_RESULTS array

**PCM_OP_SUBSCRIPTION_POL_GENERATE_RERATE_REQUEST**

**New input fields**
- PIN_FLD_RERATE_ACCOUNTS array

**New output fields**
- PIN_FLD_RERATE_ACCOUNTS array

**PCM_OP_SUBSCRIPTION_POL_NOTIFY_AGGREGATION**

**New output fields**
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_SESSION_OBJ
- PIN_FLD_SUB_BAL_IMPACTS array
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_DESCR
- PIN_FLD_END_T
- PIN_FLD_EFFECTIVE_T

**Removed output fields**
- PIN_FLD_RESULTS array

**PCM_OP_SUBSCRIPTION_POL_PRE_FOLD**

**Changed input fields**
- PIN_FLD_END_T is now optional.

**Removed input fields**
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_STATUS
- PIN_FLD_STATUS_FLAGS
- PIN_FLD_CURRENCY
- PIN_FLD_CURRENCY_SECONDARY
- PIN_FLD_BILL_WHEN
- PIN_FLD_BILL_TYPE
- PIN_FLD_LAST_BILL_OBJ
- PIN_FLD_START_T
- PIN_FLD_ACTG_LAST_T
- PIN_FLD_ACTG_NEXT_T
- PIN_FLD_BILL_ACTGCYCLES_LEFT
- PIN_FLD_CLOSE_WHEN_T
- PIN_FLD_ITEM_OBJ
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_STATUS
  - PIN_FLD_FLAGS
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_QUANTITY
  - PIN_FLD_SERVICE_OBJ

**New output fields**
- PIN_FLD_POID

**PCM_OP_SUBSCRIPTION_POL_PREP_FOLD**

**New input fields**
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_PRODUCT_OBJ
  - PIN_FLD_OFFERING_OBJ

**Removed input fields**
- PIN_FLD_START_T

**Removed output fields**
- PIN_FLD_RESULTS array

**PCM_OP_SUBSCRIPTION_POL_SNOWBALL_DISCOUNT**

**Removed input fields**
- PIN_FLD_RATED_TIMEZONE_ID
- PIN_FLD_TIMEZONE_MODE
- PIN_FLD_TIMEZONE_ADJ_START_T
- PIN_FLD_TIMEZONE_ADJ_END_T

**Removed output fields**
- PIN_FLD_RATED_TIMEZONE_ID
- PIN_FLD_TIMEZONE_MODE
- PIN_FLD_TIMEZONE_ADJ_START_T
- PIN_FLD_TIMEZONE_ADJ_END_T
**PCM_OP_SUBSCRIPTION_POL_SPEC_CANCEL**

**Removed input fields**
- PIN_FLD_OFFERING_OBJ in the PIN_FLD_PRODUCTS array.

**Removed output fields**
- PIN_FLD_OFFERING_OBJ in the PIN_FLD_PRODUCTS array.

**PCM_OP_SUBSCRIPTION_POL_SPEC_CYCLE_FEE_INTERVAL**

**New input fields**
- PIN_FLD_SCALE

**Changed input fields**
- PIN_FLD_UNITS is now PIN_FLD_UNIT

**New output fields**
- PIN_FLD_SCALE

**PCM_OP_SUBSCRIPTION_POL_SPEC_FOLD**

**Removed input fields**
- PIN_FLD_CREATED_T
- PIN_FLD_MOD_T

**PCM_OP_SUBSCRIPTION_POL_SPEC_RERATE**

**Changed input fields**
- The following fields in the PIN_FLD_ARGS array are now optional:
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_POID
  - PIN_FLD_SERVICE_OBJ

**PCM_OP_SUBSCRIPTION_POL_UPDATE_CDC**

**New input fields**
- PIN_FLD_EVENT_TYPE
- PIN_FLD_PSEUDO_FLD_PCM_OP_CUST_SET_STATUS substruct

**Removed input fields**
- PIN_FLD_FLAGS

**New output fields**
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_EVENT_TYPE
- PIN_FLD_PSEUDO_FLD_PCM_OP_CUST_SET_STATUS substruct

**Removed output fields**
- PIN_FLD_RESULTS array
Services Framework AAA Manager FM Policy Opcodes

The following Services Framework AAA Manager FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_TCF_AAA_POL_MATCH_CONTINUATION_CALL**

Changed input fields
- PIN_FLD_EXTENDED_INFO substruct is now optional.
- PIN_FLD_TELCO_INFO substruct in the PIN_FLD_EXTENDED_INFO substruct is now optional.
- PIN_FLD_CALLED_TO in the PIN_FLD_TELCO substruct is now optional.

Voucher FM Policy Opcodes

The following Voucher FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_VOUCHER_POL_DEVICE_ASSOCIATE**

New input fields
- PIN_FLD_SERVICE_OBJ in the PIN_FLD_SERVICES array.

Changed input fields
- PIN_FLD_ACCOUNT_OBJ in the PIN_FLD_SERVICES array is now optional.

Removed input fields
- PIN_FLD_DEAL_OBJ in the PIN_FLD_DEVICE_VOUCHER substruct in the PIN_FLD_EXTENDED_INFO substruct.

New output fields
- PIN_FLD_SERVICE_OBJ in the PIN_FLD_SERVICES array.
- PIN_FLD_EXTENDED_INFO substruct:
  - PIN_FLD_DEVICE_VOUCHER array:
    - PIN_FLD_DEVICE_ID
    - PIN_FLD_EXPIRATION_T
  - PIN_FLD_BAL_IMPACTS array

Changed output fields
- PIN_FLD_DEVICE_VOUCHER substruct in the PIN_FLD_EXTENDED_INFO substruct is now mandatory.
- PIN_FLD_VOUCHER_PIN in the PIN_FLD_DEVICE_VOUCHER substruct in the PIN_FLD_EXTENDED_INFO substruct is now mandatory.

Removed output fields
- PIN_FLD_DEAL_OBJ in the PIN_FLD_DEVICE_VOUCHER substruct in the PIN_FLD_EXTENDED_INFO substruct.

Zone Map FM Policy Opcodes

The following Zone Map FM policy opcodes were changed between Portal 7.3 and BRM 7.3.1.
**PCM_OP_ZONEMAP_POL_GET_LINEAGE**

New input fields
- PIN_FLD_ZONEMAP_NAME
- PIN_FLD_ZONEMAP_TARGET
- PIN_FLD_ZONEMAP_SEARCH_TYPE

New output fields
- PIN_FLD_ZONEMAP_LINEAGE

**PCM_OP_ZONEMAP_POL_SET_ZONEMAP**

Changed input fields
- PIN_FLD_POID is now optional.

### Changed Standard Opcodes

The following standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

#### Activity FM Standard Opcodes

The following Activity FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_ACT_ACTIVITY**

New output fields
- PIN_FLD_ACTIVE_SESSION_ID
- PIN_FLD_SUB_BAL_IMPACTS array
- PIN_FLD_UNRATED_QUANTITY
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_RATING_STATUS
- PIN_FLD_BALANCES array

**PCM_OP_ACT_AUTHORIZE**

New input fields
- PIN_FLD_END_T
- PIN_FLD_SESSION_OBJ
- PIN_FLD_SCALED_DELAY_TIME

Changed input fields
- PIN_FLD_MIN_QUANTITY and PIN_FLD_RUM_MAP array were moved into the PIN_FLD_RATING_INFO substruct.

New output fields
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_EXPIRATION_T

Changed output fields
- PIN_FLD_RATING_STATUS is now mandatory.

**Removed output fields**
- PIN_FLD_TIMEZONE_ID

**PCM_OP_ACT_CALC_MAX_USAGE**

**Removed input fields**
- PIN_FLD_END_T in the PIN_FLD_EVENT substruct.

**New output fields**
- PIN_FLD_RESULTS array:
  - PIN_FLD_UNRATED_QUANTITY
  - PIN_FLD_NET_QUANTITY

**PCM_OP_ACT_FIND**

**New input fields**
- PIN_FLD_USERID

**New output fields**
- PIN_FLD_STATUS

**PCM_OP_ACT_FIND_VERIFY**

**Changed output fields**
- PIN_FLD_REASON is now mandatory.

**PCM_OP_ACT_MULTI_AUTHORIZE**

**Changed input fields**
- PIN_FLD_LOGIN is now mandatory.
- The following fields were moved into the PIN_FLD_SERVICES array:
  - PIN_FLD_USAGE_TYPE
  - PIN_FLD_EVENT substruct
  - PIN_FLD_BALANCES array
  - PIN_FLD_EXTENDED_INFO substruct

**Changed output fields**
- PIN_FLD_NET_QUANTITY and PIN_FLD_UNRATED_QUANTITY in the PIN_FLD_RUM_MAP array are now mandatory.

**PCM_OP_ACT_REAUTHORIZE**

**New input fields**
- PIN_FLD_SESSION_OBJ
- PIN_FLD_SCALED_DELAY_TIME

**Changed input fields**
- PIN_FLD_SERVICE_OBJ is now optional.
- PIN_FLD_MIN_QUANTITY was moved into the PIN_FLD_RATING_INFO substruct.
Removed input fields
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_RESERVATION_OBJ
- PIN_FLD_RESERVATION_LIST array

Changed output fields
- PIN_FLD_ACTIVE_SESSION_ID is now mandatory.

Removed output fields
- PIN_FLD_TIMEZONE_ID

New output fields
- PIN_FLD_EXPIRATION_T

**PCM_OP_ACT_USAGE (input fields)**

New input fields
- PIN_FLD_READ_BALGRP_MODE
- PIN_FLD_DELETED_FLAG
- PIN_FLD_EVENT substruct:
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_TOTAL array
  - PIN_FLD_MONITOR_IMPACTS array
- PIN_FLD_PRODUCTS array:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_CYCLE_ENDDETAILS
  - PIN_FLD_CYCLE_STARTDETAILS
  - PIN_FLD_PURCHASE_ENDDETAILS
  - PIN_FLD_PURCHASE_STARTDETAILS
  - PIN_FLD_USAGE_ENDDETAILS
  - PIN_FLD_USAGE_STARTDETAILS
- PIN_FLD_DISCOUNT_LIST array in the PIN_FLD_DISCOUNTS array:
  - PIN_FLD_PURCHASE_STARTDETAILS
  - PIN_FLD_PURCHASE_ENDDETAILS
  - PIN_FLD_USAGE_STARTDETAILS
  - PIN_FLD_USAGE_ENDDETAILS
  - PIN_FLD_FIRST_USAGE
- PIN_FLD_EXEMPTIONS array:
  - PIN_FLD_CERTIFICATE_NUM
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T

Changed input fields
- PIN_FLD_START_T and PIN_FLD_END_T in the PIN_FLD_EVENT substruct are now optional.
- PIN_FLD_PLAN_OBJ, PIN_FLD_PRODUCT_OBJ and PIN_FLD_STATUS in the PIN_FLD_PRODUCTS array are now mandatory.
- PIN_FLD_VALID_TO and PIN_FLD_VALID_FROM in the PIN_FLD_PROFILE_DATA array are now mandatory.

**Removed input fields**
- PIN_FLD_ON_DEMAN_INFO substruct:
  - PIN_FLD_BILL_OBJ
  - PIN_FLD_AR_BILL_OBJ
  - PIN_FLD_ITEM_POID_LIST
  - PIN_FLD_SPONSOR array
  - PIN_FLD_SERVICES array
- PIN_FLD_DISCOUNT_LIST array in PIN_FLD_DISCOUNTS array in PIN_FLD_PERIOD array:
  - PIN_FLD_OFFERING_OBJ
  - PIN_FLD_DISCOUNT_OBJ
  - PIN_FLD_SCALE
  - PIN_FLD_STATUS
  - PIN_FLD_TYPE
  - PIN_FLD_QUANTITY
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T
  - PIN_FLD_FLAGS
- PIN_FLD_BAL_IMPACTS array
- PIN_FLD_TOTAL array
- PIN_FLD_INHERITED_INFO substruct
- PIN_FLD_MONITOR_IMPACTS array

**PCM_OP_ACT_USAGE (output fields)**

**New output fields**
- PIN_FLD_BAL_IMPACTS array:
  - PIN_FLD_IMPACT_TYPE
  - PIN_FLD_RESOURCE_ID
  - PIN_FLD_RESOURCE_ID_ORIG
Changed Standard Opcodes

Opcode Changes from Portal 7.3 to BRM 7.3.1

- PIN_FLD_TAX_CODE
- PIN_FLD_RATE_TAG
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_ITEM_OBJ
- PIN_FLD_RATE_OBJ
- PIN_FLD_DISCOUNT
- PIN_FLD_PERCENT
- PIN_FLD_QUANTITY
- PIN_FLD_AMOUNT_DEFERRED
- PIN_FLD_AMOUNT
- PIN_FLD_AMOUNT_ORIG
- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_GL_ID

- PIN_FLD_SUB_BAL_IMPACTS array in the PIN_FLD_RESULTS array:
  - PIN_FLD_BAL_GRP_OBJ
  - PIN_FLD_RESOURCE_ID
  - PIN_FLD_SUB_BALANCES array

Changed output fields

- PIN_FLD_SUB_BAL_IMPACTS was moved from PIN_FLD_BAL_IMPACTS array into the PIN_FLD_RESULTS array.

- The following fields in the PIN_FLD_RUM_MAP array in the PIN_FLD_RESULTS array are now mandatory:
  - PIN_FLD_NET_QUANTITY
  - PIN_FLD_RUM_NAME
  - PIN_FLD_UNRATED_QUANTITY

- PIN_FLD_EXTENDED_INFO substruct is now optional.

Removed output fields

- PIN_FLD_ON_DEMAND_INFO substruct:
  - PIN_FLD_BILL_OBJ
  - PIN_FLD_AR_BILL_OBJ
  - PIN_FLD_ITEM_POID_LIST
  - PIN_FLD_SPONSOR array
  - PIN_FLD_SERVICES array

**Accounts Receivable (A/R) Standard Opcodes**

The following Accounts Receivable standard opcodes were changed between Portal 7.3 and BRM 7.3.1.
**PCM_OP_AR_ACCOUNT_ADJUSTMENT**

**New output fields**
- PIN_FLD_ON_DEMAND_INFO substruct
- PIN_FLD_RESULTS array:
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_SUB_BAL_IMPACTS array
  - PIN_FLD_TOTAL array
  - PIN_FLD_RUM_MAP array
  - PIN_FLD_UNRATED_QUANTITY
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_RATING_STATUS
  - PIN_FLD_CYCLE_INFO substruct
- PIN_FLD_EXTENDED_INFO substruct
- PIN_FLD_ROLLOVER_INFO substruct

**Changed output fields**
- PIN_FLD_RESULTS array is now mandatory.

**PCM_OP_AR_ACCOUNT_WRITEOFF**

**Changed output fields**
- PIN_FLD_BILLINFO in the PIN_FLD_RESULTS array is now PIN_FLD_BILLINFO_OBJ

**PCM_OP_AR_BILL_ADJUSTMENT**

**New input fields**
- PIN_FLD_END_T

**Changed input fields**
- PIN_FLD_DESCR is now mandatory.

**PCM_OP_AR_BILL_DISPUTE**

**New input fields**
- PIN_FLD_END_T

**Changed input fields**
- PIN_FLD_AMOUNT is now mandatory.
- PIN_FLD_DESCR is now mandatory.

**PCM_OP_AR_BILL_SETTLEMENT**

**New input fields**
- PIN_FLD_END_T

**Changed input fields**
- PIN_FLD_DESCR is now mandatory.
Changed output fields

- PIN_FLD_DESCR is now mandatory.

**PCM_OP_AR_BILLINFO_WRITEOFF**

Changed input fields

- PIN_FLD_DESCR is now mandatory.

**PCM_OP_AR_EVENT_ADJUSTMENT**

New input fields

- PIN_FLD_STR_VERSION
- PIN_FLD_STRING_ID

New output fields

- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_EVENTS array:
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_SUB_BAL_IMPACTS array
  - PIN_FLD_TOTAL array
  - PIN_FLD_RUM_MAP array
  - PIN_FLD_UNRATED_QUANTITY
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_RATING_STATUS
  - PIN_FLD_CYCLE_INFO substruct

Changed output fields

- PIN_FLD_EVENTS array is now optional.
- PIN_FLD_POID in the PIN_FLD_ITEMS array is now PIN_FLD_ITEM_OBJ

**PCM_OP_AR_GET_ACCT_ACTION_ITEMS**

New output fields

- PIN_FLD_CREATED_T
- PIN_FLD_DISPUTE_TYPE
- PIN_FLD_ADJUSTMENT_TYPE
- PIN_FLD_SETTLEMENT_TYPE
- PIN_FLD_RESOURCE_IMPACTED
- PIN_FLD_RESOURCE_ID
- PIN_FLD_EVENTS array
- PIN_FLD_AGGREGATE_AMOUNTS array

Changed output fields

- PIN_FLD_ITEM_NAME is now PIN_FLD_NAME
Removed output fields
- PIN_FLD_DUE_T

**PCM_OP_AR_GET_ACCT_BAL_SUMMARY**
New output fields
- PIN_FLD_DISPUTE_TYPE
- PIN_FLD_ITEM_PENDING_FLAGS
- PCM_OP_AR_GET_ACCT_BILLS

Changed input fields
- PIN_FLD_STATUS is now optional.

**PCM_OP_AR_GET_ACTION_ITEMS**
Changed input fields
- PIN_FLD_AR_BILLINFO_OBJ is now optional.
- PCM_OP_AR_GET_ACTION_ITEMS
New output fields
- PIN_FLD_CREATED_T

Changed output fields
- PIN_FLD_ITEM_NAME is now PIN_FLD_NAME.
- PIN_FLD.RELATED_BILL_ITEM_OBJ and PIN_FLD.RELATED_ACTION_ITEM_OBJ are now optional.
- The following fields in the PIN_FLD_AGGREGATE_AMOUNTS array are now optional:
  - PIN_FLD_RESOURCE_ID
  - PIN_FLD_AMOUNT
  - PIN_FLD_DISCOUNT

Removed output fields
- PIN_FLD_DUE_T

**PCM_OP_AR_GET_BAL_SUMMARY**
New output fields
- PIN_FLD_DISPUTE_TYPE

Changed output fields
- PIN_FLD_ITEM_PENDING_FLAGS is now optional.

**PCM_OP_AR_GET_BILL_ITEMS**
Removed input fields
- PIN_FLD_AR_ACCOUNT_OBJ
- PIN_FLD_ACCOUNT_OBJ

New output fields
- PIN_FLD_RESULTS array:
- PIN_FLD_ADJUSTED
- PIN_FLD_DISPUTED
- PIN_FLD_RECV
- PIN_FLD_WRITEOFF

Changed output fields
- PIN_FLD_ITEM_NAME is now PIN_FLD_NAME.
- PIN_FLD_ALLOCATED field in the PIN_FLD_RESULTS array is now optional.

Removed output fields
- PIN_FLD_DUE_T

PCM_OP_AR_GET_BILLS
Changed input fields
- PIN_FLD_STATUS is now optional.

New output fields
- PIN_FLD_START_T

PCM_OP_AR_GET_DISPUTES
New output fields
- PIN_FLD_SERVICE_OBJ

PCM_OP_AR_GET_ITEM_DETAIL
Changed output fields
- PIN_FLD_SYS_DESCR in the PIN_FLD_TRANSFERS_OUT array is now mandatory.

Removed output fields
- PIN_FLD_UNKNOWN

PCM_OP_AR_GET_ITEMS
Removed output fields
- PIN_FLD_UNKNOWN

PCM_OP_AR_ITEM_ADJUSTMENT
New output fields
- PIN_FLD_BAL_IMPACTS array
- PIN_FLD_SUB_BAL_IMPACTS array
- PIN_FLD_TOTAL array
- PIN_FLD_RUM_MAP array
- PIN_FLD_UNRATED_QUANTITY
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_RATING_STATUS
■ PIN_FLD_CYCLE_INFO substruct

Changed output fields
■ PIN_FLD_DESCR is now mandatory.

**PCM_OP_AR_REVERSE_WRITEOFF**
New input fields
■ PIN_FLD_REASON_DOMAIN_ID
■ PIN_FLD_REASON_ID

Removed input fields
■ PIN_FLD_SESSION_OBJ
■ PIN_FLD_DESCR

**Balance FM Standard Opcodes**
The following Balance FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_BAL_CHANGE_VALIDITY**
Changed input fields
■ PIN_FLD_BAL_GRP_OBJ is now optional.

**PCM_OP_BAL_GET_ACCT_BILLINFO**
Changed output fields
■ PIN_FLD_NAMEINFO array is now mandatory.

**PCM_OP_BAL_GET_BAL_GRP_AND_SVC**
New input fields
■ PIN_FLD_END_T

New output fields
■ PIN_FLD_ACCOUNT_OBJ
■ PIN_FLD_SUBSCRIPTION_OBJ
■ PIN_FLD_STATUS
■ PIN_FLD_LAST_STATUS_T

Changed output fields
■ PIN_FLD_SERVICE_OBJ is now mandatory.

**PCM_OP_BAL_GET_BALANCES**
New input fields
■ PIN_FLD_BAL_INFO array

Changed input fields
■ PIN_FLD_RESERVED_AMT in the PIN_FLD_BALANCES array is now PIN_FLD_RESERVED_AMOUNT.

New output fields
Changed Standard Opcodes

11-35

- PIN_FLD_REALTIME_CNTR
- PIN_FLD_SUB_BALANCES array:
  - PIN_FLD_VALID_FROM_DETAILS
  - PIN_FLD_VALID_TO_DETAILS

Changed output fields
- PIN_FLD_RESERVED_AMT in the PIN_FLD_BALANCES array is now PIN_FLD_RESERVED_AMOUNT.
- PIN_FLD_CONSUMPTION_RULE in the PIN_FLD_BALANCES array is now optional.

PCM_OP_BAL_GET_PREPAID_BALANCES
New input fields
- PIN_FLD_RESERVATION_OBJ

New output fields
- PIN_FLD_SUB_BALANCES array:
  - PIN_FLD_VALID_FROM_DETAILS
  - PIN_FLD_VALID_TO_DETAILS

Balance Monitoring FM Standard Opcodes
The following Balance Monitoring FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_MONITOR_HIERARCHY_CLEANUP
Changed input fields
- PIN_FLD_FLAGS and PIN_FLD_MEMBERS array in the PIN_FLD_PSUEDO_FLD_EVENT_GROUP_MEMBER substruct are now optional.
- PIN_FLD_PAY_TYPE in PIN_FLD_BILLINFO array is now optional

PCM_OP_MONITOR_PROCESS_BILLING_MONITORS
Changed input fields
- PIN_FLD_PARENT is now optional.

Base Opcodes
The following base opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_SEARCH
Changed input fields
- PIN_FLD_TEMPLATE now takes the POID subcomponent as in “F1.subcomponent = V1 “ where subcomponent can be id, type, db, or rev, in addition to the existing format “F1 = V1 “ in the where clause of the expression.

Billing FM Standard Opcodes
The following Billing FM opcodes were changed between Portal 7.3 and BRM 7.3.1.
**PCM_OP_BILL_DEBIT**

**Removed input fields**
- PIN_FLD_TYPE in the PIN_FLD_DEBIT array.

**New output fields**
- PIN_FLD_RESULT
- PIN_FLD_DESCR
- PIN_FLD_ON_DEMAND_INFO substruct
- PIN_FLD_EXTENDED_INFO substruct
- PIN_FLD_ROLLOVER_INFO substruct
- PIN_FLD_RESULTS array:
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_SUBBAL_IMPACTS array
  - PIN_FLD_TOTAL array
  - PIN_FLD_RUM_MAP array
  - PIN_FLD_UNRATED_QUANTITY
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_RATING_STATUS
  - PIN_FLD_CYCLE_INFO substruct

**PCM_OP_BILL_FIND**

**New output fields**
- PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_NO
  - PIN_FLD_PARENT
  - PIN_FLD_ACCOUNT_OBJ

**PCM_OP_BILL_GET_ITEM_EVENT_CHARGE_DISCOUNT**

**New output fields**
- PIN_FLD_EVENTS array in the PIN_FLD_RESULTS array:
  - PIN_FLD_RUM_NAME
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_EVENT_OBJ
  - PIN_FLD_CREATED_T

**PCM_OP_BILL_GROUP_ADD_MEMBER**

**Removed output fields**
- PIN_FLD_RESULTS array
Changed Standard Opcodes

Opcode Changes from Portal 7.3 to BRM 7.3.1

**PCM_OP_BILL_GROUP_CREATE**
New output fields
- PIN_FLD_PARENT

**PCM_OP_BILL_GROUP_DELETE_MEMBER**
Removed input fields
- PIN_FLD_FLAGS

**PCM_OP_BILL_MAKE_BILL**
New input fields
- PIN_FLD_START_T
- PIN_FLD_FLAGS

Removed input fields
- PIN_FLD_SESSION_OBJ

New output fields
- PIN_FLD_CURRENT_TOTAL

Changed output fields
- PIN_FLD_REVENUES_ARRAY array is now PIN_FLD_REVENUES array.

**PCM_OP_BILL_MAKE_BILL_NOW**
Removed input fields
- PIN_FLD_SESSION_OBJ
- PIN_FLD_ON_DEMAND_INFO substruct

Changed output fields
- PIN_FLD_LAST_BILL_OBJ and PIN_FLD_PENDING_RECV in the PIN_FLD_RESULTS array are now mandatory.

**PCM_OP_BILL_MAKE_BILL_ON_DEMAND**
Removed input fields
- PIN_FLD_SESSION_OBJ
- PIN_FLD_ON_DEMAND_INFO substruct:
  - PIN_FLD_BILL_OBJ
  - PIN_FLD_AR_BILL_OBJ
  - PIN_FLD_ITEM_POID_LIST
  - PIN_FLD_SPONSOR array
  - PIN_FLD_SERVICES array

Removed output fields
- PIN_FLD_ON_DEMAND_INFO substruct:
  - PIN_FLD_BILL_OBJ
  - PIN_FLD_AR_BILL_OBJ
  - PIN_FLD_ITEM_POID_LIST
- PIN_FLD_SPONSOR array
- PIN_FLD_SERVICES array

**PCM_OP_BILL_MAKE_TRIAL_BILL**
New output fields
- PIN_FLDBILLINFO_OBJ

Changed output fields
- PIN_FLD_AMOUNT in the PIN_FLD_REVENUES array is now of type String.

**PCM_OP_BILL_RESUME_BILLING**
Changed output fields
- PIN_FLD_BILLINFO array is now mandatory.

### Channel FM Standard Opcodes
The following Channel FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_CHANNEL_SYNC**
Removed input fields
- PIN_FLD_INVOKE_T
- PIN_FLD_LAST_INVOKE_T

### Content Manager FM Standard Opcodes
The following Content Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_CONTENT_ACCOUNTING**
Changed input fields
- PIN_FLD_LOGIN is now mandatory.
- PIN_FLD_AMOUNT is now mandatory.

**PCM_OP_CONTENT_AUTHORIZE**
New input fields
- PIN_FLD_RESULT

New output fields
- PIN_FLD_LOGIN

Removed output fields
- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_CONTENT_AUTHENTICATE**
New input fields
- PIN_FLD_EXPIRATION_T

Changed input fields
PIN_FLD_QUANTITY is now mandatory.
PIN_FLD_AMOUNT is now mandatory.

New output fields
- PIN_FLD_MIN_QUANTITY

**PCM_OP_CONTENT_CANCEL_AUTHORIZATION**

Changed input fields
- PIN_FLD_AUTHORIZATION_ID is now mandatory.

**PCM_OP_CONTENT_FIND**

Changed input fields
- PIN_FLD_LOGIN is now mandatory.

**Customer FM Standard Opcodes**

The following Customer FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_CUST_COMMIT_CUSTOMER (input fields)**

New input fields
- PIN_FLD_DEAL_INFO substruct:
  - PIN_FLD_NAME
  - PIN_FLD_DESCR
  - PIN_FLD_START_T
  - PIN_FLD_END_T
  - PIN_FLD_FLAGS
- PIN_FLD_PRODUCTS array in PIN_FLD_ACCTINFO array:
  - PIN_FLD_CYCLE_DISC_AMT
  - PIN_FLD_CYCLE_FEE_AMT
  - PIN_FLD_PURCHASE_DISC_AMT
  - PIN_FLD_PURCHASE_FEE_AMT
- PIN_FLD_PERMITTEDS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_ACCTINFO array.
- PIN_FLD_NAME and PIN_FLD_BILLINFO_OBJ in the PIN_FLD_BAL_INFO array.
- PIN_FLD_POID and PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_PAYINFO array.
- PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
  - PIN_FLD_POID
  - PIN_FLD_NAME
  - PIN_FLD_DESCR
  - PIN_FLD_START_T
- PIN_FLD_END_T
- PIN_FLD_FLAGS

**PIN_FLD_PRODUCTS** array in the PIN_FLD DEAL_INFO substruct in the PIN_FLD SERVICES array:
- PIN_FLD_CYCLE_DISC_AMT
- PIN_FLD_CYCLE_FEE_AMT
- PIN_FLD_PURCHASE_DISC_AMT
- PIN_FLD_PURCHASE_FEE_AMT

**PIN_FLD_DEALS** array in the PIN_FLD SERVICES array.

**Changed input fields**

- **PIN_FLD DEAL_INFO** array in the PIN_FLD ACCTINFO array is now of type SUBSTRUCT.
- **PIN_FLD_PRODUCT_OBJ** in the PIN_FLD PRODUCTS array in the PIN_FLD ACCTINFO array is now mandatory.

  The following fields in the PIN_FLD PRODUCTS array in the PIN_FLD ACCTINFO array are now mandatory:
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_CYCLE_DISCOUNT
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T
  - PIN_FLD_USAGE_DISCOUNT

- The following fields in the PIN_FLD DISCOUNTS array in the PIN_FLD ACCTINFO array are now mandatory:
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T

- **PIN_FLD CREDIT LIMIT** in the PIN_FLD LIMIT array in the PIN_FLD BAL_INFO array is now mandatory.

- **PIN_FLD BILL_INFO_ID** in the PIN_FLD BILLINFO array is now PIN_FLD BILLINFO_ID

- **PIN_FLD PAYINFO** array is now mandatory.

- **PIN_FLD DEBIT_EXP** and **PIN_FLD DEBIT_NUM** in the PIN_FLD CC_INFO array in the PIN_FLD PAYINFO array are now mandatory.


- PIN_FLD_BANK_NO in the PIN_FLD_DD_INFO array in the PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- The following fields in the PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY
- PIN_FLD_PASSWD_CLEAR in the PIN_FLD_SERVICES array is now mandatory.
- PIN_FLD_DEAL_INFO array in the PIN_FLD_SERVICES array is now of type SUBSTRUCT.
- The following fields in the PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array are now mandatory:
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_CYCLE_DISCOUNT
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T
  - PIN_FLD_USAGE_DISCOUNT

**Removed input fields**

- PIN_FLD_PRODUCTS array in the PIN_FLD_ACCTINFO array:
  - PIN_FLD_NAME
  - PIN_FLD_own_MAX
  - PIN_FLD_own_MIN
- PIN_FLD_DISCOUNTS array in the PIN_FLD_ACCTINFO array:
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_DEAL_OBJ
  - PIN_FLD_PLAN_OBJ
  - PIN_FLD_USAGE_DISCOUNT
- PIN_FLD_PERMITTED in the PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_ACCTINFO array.
- PIN_FLD_PAY_TYPE in the PIN_FLD_BILLINFO array in the PIN_FLD_BAL_INFO array.
- PIN_FLD_ACH in the PIN_FLD_PAYINFO array in the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYMENT_OFFSET in the PIN_FLD_BILLINFO array.
- PIN_FLD_DEALS array in the PIN_FLD_SERVICES array.
PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
- PIN_FLD_STATUS_FLAGS
- PIN_FLD_NAME
- PIN_FLD_OWN_MAX
- PIN_FLD_OWN_MIN

PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
- PIN_FLD_STATUS_FLAGS
- PIN_FLD_DEAL_OBJ
- PIN_FLD_PLAN_OBJ
- PIN_FLD_USAGE_DISCOUNT

**PCM_OP_CUST_COMMIT_CUSTOMER (output fields)**
The output flist is changed to add purchased offering POIDs and package IDs. This supports sending data to an external customer relationship manager (CRM) system.

**New output fields**
- PIN_FLD_FLAGS
- PIN_FLD_ACCTINFO array
- PIN_FLD_END_T
- PIN_FLD_START_T
- PIN_FLD_NAME in the PIN_FLD_BAL_INFO array.
- PIN_FLD_BILLINFO array:
  - PIN_FLD_POID
  - PIN_FLD_BUSINESS_PROFILE_OBJ
  - PIN_FLD_BILLINFO_ID
  - PIN_FLD_PAYINFO_OBJ
  - PIN_FLD_PARENT_FLAGS
  - PIN_FLD_ACTG_FUTURE_DOM
  - PIN_FLD_BILLING_STATUS
  - PIN_FLD_BILLING_STATUS_FLAGS
  - PIN_FLD_STATUS
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_SPONSOR_FLAGS
  - PIN_FLD_SPONSOREE_FLAGS
  - PIN_FLD_AR_BILLINFO_OBJ
  - PIN_FLD_PARENT_BILLINFO_OBJ
  - PIN_FLD_BILLING_SEGMENT
  - PIN_FLD_EFFECTIVE_T
Changed Standard Opcodes

Opcode Changes from Portal 7.3 to BRM 7.3.1

- PIN_FLD_PAYINFO array:
  - PIN_FLD_POID
  - PIN_FLD_PAYMENT_TERM
  - PIN_FLD_PAYMENT_OFFSET
- PIN_FLD_ACTGINFO array
- PIN_FLD_SERVICES array:
  - PIN_FLD_SUBSCRIPTION_INDEX
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_BAL_INFO array
  - PIN_FLD_ALIAS_LIST array
  - PIN_FLD_PASSWD_STATUS
- PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
  - PIN_FLD_POID
  - PIN_FLD_PLAN_OBJ
  - PIN_FLD_NAME
  - PIN_FLD_DESCR
  - PIN_FLD_START_T
  - PIN_FLD_END_T
  - PIN_FLD_FLAGS
- PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FL
  D_SERVICES array:
  - PIN_FLD_OFFERING_OBJ
  - PIN_FLD_PACKAGE_ID
  - PIN_FLD_PURCHASE_DISC_AMT
  - PIN_FLD_PURCHASE_FEE_AMT
  - PIN_FLD_CYCLE_DISC_AMT
  - PIN_FLD_CYCLE_FEE_AMT
- PIN_FLD_PACKAGE_ID and PIN_FLD_OFFERING_OBJ in the PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array.
- PIN_FLD_PERMITTEDS array in the PIN_FLD_DISCOUNTS array in the PIN_FL
  D_DEAL_INFO substruct in the PIN_FLD_SERVICES array.
- PIN_FLD_DEALS array in the PIN_FLD_SERVICES array.
- PIN_FLD_DEVICES array in the PIN_FLD_SERVICES array.
- PIN_FLD_SPONSOR array
- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_TOPUP_INFO array
• PIN_FLD_HOST array
• PIN_FLD_HTTP_URL
• PIN_FLD_SUPPORT_PHONE

**Changed output fields**

• PIN_FLD_ACCOUNT_OBJ is now mandatory.
• The following fields were moved into the PIN_FLD_ACCTINFO array:
  - PIN_FLD_AAC_ACCESS
  - PIN_FLD_AAC_SOURCE
  - PIN_FLD_AAC_VENDOR
  - PIN_FLD_AAC_PACKAGE
  - PIN_FLD_AAC_PROMO_CODE
  - PIN_FLD_AAC_SERIAL_NUM
• PIN_FLD_CREDIT_LIMIT in the PIN_FLD_LIMIT in PIN_FLD_BAL_INFO array is now mandatory.
• PIN_FLD_PAY_TYPE in the PIN_FLD_BILLINFO array is now mandatory.
• PIN_FLD_BAL_GRP_OBJ in the PIN_FLD_BILLINFO array is now optional.
• PIN_FLD_BILLINFO_OBJ, PIN_FLD_ACCOUNT_OBJ, and PIN_FLD_SERVICE_OBJ in the PIN_FLD_BAL_INFO array are now optional.
• PIN_FLD_NAMEINFO array is now mandatory.
• The following fields in the PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY
  - PIN_FLD_PHONE
• PIN_FLD_LOCALE in the PIN_FLD_LOCALES array is now mandatory.
• PIN_FLD_DEAL_INFO array in the PIN_FLD_SERVICES array is now of type SUBSTRUCT.
• The following fields in the PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array are now mandatory:
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_CYCLE_DISCOUNT
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T
  - PIN_FLD_USAGE_DISCOUNT
The following fields in the PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array are now mandatory:

- PIN_FLD_PURCHASE_START_T
- PIN_FLD_PURCHASE_END_T
- PIN_FLD_CYCLE_START_T
- PIN_FLD_CYCLE_END_T
- PIN_FLD_USAGE_START_T
- PIN_FLD_USAGE_END_T

PIN_FLD_STATUS and PIN_FLD_STATUS_FLAGS in the PIN_FLD_STATUSES array in the PIN_FLD_SERVICES array are now mandatory.

PIN_FLD_PROFILE_OBJ in the PIN_FLD_PROFILES array is now mandatory.

Removed output fields

- PIN_FLD_BILLINFO array:
  - PIN_FLD_ACCOUNT_NO
  - PIN_FLD_MERCHANT
  - PIN_FLD_BILL_MODE
  - PIN_FLD_ACCESS_CODE1
  - PIN_FLD_ACCESS_CODE2

- PIN_FLD_SUBORD_INFO array in the PIN_FLD_INHERITED_INFO substruct in the PIN_FLD_PAYINFO array.

- PIN_FLD_DEALS array in the PIN_FLD_SERVICES array.

- PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_NAME
  - PIN_FLD_OWN_MAX
  - PIN_FLD_OWN_MIN

- PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array:
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_DEAL_OBJ
  - PIN_FLD_PLAN_OBJ
  - PIN_FLD_USAGE_DISCOUNT

- PIN_FLD_PERMITTED in the PIN_FLD_DISCOUNTS array in the PIN_FLD_DEAL_INFO substruct in the PIN_FLD_SERVICES array.

- PIN_FLD_FIELD array

**PCM_OP_CUST_CREATE_ACCT (input fields)**

New input fields

- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_TOPUP_INFO array
- PIN_FLD_ACCOUNT_TYPE in the PIN_FLD_ACCTINFO array.
- PIN_FLD_BAL_INFO array:
  - PIN_FLD_NAME
  - PIN_FLD_BILLINFO_OBJ
- PIN_FLD_PAYINFO array:
  - PIN_FLD_POID
  - PIN_FLD_PAY_TYPE
  - PAYMENT_OFFSESET

**Changed input fields**

- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- The following fields in the PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY
- PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_BILLINFO array is now optional.
- PIN_FLD_BILLINFO array in the PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_PARENT is now PIN_FLD_PARENT_FLAGS

**Removed input fields**

- PIN_FLD_FLAGS
- PIN_FLD_DEAL_OBJ in the PIN_FLD_ACCTINFO array.
- PIN_FLD_SUBORD_INFO array in the PIN_FLD_PAYINFO array.

**PCM_OP_CUST_CREATE_ACCT (output fields)**

**New output fields**

- PIN_FLD_CURRENCY
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_BAL_INFO array:
  - PIN_FLD_NAME
  - PIN_FLD_SERVICE_OBJ
- PIN_FLD_BILLINFO array:
  - PIN_FLD_BILLING_SEGMENT
  - PIN_FLD_EFFECTIVE_T
- PIN_FLD_PAYINFO array
- PIN_FLD_PROFILES array
- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_TOPUP_INFO array
- PIN_FLD_DESCR in the PIN_FLD_FIELD array.

**Changed output fields**
- PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_BILLINFO_OBJ and PIN_FLD_ACCOUNT_OBJ in the PIN_FLD_BAL_INFO array are now optional.
- PIN_FLD_BILLINFO array is now optional.
- PIN_FLD_BAL_GRP_OBJ in the PIN_FLD_BILLINFO array is now optional.
- PIN_FLD_RESULT is now optional.
- PIN_FLD_PARENT is now PIN_FLD_PARENT_FLAGS and it is now of type INT.

**Removed output fields**
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.
- PIN_FLD_SPONSOR array

**PCM_OP_CUST_CREATE_CUSTOMER (input fields)**

**New input fields**
- PIN_FLD_DESCR
- PIN_FLD_ON_DEMAND_INFO substruct
- PIN_FLD_ACCTINFO array:
  - PIN_FLD_DEAL_INFO substruct
  - PIN_FLD_ACCOUNT_TYPE
- PIN_FLD_BAL_INFO array:
  - PIN_FLD_NAME
  - PIN_FLD_BILLINFO_OBJ
- PIN_FLD_BAL_INFO in the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYINFO array:
  - PIN_FLD_POID
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_PAYMENT_OFFSET
- PIN_FLD_SERVICES array:
  - PIN_FLD_SUBSCRIPTION_INDEX
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_DEAL_INFO
- PIN_FLD_DEALS array in the PIN_FLD_SERVICES array:
  - PIN_FLD_TYPE
  - PIN_FLD_DEAL_INFO substruct
  - PIN_FLD_DISCOUNTS array
Changed Standard Opcodes

- PIN_FLD_PERMITTEDS array
- PIN_FLD_PARENT in the PIN_FLD_GROUP_INFO substruct.
- PIN_FLD_TOPUP_INFO array

Changed input fields

- PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_BILLINFO array in the PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_BILLINFO array is now optional.
- PIN_FLD_BILL_INFO_ID in the PIN_FLD_BILLINFO array is now PIN_FLD_BILLINFO_ID
- PIN_FLD_PARENT in the PIN_FLD_BILLINFO array is now PIN_FLD_PARENT_FLAGS and is of type INT.
- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- The following fields in the PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY
- PIN_FLD_DEAL_OBJ array in the PIN_FLD_DEALS array is now of type POID.

Removed input fields

- PIN_FLD_FLAGS
- PIN_FLD_SUBORD_INFO array in the PIN_FLD_INHERITED_INFO substruct.
- PIN_FLD_SUBSCRIPTION_OBJ and PIN_FLD_SUBSCRIPTION_INDEX in the PIN_FLD_SERVICES array.

PCM_OP_CUST_CREATE_CUSTOMER (output fields)
The output flist is changed to add purchased offering POIDs and package IDs. This supports sending data to an external customer relationship manager (CRM) system.

New output fields

- PIN_FLD_FLAGS
- PIN_FLD_ON_DEMAND_INFO substruct
- PIN_FLD_ACCTINFO array
- PIN_FLD_END_T
- PIN_FLD_START_T
- PIN_FLD_STATUSES array
- PIN_FLD_BAL_INFO array:
  - PIN_FLD_NAME
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_SERVICE_OBJ

  - PIN_FLD_BILLINFO array:
    - PIN_FLD_BILLINFO_ID
    - PIN_FLD_PAYINFO_OBJ
    - PIN_FLD_BAL_GRP_OBJ
    - PIN_FLD_PAY_TYPE
    - PIN_FLD_PARENT_FLAG
    - PIN_FLD_BILL_WHEN
    - PIN_FLD_ACTG_FUTURE_DOM
    - PIN_FLD_BILLING_STATUS
    - PIN_FLD_BILLING_STATUS_FLAGS
    - PIN_FLD_STATUS
    - PIN_FLD_STATUS_FLAGS
    - PIN_FLD_SPONSOR_FLAGS
    - PIN_FLD_SPONSOREE_FLAGS
    - PIN_FLD_AR_BILLINFO_OBJ
    - PIN_FLD_PARENT_BILLINFO_OBJ
    - PIN_FLD_BILLING_SEGMENT
    - PIN_FLD_EFFECTIVE_T

  - PIN_FLD_PAYINFO array:
    - PIN_FLD_POID
    - PIN_FLD_PAY_TYPE
    - PIN_FLD_PAYMENT_TERM
    - PIN_FLD_PAYMENT_OFFSET

  - PIN_FLD_LAST_NAME in the PIN_FLD_NAMEINFO array.

- PIN_FLD_SERVICES array:
  - PIN_FLD_SUBSCRIPTION_INDEX
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_BAL_INFO array
  - PIN_FLD_ALIAS_LIST array
  - PIN_FLD_PASSWD_STATUS
  - PIN_FLD_DEAL_INFO substruct

- PIN_FLD_DEALS array:
  - PIN_FLD_TYPE
  - PIN_FLD_DEAL_INFO substruct

- PIN_FLD_DEVICES array.
- PIN_FLD_SPONSOR array
- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_TOPUP_INFO array

**Changed output fields**
- PIN_FLD_ACCOUNT_OBJ is now mandatory.
- The following fields were moved into the PIN_FLD_ACCTINFO array:
  - PIN_FLD_AAC_ACCESS
  - PIN_FLD_AAC_SOURCE
  - PIN_FLD_AAC_VENDOR
  - PIN_FLD_AAC_PACKAGE
  - PIN_FLD_AAC_PROMO_CODE
  - PIN_FLD_AAC_SERIAL_NUM
- PIN_FLD_BAL_INFO array is now optional.
- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_ADDRESS, PIN_FLD_CITY, and PIN_FLD_COUNTRY in the PIN_FLD_NAMEINFO array are now mandatory.
- PIN_FLD_PHONE in the PIN_FLD_PHONES array in the PIN_FLD_NAMEINFO array is now mandatory.
- PIN_FLD_LOCALE in the PIN_FLD_LOCALES array is now mandatory.
- PIN_FLD_LOGIN and PIN_FLD_PASSWD_CLEAR in the PIN_FLD_SERVICES array are now optional.
- PIN_FLD_DEAL_OBJ array in the PIN_FLD_DEALS array is now of type POID.
- PIN_FLD_STATUS and PIN_FLD_STATUS_FLAGS in the PIN_FLD_STATUSES array in the PIN_FLD_DEALS array are now mandatory.
- PIN_FLD_PROFILE_OBJ in the PIN_FLD_PROFILES array is now mandatory.

**Removed output fields**
- PIN_FLD_BILLINFO array in the PIN_FLD_BAL_INFO array.
- PIN_FLD_STATUSES array
- PIN_FLD_BILLINFO array:
  - PIN_FLD_ACCOUNT_NO
  - PIN_FLD_MERCHANT
  - PIN_FLD_BILL_MODE
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_PARENT
  - PIN_FLD_BILL_WHEN
  - PIN_FLD_ACCESS_CODE1
  - PIN_FLD_ACCESS_CODE2
- PIN_FLD_SUBORD_INFO in the PIN_FLD_INHERITED_INFO substruct.
- PIN_FLD_ACTGINFO array
- PIN_FLD_ACTG_FUTURE_DOM
- PIN_FLD_ACTG_TYPE
- PIN_FLD_GL_SEGMENT
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_CREATE_PAYINFO**
*Removed output fields*
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_CREATE_PROFILE**
*New output fields*
- PIN_FLD_RESULTS array
*Removed output fields*
- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_CREATE_SERVICE**
*New input fields*
- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_SERVICE_ID
- PIN_FLD_TYPE
- PIN_FLD_EFFECTIVE_T
- PIN_FLD_INHERITED_INFO substruct
*Changed input fields*
- PIN_FLD_LOGIN is now mandatory.
- PIN_FLD_PASSWD_CLEAR is now mandatory.

**PCM_OP_CUST_FIND_PAYINFO**
*New input fields*
- PIN_FLD_BILLINFO_OBJ

**PCM_OP_CUST_INIT_SERVICE**
*New input fields*
- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_END_T
- PIN_FLD_START_T
- PIN_FLD_EFFECTIVE_T
*New output fields*
- PIN_FLD_FIELD array

**PCM_OP_CUST_MODIFY_BAL_GRP**
*New input fields*
■ PIN_FLD_ACCOUNT_OB

Changed input fields
■ PIN_FLD_BILLINFO_OBJ and PIN_FLD_NAME are now optional.

PCM_OP_CUST_MODIFY_CUSTOMER (input fields)
New input fields
■ PIN_FLD_PROGRAM_NAME
■ PIN_FLD_DEAL_INFO substruct in the PIN_FLD_ACCTINFO array.
■ PIN_FLD_SERVICES array:
  – PIN_FLD_SUBSCRIPTION_INDEX
  – PIN_FLD_SUBSCRIPTION_OBJ
  – PIN_FLD_BAL_INFO array
  – PIN_FLD_BAL_GRP_OBJ
  – PIN_FLD_PASSWD_STATUS
  – PIN_FLD_STATUSES array
  – PIN_FLD_PERMITTEDS array
■ PIN_FLD_DEAL_INFO array in the PIN_FLD_SERVICES array:
  – PIN_FLD_NAME
  – PIN_FLD_DESCR
  – PIN_FLD_START_T
  – PIN_FLD_END_T
  – PIN_FLD_FLAGS
■ PIN_FLD_PAYINFO array:
  – PIN_FLD_POID
  – PIN_FLD_PAY_TYPE
  – PIN_FLD_PAYMENT_TERM
  – PIN_FLD_PAYMENT_OFFSET
  – PIN_FLD_INV_TYPE
■ PIN_FLD_BAL_INFO array:
  – PIN_FLD_NAME
  – PIN_FLD_RULES array
■ PIN_FLD_BILLINFO array:
  – PIN_FLD_POID
  – PIN_FLD_BUSINESS_PROFILE_OBJ
  – PIN_FLD_BAL_INFO array
  – PIN_FLD_BAL_GRP_OBJ
  – PIN_FLD_BILLING_SEGMENT
■ PIN_FLD_DEALS array:
Changed Standard Opcodes

Opcode Changes from Portal 7.3 to BRM 7.3.1

- PIN_FLD_DEAL_OBJ
- PIN_FLD_TYPE
- PIN_FLD_DEAL_INFO substruct

**Changed input fields**

- PIN_FLD_CURRENCY is now mandatory.
- PIN_FLD_CURRENCY_SECONDARY is now mandatory.
- PIN_FLD_DEAL_INFO array in PIN_FLD_SERVICES array is now of type substruct.

**The following fields in PIN_FLD_PRODUCTS array in PIN_FLD_DEAL_INFO substruct are now mandatory:**

- PIN_FLD_CYCLE_DISCOUNT
- PIN_FLD_USAGE_END_T
- PIN_FLD_USAGE_START_T
- PIN_FLD_CYCLE_END_T
- PIN_FLD_CYCLE_START_T
- PIN_FLD_PRODUCT_OBJ
- PIN_FLD_PURCHASE_END_T
- PIN_FLD_PURCHASE_START_T
- PIN_FLD_USAGE_DISCOUNT
- PIN_FLD_CYCLE_DISCOUNT

**The following fields in the PIN_FLD_TOPUP_INFO array are now mandatory:**

- PIN_FLD_PAYINFO array
- PIN_FLD_BILLINFO array
- PIN_FLD_TOPUP_AMT

**PIN_FLD_BILL_INFO_ID in the PIN_FLD_BILLINFO array is now PIN_FLD_BILLINFO_ID.**

**The following fields in the PIN_FLD_DISCOUNTS array in the PIN_FLD_SERVICES array are now mandatory:**

- PIN_FLD_PURCHASE_START_T
- PIN_FLD_PURCHASE_END_T
- PIN_FLD_CYCLE_START_T
- PIN_FLD_CYCLE_END_T
- PIN_FLD_USAGE_START_T
- PIN_FLD_USAGE_END_T

**Removed input fields**

- PIN_FLD_ACCTINFO array:
  - PIN_FLD_AAC_ACCESS
  - PIN_FLD_AAC_SOURCE
- PIN_FLD_AAC_VENDOR
- PIN_FLD_AAC_PACKAGE
- PIN_FLD_AAC_PROMO_CODE
- PIN_FLD_AAC_SERIAL_NUM

- PIN_FLD_PRODUCTS array in the PIN_FLD_DEAL_INFO array:
  - PIN_FLD_NAME
  - PIN_FLD_OWN_MAX
  - PIN_FLD_OWN_MIN

- PIN_FLD_SERVICES array:
  - PIN_FLD_BAL_INFO array
  - PIN_FLD_BAL_GRP_OBJ
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_SUBSCRIPTION_INDEX

- PIN_FLD_DISCOUNTS array in the PIN_FLD_SERVICES array:
  - PIN_FLD_USAGE_DISCOUNT
  - PIN_FLD_PERMITTED

- PIN_FLD_DISCOUNTS array in the PIN_FLD_SERVICES array:
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_DEAL_OBJ
  - PIN_FLD_PLAN_OBJ

**PCM_OP_CUST_MODIFY_CUSTOMER (output fields)**
The output flist is changed to add purchased offering POIDs and package IDs. This supports sending data to an external customer relationship manager (CRM) system.

**New output fields**

- PIN_FLD_END_T
- PIN_FLD_START_T
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_ACCTINFO array
- PIN_FLD_SERVICES array:
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_SUBSCRIPTION_INDEX
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_SERVICE_ID
  - PIN_FLD_BAL_INFO array
  - PIN_FLD_ALIAS_LIST array
  - PIN_FLD_PASSWD_STATUS
- PIN_FLD_DEAL_OBJ
- PIN_FLD_DEALS array
- PIN_FLD_STATUSES array
- PIN_FLD_INHERITED_INFO substruct
- PIN_FLD_DEVICES array

- PIN_FLD_DEAL_INFO substruct in PIN_FLD_SERVICES array:
  - PIN_FLD_NAME
  - PIN_FLD_DESCR
  - PIN_FLD_START_T
  - PIN_FLD_END_T
  - PIN_FLD_FLAGS
  - PIN_FLD_PERMITTEDS array

- PIN_FLD_BILLINFO array
- PIN_FLD_BAL_INFO array
- PIN_FLD_PAYINFO array
- PIN_FLD_PROFILES array
- PIN_FLD_TOPUP_INFO array

**Changed output fields**

- PIN_FLD_LOGIN and PIN_FLD_PASSWORD_CLEAR in PIN_FLD_SERVICES array are now optional.
- PIN_FLD_DEAL_INFO array in PIN_FLD_SERVICES is now of type substruct.
- The following fields in the PIN_FLD_PRODUCTS array are now mandatory:
  - PIN_FLD_PRODUCT_OBJ
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_CYCLE_DISCOUNT
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T
  - PIN_FLD_USAGE_DISCOUNT

**Removed output fields**

- PIN_FLD_PRODUCTS array:
  - PIN_FLD_STATUS_FLAGS
  - PIN_FLD_NAME
  - PIN_FLD_OWN_MAX
  - PIN_FLD_OWN_MIN
Changed Standard Opcodes

**PIN_FLD_DISCOUNTS array:**
- **PIN_FLD_STATUS_FLAGS**
- **PIN_FLD_DEAL_OBJ**
- **PIN_FLD_PLAN_OBJ**
- **PIN_FLD_PERMITTED**

**PCM_OP_CUST_MODIFY_PAYINFO**

**Changed input fields**
- **PIN_FLD_INHERITED_INFO** substruct is now mandatory.

**New output fields**
- **PIN_FLD_PAYMENT_TERM**
- **PIN_FLD_PAYMENT_OFFSET**

**Removed output fields**
- **PIN_FLD_TYPE**

**PCM_OP_CUST_MODIFY_PROFILE**

**New input fields**
- **PIN_FLD_NAME**

**Removed output fields**
- **PIN_FLD_TYPE** in the **PIN_FLD_FIELD** array.
- **PCM_OP_CUST_PREP_CUSTOMER**

**New input fields**
- **PIN_FLD_DESCR**
- **PIN_FLD_ON_DEMAND_INFO** substruct
- **PIN_FLD_ACCTINFO** array:
  - **PIN_FLD_DEAL_INFO** substruct
  - **PIN_FLD_ACCOUNT_TYPE**
  - **PIN_FLD_CUSTOMER_SEGMENT_LIST**
- **PIN_FLD_BALINFO** array:
  - **PIN_FLD_NAME**
  - **PIN_FLD_BILLINFO_OBJ**
  - **PIN_FLD_RULES** array
- **PIN_FLD_BILLINFO** array:
  - **PIN_FLD_POID**
  - **PIN_FLD_BUSINESS_PROFILE_OBJ**
  - **PIN_FLD_BAL_INFO** array
  - **PIN_FLD_BILLING_SEGMENT**
- **PIN_FLD_PAYINFO** array:
  - **PIN_FLD_POID**
- PIN_FLD_PAY_TYPE
- PIN_FLD_PAYMENT_TERM
- PIN_FLD_PAYMENT_OFFSET
- PIN_FLD_INV_TYPE

**PIN_FLD_SERVICES array:**
- PIN_FLD_SUBSCRIPTION_INDEX
- PIN_FLD_SUBSCRIPTION_OBJ
- PIN_FLD_SERVICE_ID
- PIN_FLD_PASSWD_STATUS
- PIN_FLD_DEAL_INFO substruct
- PIN_FLD_DEALS array

**PIN_FLD_PARENT** in the PIN_FLD_GROUP_INFO substruct.

**Changed input fields**
- PIN_FLD_BILL_INFO_ID in the PIN_FLD_BILLINFO array is now PIN_FLD_BILLINFO_ID.
- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- PIN_FLD_LAST_NAME, PIN_FLD_ADDRESS, PIN_FLD_CITY, and PIN_FLD_COUNTRY in the PIN_FLD_NAMEINFO array are now mandatory.

**Removed input fields**
- PIN_FLD_FLAGS

**PCM_OP_CUST_PREP_CUSTOMER**
The output flist is changed to add purchased offering POIDs and package IDs. This supports sending data to an external customer relationship manager (CRM) system.

**New output flist**
- PIN_FLD_FLAGS
- PIN_FLD_ON_DEMAND_INFO substruct
- PIN_FLD_ACCTINFO array
- PIN_FLD_END_T
- PIN_FLD_START_T
- PIN_FLD_BAL_INFO array
- PIN_FLD_BILLINFO array:
  - PIN_FLD_POID
  - PIN_FLD_BUSINESSPROFILE_OBJ
  - PIN_FLD_BILLINFO_ID
  - PIN_FLD_PAYINFO_OBJ
  - PIN_FLD_BAL_GRP_OBJ
  - PIN_FLD_PAY_TYPE
- PIN_FLD_PARENT_FLAGS
- PIN_FLD_BILL_WHEN
- PIN_FLD_ACTG_FUTURE_DOM
- PIN_FLD_BILLING_STATUS
- PIN_FLD_BILLING_STATUS_FLAGS
- PIN_FLD_STATUS
- PIN_FLD_STATUS_FLAGS
- PIN_FLD_SPONSOR_FLAGS
- PIN_FLD_SPONSOREE_FLAGS
- PIN_FLD_AR_BILLINFO_OBJ
- PIN_FLD_PARENT_BILLINFO_OBJ
- PIN_FLD_BILLING_SEGMENT
- PIN_FLD_EFFECTIVE_T

- PIN_FLD_PAYINFO array:
  - PIN_FLD_POID
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_PAYMENT_TERM
  - PIN_FLD_PAYMENT_OFFESET
  - PIN_FLD_INV_TYPE

- PIN_FLD_SERVICES array:
  - PIN_FLD_SUBSCRIPTION_INDEX
  - PIN_FLD_SUBSCRIPTION_OBJ
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_SERVICE_ID
  - PIN_FLD_BAL_INFO array
  - PIN_FLD_ALIAS_LIST array
  - PIN_FLD_PASSWD_STATUS
  - PIN_FLD_DEAL_INFO substruct
  - PIN_FLD_DEALS array
  - PIN_FLD_PROFILES array
  - PIN_FLD_DEVICES array

- PIN_FLD_SPONSOR array
- PIN_FLD_GROUP_INFO substruct
- PIN_FLD_TOPUP_INFO array

**Changed output fields**

- PIN_FLD_ACCOUNT_OBJ is now mandatory.
- PIN_FLD_ACCTINFO array:
- PIN_FLD_DEAL_OBJ
- PIN_FLD_AAC_ACCESS
- PIN_FLD_AAC_SOURCE
- PIN_FLD_AAC_VENDOR
- PIN_FLD_AAC_PACKAGE
- PIN_FLD_AAC_PROMO_CODE
- PIN_FLD_AAC_SERIAL_NUM

- PIN_FLD_PAYINFO array is now mandatory.
- PIN_FLD_NAMEINFO array is now mandatory.
- The following fields in the PIN_FLD_NAMEINFO array are now mandatory:
  - PIN_FLD_LAST_NAME
  - PIN_FLD_ADDRESS
  - PIN_FLD_CITY
  - PIN_FLD_COUNTRY

- PIN_FLD_LOGIN and PIN_FLD_PASSWD_CLEAR in the PIN_FLD_SERVICES array are now optional.

**Removed output fields**

- PIN_FLD_BILLINFO array:
  - PIN_FLD_ACCOUNT_NO
  - PIN_FLD_MERCHANT
  - PIN_FLD_BILL_MODE
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_PARENT
  - PIN_FLD_BILL_WHEN
  - PIN_FLD_ACCESS_CODE1
  - PIN_FLD_ACCESS_CODE2

- PIN_FLD_SUBORD_INFO array in the PIN_FLD_PAYINFO array.

- PIN_FLD_LOCALES array:
  - PIN_FLD_ACTGINFO array
  - PIN_FLD_ACTG_FUTURE_DOM
  - PIN_FLD_ACTG_TYPE
  - PIN_FLD_GL_SEGMENT

- PIN_FLD_TYPE in the PIN_FL_FIELD array.

**PCM_OP_CUST_SET_ACCTINFO**

**New input fields**

- PIN_FLD_ACCTINFO array
- PIN_FLD_BRAND_INFO substruct
Changed input fields

- PIN_FLD_PROGRAM_NAME is now optional.
- The following fields were moved into the PIN_FLD_ACCTINFO array:
  - PIN_FLD_AAC_ACCESS
  - PIN_FLD_AAC_SOURCE
  - PIN_FLD_AAC_VENDOR
  - PIN_FLD_AAC_PACKAGE
  - PIN_FLD_AAC_PROMO_CODE
  - PIN_FLD_AAC_SERIAL_NUM

Removed input fields

- PIN_FLD_ACTG_TYPE
- PIN_FLD_GL_SEGMENT
- PIN_FLD_CURRENCY
- PIN_FLD_CURRENCY_SECONDARY
- PIN_FLD_DEAL_OBJ
- PIN_FLD_ACCESS_CODE1
- PIN_FLD_ACCESS_CODE2
- PIN_FLD_BUSINESS_TYPE
- PIN_FLD_CUSTOMER_SEGMENT_LIST
- PIN_FLD_BAL_INFO array

Removed output fields

- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_BAL_GRP**

Changed input fields

- PIN_FLD_PROGRAM_NAME is now mandatory.
- PIN_FLD_BILLINFO_OBJ and PIN_FLD_NAME fields in the PIN_FLD_BAL_INFO array are now optional.

**PCM_OP_CUST_SET_BRANDINFO**

Removed output fields

- PIN_FLD_FIELD array:
  - PIN_FLD_TYPE
  - PIN_FLD UNKNOWN

**PCM_OP_CUST_SET_LOCALE**

New input fields

- PIN_FLD_BILLINFO_OBJ
- PIN_FLD_TIMEZONE_ID
- PIN_FLD_EVENT_NO
■ PIN_FLD_FLAGS
■ PIN_FLD_QUANTITY

New output fields
■ PIN_FLD_RESULT

Removed output fields
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_LOGIN**
Removed output fields
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_NAMEINFO**
Removed output field
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_PASSWD**
Removed output fields
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_PAYINFO**
Removed output fields
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_STATUS**
New output fields
■ PIN_FLD_OBJECT
■ PIN_FLD_RESULTS array:
  – PIN_FLD_ACCOUNT_OBJ
  – PIN_FLD_SERVICE_OBJ

Removed output fields
■ PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_SET_TAXINFO**
Removed input fields
■ PIN_FLD_SERVICE_OBJ
■ PIN_FLD_DESCR
■ PIN_FLD_START_T
■ PIN_FLD_END_T

**PCM_OP_CUST_UPDATE_CUSTOMER** (input fields)
New input fields
■ PIN_FLD_ACCTINFO array:
- PIN_FLD_ACCOUNT_TYPE
- PIN_FLD_ACCESS_CODE1
- PIN_FLD_ACCESS_CODE2

PIN_FLD_BAL_INFO array:
- PIN_FLD_POID
- PIN_FLD_NAME
- PIN_FLD_BILLINFO array
- PIN_FLD_LIMIT array
- PIN_FLD_RULES array

PIN_FLD_BILLINFO array:
- PIN_FLD_BUSINESS_PROFILE_OBJ
- PIN_FLD_PAYINFO array
- PIN_FLD_BAL_INFO array
- PIN_FLD_BAL_GRP_OBJ

PIN_FLD_PAYINFO array:
- PIN_FLD_POID
- PIN_FLD_PAY_TYPE
- PIN_FLD_PAYMENT_OFFESET
- PIN_FLD_INV_TYPE

PIN_FLD_TOPUP_INFO array:
- PIN_FLD_PAYINFO array
- PIN_FLD_BILLINFO array

PIN_FLD_BAL_INFO array in the PIN_FLD_GROUP_TOPUP_MEMBERS array.

Changed input fields
- PIN_FLD_TYPE in the PIN_FLD_PHONES array is now optional.
- PIN_FLD_BILL_INFO_ID in the PIN_FLD_BILLINFO array is now PIN_FLD_BILLINFO_ID.
- PIN_FLD_POID in the PIN_FLD_PROFILES array is now PIN_FLD_PROFILE_OBJ.
- PIN_FLD_TOPUP_AMT in the PIN_FLD_TOPUP_INFO array is now mandatory.

Removed input fields
- PIN_FLD_ACCTINFO array
  - PIN_FLD_ACTG_TYPE
  - PIN_FLD_GL_SEGMENT
- PIN_FLD_BAL_GRP_OBJ in the PIN_FLD_BAL_INFO array.

PCM_OP_CUST_UPDATE_CUSTOMER (output fields)
New output fields
Changed Standard Opcodes

**Opcode Changes from Portal 7.3 to BRM 7.3.1**

- PIN_FLD_ACCTINFO array
- PIN_FLD_BAL_INFO array
- PIN_FLD_PAYINFO array
- PIN_FLD_BILLINFO array
- PIN_FLD_TOPUP_INFO array

**Removed output fields**

- PIN_FLD_RESULTS array
- PIN_FLD_TYPE in the PIN_FLD_FIELDS array.

**PCM_OP_CUST_UPDATE_SERVICES**

**New input fields**

- PIN_FLD_COMMAND in the PIN_FLD_SERVICES array.

**Changed input fields**

- PIN_FLD_NAME in the PIN_FLD_ALIAS_LIST array is now mandatory.

**New output fields**

- PIN_FLD_RESULTS array:
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_ACCOUNT_OBJ

**Removed output fields**

- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**PCM_OP_CUST_VALIDATE_FLD**

**Removed input fields**

- PIN_FLD_TYPE

**PCM_OP_CUST_VALIDATE_CUSTOMER**

**Changed input fields**

- PIN_FLD_ACTG_TYPE and PIN_FLD_GL_SEGMENT were moved into the PIN_FLD_ACCTINFO array.

**Removed output fields**

- PIN_FLD_TYPE in the PIN_FLD_FIELD array.

**Device FM Standard Opcodes**

The following Device FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OPDEVICE_ASSOCIATE**

**New output fields**

- PIN_FLD_FLAGS
- PIN_FLD_END_T
- PIN_FLD_EXTENDED_INFO substruct
Changed Standard Opcodes

**PCM_OP_DEVICE_CREATE**
- Removed input fields
  - PIN_FLD_SOURCE
  - PIN_FLD_MANUFACTURER

**PCM_OPDEVICE_SET_BRAND**
- New input fields
  - PIN_FLD_NEW_BRAND

**Filter Set FM Standard Opcodes**
The following Filter Set FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_FILTER_SET_CREATE**
- New input fields
  - PIN_FLD_ACCOUNT_OBJ

**PCM_OP_FILTER_SET_UPDATE**
- Changed input fields
  - PIN_FLD_DESC is now mandatory.

**Group FM Standard Opcodes**
The following Group FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GROUP_ADD_MEMBER**
- Removed input fields
  - PIN_FLD_SESSION_OBJ
  - PIN_FLD_DESCR

**PCM_OP_GROUP_CREATE_GROUP**
- New input fields
  - PIN_FLD_ACCOUNT_OBJ

**PCM_OP_GROUP_DELETE_MEMBER**
- New input fields
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_BAL_GRP_OBJ
  - PIN_FLD_TIMEZONE_ID
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_SERVICE_OBJ
  - PIN_FLD_EVENT_NO
  - PIN_FLD_FLAGS
• PIN_FLD_QUANTITY
• PIN_FLD_ITEM_OBJ

**Changed input fields**

• PIN_FLD_MEMBERS array is now optional.

**New output fields**

• PIN_FLD_ACCOUNT_OBJ
• PIN_FLD_SERVICE_OBJ
• PIN_FLD_POID

**Removed output fields**

• PIN_FLD_OBJECT

**PCM_OP_GROUP_SET_PARENT**

**New input fields**

• PIN_FLD_PARENT
• PIN_FLD_ACCOUNT_OBJ
• PIN_FLD_BAL_GRP_OBJ
• PIN_FLD_TIMEZONE_ID
• PIN_FLD_BILLINFO_OBJ
• PIN_FLD_SERVICE_OBJ
• PIN_FLD_EVENT_NO
• PIN_FLD_FLAGS
• PIN_FLD_QUANTITY
• PIN_FLD_ITEM_OBJ

**New output fields**

• PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_SERVICE_OBJ

**GSM AAA Manager FM Standard Opcodes**

The following GSM AAA Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GSM_AAA_START_ACCOUNTING**

**New input fields**

• PIN_FLD_BYTES_IN
• PIN_FLD_BYTES_OUT
• PIN_FLD_REQ_BYTES_IN
• PIN_FLD_REQ_BYTES_OUT
**GSM Manager FM Standard Opcodes**

The following GSM Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_GSM_AAA_STOP_ACCOUNTING**

- New input fields
  - PIN_FLD_REQ_BYTES_IN
  - PIN_FLD_REQ_BYTES_OUT

**PCM_OP_GSM_AAA_UPDATE_ACCOUNTING**

- New input fields
  - PIN_FLD_REQ_BYTES_IN
  - PIN_FLD_REQ_BYTES_OUT

**IC FM Standard Opcodes**

The following IC FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_IC_LOAD_SMS_REPORT**

- New input fields
  - PIN_FLD_SMS_DAY UNKNOWN [0]

- Removed input fields
  - PIN_FLD_HOSTNAME

**Invoicing FM Standard Opcodes**

The following Invoicing FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_INV_DECODE_INVOICE_DATA**

- Removed output fields
  - PIN_FLD_EXTENDED_INFO substruct

**PCM_OP_INV_MAKE_INVOICE**

- Changed input fields
  - PIN_FLD_BILLINFO array is now mandatory.
**PCM_OP_INV_VIEW_INVOICE**

New output fields
- PIN_FLD_BUFFER in the PIN_FLD_FORMATS array.

Changed output fields
- PIN_FLD_HEADER_NUM and PIN_FLD_HEADER_STR are now optional.

---

**Number Manager FM Standard Opcodes**

The following Number Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_NUM_SPLIT_BLOCK**

New input fields
- PIN_FLD_LOCALE

---

**Order Manager FM Standard Opcodes**

The following Order Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_ORDER_UPDATE**

New input fields
- PIN_FLD_EXTENDED_INFO array:
  - PIN_FLD_ORDERS_DATA array
  - PIN_FLD_ORDER_OBJ

Removed input fields
- PIN_FLD_ORDER_OBJ in the PIN_FLD_ORDERS_DATA array.

---

**Payment FM Standard Opcodes**

The following Payment FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PYMT_APPLY_FEE**

Changed input fields
- PIN_FLD_COMMAND is now mandatory.
- PIN_FLD_STATUS is now optional.

**PCM_OP_PYMT_CHARGE**

Changed input fields
- PIN_FLD_CHARGES array is now mandatory.
- PIN_FLD_PAY_TYPE is now mandatory.

Changed output fields
- PIN_FLD_STATUS is now optional.
**PCM_OP_PYMT_CHARGE_CC**

- **Changed input fields**
  - PIN_FLD_CHARGES array is now mandatory.

- **Changed output fields**
  - PIN_FLD_CHARGES array is now mandatory.

**PCM_OP_PYMT_CHARGE_DD**

- **Changed input fields**
  - PIN_FLD_CHARGES array is now mandatory.

- **Changed output fields**
  - PIN_FLD_CHARGES array is now mandatory.

**PCM_OP_PYMT_CHARGE_DDEBIT**

- **Changed input fields**
  - PIN_FLD_CHARGES array is now mandatory.

- **Changed output fields**
  - PIN_FLD_CHARGES array is now mandatory.

**PCM_OP_PYMT_COLLECT**

- **New input fields**
  - PIN_FLD_AMOUNT

- **New output fields**
  - PIN_FLD_RESULTS array:
    - PIN_FLD_ITEM_NO

- **Changed output fields**
  - PIN_FLD_RESULTS array:
    - PIN_FLD_ACCOUNT_OBJ is now mandatory.

**PCM_OP_PYMT_GET_ACH_INFO**

- **Changed output fields**
  - PIN_FLD_RESULTS array is now mandatory.

**PCM_OP_PYMT_GRANT_INCENTIVE**

- **Changed input fields**
  - PIN_FLD_PAY_TYPE in the PIN_FLD_INCENTIVE substruct is now mandatory.

- **Removed input fields**
  - PIN_FLD_TRANS_ID in the PIN_FLD_INCENTIVE substruct

**PCM_OP_PYMT_RECOVER**

- **New input fields**
  - PIN_FLD_SERVICE_OBJ

- **Changed input fields**
- PIN_FLD_PAY_TYPE in the PIN_FLD_CHARGES array is now mandatory.

**Changed output fields**
- PIN_FLD_STATUS in the PIN_FLD_RESULTS array is now optional.

**PCM_OP_PYMT_RECOVER_CC**

**New input fields**
- PIN_FLD_POID_VAL in the PIN_FLD_BATCH_INFO array.

**PCM_OP_PYMT_RECOVER_DD**

**New input fields**
- PIN_FLD_POID_VAL in the PIN_FLD_BATCH_INFO array.

**PCM_OP_PYMT_RECYCLE_PAYMENT**

**Changed input fields**
- PIN_FLD_STATUS in the PIN_FLD_CHARGES array is now optional.

**PCM_OP_PYMT_RECYCLED_PAYMENTS_SEARCH**

**Changed output fields**
- PIN_FLD_STATUS in the PIN_FLD_PAYMENT substruct is now optional.

**PCM_OP_PYMT_REVERSE_INCENTIVE**

**Changed input fields**
- PIN_FLD_EVENT_OBJ is now mandatory.

**Removed input fields**
- PIN_FLD_REVERSAL_EVENT_OBJ

**PCM_OP_PYMT_SELECT_ITEMS**

**Changed input fields**
- PIN_FLD_PAY_TYPE and PIN_FLD_COMMAND are now mandatory.

**Changed output fields**
- The following fields were moved into the PIN_FLD_CHARGES array:
  - PIN_FLD_AMOUNT
  - PIN_FLD_CURRENCY
  - PIN_FLD_ACTG_TYPE
  - PIN_FLD_SELECT_RESULT
  - PIN_FLD_SELECT_STATUS
  - PIN_FLD_BILLINFO_OBJ
  - PIN_FLD_PAYINFO_OBJ
  - PIN_FLD_MERCHANT
  - PIN_FLD_ACH
  - PIN_FLD_PAY_TYPE
  - PIN_FLD_COMMAND
- PIN_FLD_ITEMS array
- PIN_FLD_EVENTS array

**PCM_OP_PYMT_TOPUP**

**Changed input fields**
- PIN_FLD_TYPE in the PIN_FLD_DD_INFO array in the PIN_FLD_PAYINFO array is now optional.

**New output fields**
- PIN_FLD_VOUCHERS_INFO array:
  - PIN_FLD_EXPIRATION_T

**Permissioning FM Standard Opcodes**

The following Permissioning FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PERM_ACL_GROUP_MODIFY**

**Changed input fields**
- PIN_FLD_NAME is now mandatory.

**Price FM Standard Opcodes**

The following standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_PRICE_COMMIT_PRODUCT**

**Removed input fields**
- PIN_FLD_TAX_SUPPLIER in the PIN_FLD_PRODUCTS array

**Changed input fields**
- PIN_FLD_SELECTOR_RULESET is now PIN_FLD_SELECTOR_RULESET array.
- PIN_FLD_SELECTOR_RULES is now PIN_FLD_SELECTOR_RULES array.
- PIN_FLD_SELECTOR_RULE_LNK is now PIN_FLD_SELECTOR_RULE_LINK array.
- PIN_FLD_SELECTOR_DETAILS is now PIN_FLD_SELECTOR_DETAILS array.

**PCM_OP_PRICE_GET_PRICE_LIST**

**Removed output fields**
- PIN_FLD_TAX_SUPPLIER in the PIN_FLD_PRODUCTS array.

**PCM_OP_PRICE_GET_PRODUCT_INFO**

**Removed output fields**
- PIN_FLD_BAL_IMPACTS array in the PIN_FLD_QUANTITY_TIERS array:
  - PIN_FLD_START_T
  - PIN_FLD_END_T
  - PIN_FLD_UNKNOWN
**PCM_OP_PRICE_PREP_TAILORMADE_PRODUCT** (input fields)

**New input fields**
- PIN_FLD_RATES array in the PIN_FLD_RATE_TIERS array:
  - PIN_FLD_PRORATE_FIRST
  - PIN_FLD_PRORATE_LAST
  - PIN_FLD_TYPE
  - PIN_FLD_STEP_TYPE
  - PIN_FLD_STEP_RESOURCE_ID

- PIN_FLD_PIPELINE_RATEPLANS array in the PIN_FLD_RATE_PLANS array:
  - PIN_FLD_VALID_FROM
  - PIN_FLD_STATUS_STR
  - PIN_FLD_ZONEMODEL
  - PIN_FLD_BASIC
  - PIN_FLD_BASIC_RATEPLAN

**Changed input fields**
- PIN_FLD_DERIVED_FROM_OBJ is now PIN_FLD_BASE_PRODUCT_OBJ
- PIN_FLD_RATES array was moved into the PIN_FLD_RATE_TIERS array.
- PIN_FLD_PIPELINE_RATEPLANS array was moved into PIN_FLD_RATE_PLANS array.
- PIN_FLD_SELECTOR_RULESET is now PIN_FLD_SELECTOR_RULESET array.

**PCM_OP_PRICE_PREP_TAILORMADE_PRODUCT** (output fields)

**New output fields**
- PIN_FLD_SEPARATER in the PIN_FLD_COLUMNS array in the PIN_FLD_SELECTOR_TREE substruct.
- PIN_FLD_RATE_PLANS array in the PIN_FLD_PRODUCTS array
  - PIN_FLD_EVENT_TYPE
  - PIN_FLD_TAX_CODE
  - PIN_FLD_TAX_WHEN
  - PIN_FLD_BILL_OFFSET
  - PIN_FLD_OFFSET_UNIT
- PIN_FLD_PRIORITY in the PIN_FLD_RATE_TIERS array in the PIN_FLD_RATE_PLANS array.
- PIN_FLD_BAL_IMPACTS array in the PIN_FLD_QUANTITY_TIERS array:
  - PIN_FLD_RELATIVE_START_OFFSET
  - PIN_FLD_RELATIVE_START_UNIT
  - PIN_FLD_RELATIVE_END_OFFSET
  - PIN_FLD_RELATIVE_END_UNIT

**Changed output fields**
Changed Standard Opcodes

■ PIN_FLD_TAX_SUPPLIER_ID in the PIN_FLD_PRODUCTS array is now PIN_FLD_SUPPLIER_NAME
■ PIN_FLD_SELECTOR in the PIN_FLD_RATE_PLAN_SELECTOR substruct is now PIN_FLD_SELECTOR_TREE
■ PIN_FLD_FIXED_OPERAND is now PIN_FLD_FIXED_AMOUNT in the PIN_FLD_BAL_IMPACTS array in the PIN_FLD_QUANTITY_TIERS array.
■ PIN_FLD_SCALED_OPERAND is now PIN_FLD_SCALED_AMOUNT in the PIN_FLD_BAL_IMPACTS array in the PIN_FLD_QUANTITY_TIERS array.
■ PIN_FLD_SELECTOR_RULESET in the PIN_FLD_MODEL_SELECTORS array is now PIN_FLD_SELECTOR_RULESET array.
■ PIN_FLD_SELECTOR_RULE_LNK in the PIN_FLD_SELECTOR_RULES array is now PIN_FLD_SELECTOR_RULE_LINK array.

Removed output fields
■ PIN_FLD_RATES array in the PIN_FLD_RATE_PLANS array:
  – PIN_FLD_TAX_CODE
  – PIN_FLD_TAX_WHEN

Process Audit FM Standard Opcodes

The following Process Audit FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_PROCESS_AUDIT_CREATE
New input fields
■ PIN_FLD_ACCOUNT_OBJ
■ PIN_FLD_PROCESS_NAME
■ PIN_FLD_TOTAL_RECORDS
■ PIN_FLD_SUCCESSFUL_RECORDS
■ PIN_FLD_FAILED_RECORDS
■ PIN_FLD_BILLING_INFO substruct

Removed input fields
■ PIN_FLD_PIPE_LINE_INFO substruct
■ PIN_FLD_FAILED_CDRS array

PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK
Changed input fields
■ PIN_FLD_USAGE_START_T, PIN_FLD_USAGE_END_T, and PIN_FLD_EVENT_COUNT were moved into the PIN_FLD_GROUP_DETAILS array.

PCM_OP_PROCESS_AUDIT_CREATE_WRITEOFF_SUMMARY
New input fields
■ PIN_FLD_ACTIONS array
■ PIN_FLD_POID
<table>
<thead>
<tr>
<th>New output fields</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN_FLD_POID</td>
</tr>
</tbody>
</table>

**PCM_OP_PROCESS_AUDIT_LINK**

**Changed input fields**

- PIN_FLD_ORIGINAL_BATCH_ID and PIN_FLD_SUSPENDED_FROM_BATCH_ID were moved to level 0.

**New output fields**

- PIN_FLD_ORIGINAL_BATCH_ID
- PIN_FLD_SUSPENDED_FROM_BATCH_ID

---

**RADIUS Manager FM Standard Opcodes**

The following RADIUS Manager standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_TERM_IP_DIALUP_STOP_ACCOUNTING**

**Removed input fields**

- PIN_FLD_STATUS

---

**Rating FM Standard Opcodes**

The following Rating FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_RATE_TAX_CALC (input fields)**

**New input fields**

- PIN_FLD_COMMAND
- PIN_FLD_TAXPKG_TYPE in PIN_FLD_TAXES array.
- PIN_FLD_TAX_SUPPLIER
- PIN_FLD_NAME
- PIN_FLD_LOCATION
- PIN_FLD_VAT_CERT
- PIN_FLD_NAME
- PIN_FLD_LOCATION

**Changed input fields**

- The following fields in PIN_FLD_TAXES array are now optional:
  - PIN_FLD_SHIP_TO
  - PIN_FLD_LOCATION_MODE
  - PIN_FLD_AMOUNT_TAXED

**Removed input fields**
Changed Standard Opcodes

- PIN_FLD_FLAGS
- PIN_FLD_ACCOUNT_NO
- PIN_FLD_CURRENCY_NAME
- PIN_FLD_TYPE and PIN_FLD_PERCENT in the PIN_FLD_EXEMPTIONS array.
- PIN_FLD_TAXES array:
  - PIN_FLD_ORDER_ACCEPT
  - PIN_FLD_ORDER_ORIGIN
  - PIN_FLD_SHIP_FROM
  - PIN_FLD_COMMAND
  - PIN_FLD_INTERNATIONAL_IND
  - PIN_FLD_SERVICE_TYPE
- PIN_FLD_RESIDENCE_FLAG
- PIN_FLD_INCORPORATED_FLAG
- PIN_FLD_BILL_OBJ

**PCM_OP_RATE_TAX_CALC (output fields)**

**New output fields**
- PIN_FLD_TAX_SUPPLIER
- PIN_FLD_ITEM_OBJ
- PIN_FLD_TAX_SUPPLIER_INFO substruct
- PIN_FLD_EXEMPTIONS array
- PIN_FLD_VAT_CERT
- PIN_FLD_NAMEINFO array
- PIN_FLD_TELEPHONY substruct
- PIN_FLD_TELCO_INFO substruct
- PIN_FLD_WIRELESS_INFO substruct
- PIN_FLD_GSM_INFO substruct

**Changed output fields**
- PIN_FLD_TAXPKG_TYPE in PIN_FLD_TAXES array is now optional.

**PCM_OP_RATE_TAX_EVENT (input fields)**

**New input fields**
- PIN_FLD_BAL_GRP_OBJ in the PIN_FLD_BAL_IMPACTS array.

**Changed input fields**
- PIN_FLD_START_T is now mandatory.

**Removed input fields**
- PIN_FLD_SERVICE_OBJ
- PIN_FLD_SESSION_OBJ
- PIN_FLD_CURRENCY
- PIN_FLD_FLAGS
- PIN_FLD_MIN_UNIT
- PIN_FLD_BAL_IMPACTS array:
  - PIN_FLD_PERCENT
  - PIN_FLD_PRODUCT_OBJ
  - PIN_FLD_RATE_OBJ
  - PIN_FLD_IMPACT_CATEGORY
  - PIN_FLD_GL_ID
  - PIN_FLD_OFFERING_OBJ
  - PIN_FLD_QUANTITY
  - PIN_FLD_RATE_TAG
  - PIN_FLD_IMPACT_TYPE
  - PIN_FLD_LINEAGE
  - PIN_FLD_DISCOUNT
- PIN_FLD_DISCOUNT
- PIN_FLD_PRODUCT substruct
- PIN_FLD_TIMEZONE_MODE
- PIN_FLD_USERID
- PIN_FLD_TOD_MODE
- PIN_FLD_PROGRAM_NAME
- PIN_FLD_SYS_DESCR
- PIN_FLD_TIMEZONE_ADJ_START_T
- PIN_FLD_TIMEZONE_ADJ_END_T
- PIN_FLD_CYCLE_INFO substruct
- PIN_FLD_NET_QUANTITY
- PIN_FLD_INCR_QUANTITY
- PIN_FLD_EARNED_END_T
- PIN_FLD_MIN_QUANTITY
- PIN_FLD_NAME
- PIN_FLD_UNIT
- PIN_FLD_ROUNDING_MODE
- PIN_FLD_TAX_SUPPLIER
- PIN_FLD_EARNED_TYPE
- PIN_FLD_RUM_NAME
- PIN_FLD_TOTAL array
- PIN_FLD_INCR_UNIT
PCM_OP_RATE_TAX_EVENT (output fields)
New output fields
- PIN_FLD_BAL_IMPACTS array

Changed output fields
- PIN_FLD_TAX_LOCALES is now optional.

Remittance FM Standard Opcodes
The following Remittance FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_REMIT_GET_PROVIDER
Changed input fields
- PIN_FLD_UNIT was moved from PIN_FLD_BAL_IMPACTS array to level 0.

Resource Reservation FM Standard Opcodes
The following Resource Reservation FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_reserve_EXTEND
New input fields
- PIN_FLD_RESERVATION_NO
- PIN_FLD_RESERVATION_STATUS

Changed input fields
- PIN_FLD_RESERVATION_MODE is now of type ENUM.

SDK FM Standard Opcodes
The following SDK FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_SDK_DEL_FLD_SPECS
Changed input fields
- PIN_FLD_FIELD array is now mandatory.
- PIN_FLD_FIELD_NAME in PIN_FLD_FIELD array is now optional.

PCM_OP_SDK_DEL_OBJ_SPECS
Changed input fields
- PIN_FLD_OBJ_DESC array is now mandatory.
- PIN_FLD_ACTION in PIN_FLD_OBJ_DESC array is now mandatory.

Changed output fields
- PIN_FLD_RESULTS array is now mandatory.
- PIN_FLD_DESCR in PIN_FLD_RESULTS array is now optional.
PCM_OP_SDK_GET_FLD_SPECS

Changed input fields
- PIN_FLD_FIELD array is now mandatory.
- PIN_FLD_FIELD_NAME in PIN_FLD_FIELD array is now optional.

Changed output fields
- PIN_FLD_FIELD array is now mandatory.
- PIN_FLD_FIELD_NAME and PIN_FLD_DESCR in the PIN_FLD_FIELD array are now optional.

PCM_OP_SDK_GET_OBJ_SPECS

Changed input fields
- PIN_FLD_OBJ_DESC array is now mandatory.
- PIN_FLD_NAME in PIN_FLD_OBJ_DESC array is now optional.

Changed output fields
- PIN_FLD_OBJ_DESC array is now mandatory.
- The following fields in the PIN_FLD_OBJ_DESC array are now optional:
  - PIN_FLD_READ_ACCESS
  - PIN_FLD_WRITE_ACCESS
  - PIN_FLD_AUDIT_FLAG
  - PIN_FLD_CREATE_ACCESS
  - PIN_FLD_DESCR
  - PIN_FLD_LABEL
  - PIN_FLD_NAME
- PIN_FLD_OBJ_ELEM array is now mandatory.
- The following fields in the PIN_FLD_OBJ_ELEM array are now optional:
  - PIN_FLD_AUDITABLE
  - PIN_FLD_CREATE_PERMISSION
  - PIN_FLD_DESCR
  - PIN_FLD_ENCRYPTABLE
  - PIN_FLD_FIELD_NAME
  - PIN_FLD_LABEL
  - PIN_FLD_LENGTH
  - PIN_FLD_MOD_PERMISSION
  - PIN_FLD_ORDER

PCM_OP_SDK_SET_FLD_SPECS

Changed input fields
- PIN_FLD_FIELD array is now mandatory.
- The following fields in the PIN_FLD_FIELD array are now optional:
Changed Standard Opcodes

– PIN_FLD_FIELD_NAME
– PIN_FLD_FIELD_TYPE
– PIN_FLD_STATUS

PCM_OP_SDK_SET_OBJ_SPECS

Changed input fields

■ PIN_FLD_OBJ_DESC array is now mandatory.
■ The following fields in the PIN_FLD_OBJ_DESC array are now optional:
  – PIN_FLD_READ_ACCESS
  – PIN_FLD_NAME
■ The following fields in the PIN_FLD_OBJ_DESC array are now mandatory:
  – PIN_FLD_WRITE_ACCESS
  – PIN_FLD_SM_INFO
■ PIN_FLD_OBJ_ELEM array is now mandatory.
■ The following fields in the PIN_FLD_OBJ_ELEM array are now optional:
  – PIN_FLD_CREATE_PERMISSION
  – PIN_FLD_FIELD_NAME
  – PIN_FLD_MOD_PERMISSION
■ PIN_FLD_SM_INFO in PIN_FLD_OBJ_ELEM array is now mandatory.

Changed output fields

■ PIN_FLD_RESULTS array is now mandatory.

Subscription FM Standard Opcodes

The following Subscription FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_SUBSCRIPTION_CALC_BEST_PRICING

New input fields

■ PIN_FLD_SESSION_OBJ

New output fields

■ PIN_FLD_POID in PIN_FLD_RESULTS array is now optional.
■ PIN_FLD_RESULTS array:
  – PIN_FLD_SERVICE_OBJ
  – PIN_FLD_BASE_DEALINFO array
  – PIN_FLD_BEST_DEALINFO array

PCM_OP_SUBSCRIPTION_CANCEL_DEAL

New input fields

■ PIN_FLD_DEAL_OBJ
**PCM_OP_SUBSCRIPTION_CANCEL_DISCOUNT**

**Changed input fields**
- PIN_FLD_QUANTITY in PIN_FLD_DISCOUNTS array is now mandatory.

**New output fields**
- PIN_FLD_ACCOUNT_OBJ

**Removed output fields**
- PIN_FLD_UNKNOWN [0]

**PCM_OP_SUBSCRIPTION_CANCEL_PRODUCT**

**New input fields**
- PIN_FLD_STATUS_FLAGS in the PIN_FLD_STATUSES array.

**Changed input fields**
- PIN_FLD_STATUSES array in PIN_FLD_PRODUCTS array is now optional.

**New output fields**
- PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_CYCLE_INFO substruct

**PCM_OP_SUBSCRIPTION_CANCEL_SUBSCRIPTION**

**Removed input fields**
- PIN_FLD_SESSION_OBJ

**New output fields**
- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_SUBSCRIPTION_CHANGE_DEAL**

**New output fields**
- PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_CYCLE_INFO substruct
  - PIN_FLD_PRODUCTS array
  - PIN_FLD_DISCOUNTS array

- PIN_FLD_RESULTS array in the PIN_FLD_RESULTS array:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_CYCLE_INFO substruct

**Changed output fields**
- PIN_FLD_RESULTS array in PIN_FLD_RESULTS array is now optional.
PCM_OP_SUBSCRIPTION_COUNT_LINES
Changed output fields
- PIN_FLD_RESULTS array is now optional.

PCM_OP_SUBSCRIPTION_CYCLE_FOLDER
Changed input fields
- PIN_FLD_SERVICE_OBJ in PIN_FLD_BAL_INFO array is now mandatory.

Removed input fields
- PIN_FLD_SESSION_OBJ
- PIN_FLD_DESCR
- PIN_FLD_START_T
- PIN_FLD_TIMEZONE_ID
- PIN_FLD_CREDIT_PROFILE in the PIN_FLD_BALANCES array in the PIN_FLD_BAL_INFO array.

Removed output fields
- PIN_FLD_RESULTS array

PCM_OP_SUBSCRIPTION_GET_PURCHASED_OFFERINGS
Changed output fields
- PIN_FLD_POID is now optional.

PCM_OP_SUBSCRIPTION_PROVISIONERA
Changed output fields
- PIN_FLD_FIELD array:
  - PIN_FLD_FIELD_NUM
  - PIN_FLD_TYPE
  - PIN_FLD_ELEMENT_ID
  - PIN_FLD_RESULT
  - PIN_FLD_DESCR
  - PIN_FLD_FIELD

PCM_OP_SUBSCRIPTION_PURCHASE_DEAL
Changed to support sending product and discount data to an external customer relationship manager (CRM) system. See “How Deals are Purchased” in BRM Managing Customers.

New input fields
- PIN_FLD_DEAL_INFO substruct:
  - PIN_FLD_DEAL_OBJ
  - PIN_FLD_PLAN_OBJ

 Changed input fields
- PIN_FLD_DEAL_INFO substruct is now mandatory.
- The following fields in PIN_FLD_DEAL_INFO are now optional:
  - PIN_FLD_POID
  - PIN_FLD_NAME
  - PIN_FLD_DESCR
  - PIN_FLD_START_T
  - PIN_FLD_END_T
- PIN_FLD_PRODUCTS array is now optional.
- PIN_FLD_PURCHASE_DISCOUNT in PIN_FLD_PRODUCTS array is now optional.
- PIN_FLD_DISCOUNTS array is now optional.

**Removals**
- PIN_FLD_ UNKNOWN [0]

**New Output Fields**
- PIN_FLD_PRODUCTS array
- PIN_FLD_DISCOUNTS array
- PIN_FLD_RESULTS:
  - PIN_FLD_ACCOUNT_OBJ
  - PIN_FLD_BAL_IMPACTS array
  - PIN_FLD_CYCLE_INFO substruct

**PCM_OP_SUBSCRIPTION_PURCHASE_DISCOUNT**

**Changed Input Fields**
- PIN_FLD_DISCOUNTS array:
  - PIN_FLD_PURCHASE_START_T
  - PIN_FLD_PURCHASE_END_T
  - PIN_FLD_CYCLE_START_T
  - PIN_FLD_CYCLE_END_T
  - PIN_FLD_USAGE_START_T
  - PIN_FLD_USAGE_END_T

**Removals**
- PIN_FLD_USAGE_DISCOUNT in the PIN_FLD_DISCOUNTS array.

**New Output Fields**
- PIN_FLD_DISCOUNTS array

**PCM_OP_SUBSCRIPTION_PURCHASE_FEES**

**New Input Fields**
- PIN_FLD_FLAGS
- PIN_FLD_CURRENCY
- PIN_FLD_ON_DEMAND_INFO substruct

New output fields
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_BAL_IMPACTS array

**PCM_OP_SUBSCRIPTION_PURCHASE_PRODUCT**

Changed input fields
The following fields in PIN_FLD_PRODUCTS array are now mandatory:
- PIN_FLD_PURCHASE_START_T
- PIN_FLD_PURCHASE_END_T
- PIN_FLD_CYCLE_START_T
- PIN_FLD_CYCLE_END_T
- PIN_FLD_CYCLE_DISCOUNT
- PIN_FLD_USAGE_START_T
- PIN_FLD_USAGE_END_T
- PIN_FLD_USAGE_DISCOUNT

New output fields
- PIN_FLD_ACCOUNT_OBJ
- PIN_FLD_BAL_IMPACTS array
- PIN_FLD_CYCLE_INFO substruct

**PCM_OP_SUBSCRIPTION_SET_DISCOUNT_STATUS**

New output fields
- PIN_FLD_ACCOUNT_OBJ

Removed output fields
- PIN_FLD.Unknown [0]

**PCM_OP_SUBSCRIPTION_SET_DISCOUNTINFO**

New output fields
- PIN_FLD_ACCOUNT_OBJ

Removed output fields
- PIN_FLD.Unknown [0]

**PCM_OP_SUBSCRIPTION_SET_PRODINFO**

New input fields
- PIN_FLD_STATUS_FLAGS

New output fields
- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_SUBSCRIPTION_SET_PRODUCT_STATUS**

New output fields
- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_SUBSCRIPTION_SHARING_GROUP_CREATE**

New input fields

- PIN_FLD_PROGRAM_NAME
- PIN_FLD_BAL_GRP_OBJ

Removed input fields

- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_END_T
- PIN_FLD_SESSION_OBJ

**PCM_OP_SUBSCRIPTION_SHARING_GROUP_DELETE**

New input fields

- PIN_FLD_DESCR

Changed input fields

- PIN_FLD_OFFERING_OBJ in PIN_FLD_DISCOUNTS array is now optional.

Removed input fields

- PIN_FLD_SERVICE_OBJ
- PIN_FLD_SESSION_OBJ

**PCM_OP_SUBSCRIPTION_SHARING_GROUP_MODIFY**

New input fields

- PIN_FLD_DESCR

Removed input fields

- PIN_FLD_BAL_GRP_OBJ
- PIN_FLD_SESSION_OBJ

**PCM_OP_SUBSCRIPTION_SHARING_GROUP_SET_PARENT**

Removed input fields

- PIN_FLD_SESSION_OBJ
- PIN_FLD_END_T

**PCM_OP_SUBSCRIPTION_TRANSFER_ROLLOVER**

Changed input fields

- PIN_FLD_START_T and PIN_FLD_END_T are now optional.

**PCM_OP_SUBSCRIPTION_TRANSFER_SUBSCRIPTION**

New input fields

- PIN_FLD_START_T
- PIN_FLD_END_T
- PIN_FLD_EFFECTIVE_T in the PIN_FLD_BILLINFO array.
- PIN_FLD_PAYINFO array in the PIN_FLD_BILLINFO array:
- PIN_FLD_POID
- PIN_FLD_PAY_TYPE
- PIN_FLD_TYPE
- PIN_FLD_INV_TYPE
- PIN_FLD_PARENT
- PIN_FLD_CURRENCY
- PIN_FLD_PAYMENT_TERM

- PIN_FLD_SUBORD_INFO array in the PIN_FLD_INHERITED_INFO substruct in the PIN_FLD_PAYINFO array in the PIN_FLD_BILLINFO array.

**Changed input fields**

- PIN_FLD_PAYINFO was moved into PIN_FLD_BILLINFO array.
- The following fields in PIN_FLD_BILLINFO array are now optional:
  - PIN_FLD_POID
  - PIN_FLD_BILL_INFO_ID
  - PIN_FLD_PAYINFO_OBJ
  - PIN_FLD_PAY_TYPE
- PIN_FLD_INHERITED_INFO substruct in PIN_FLD_PAYINFO array in PIN_FLD_BILLINFO array is now mandatory.

**Removed input fields**

- PIN_FLD_PAYINFO array in the PIN_FLD_BILLINFO array.
- PIN_FLD_START_T
- PIN_FLD_END_T

**New output fields**

- PIN_FLD_ACCOUNT_OBJ

**PCM_OP_SUBSCRIPTION_TRANSITION DEAL**

**New input fields**

- PIN_FLD_DEAL_OBJ

**PCM_OP_SUBSCRIPTION_TRANSITION_PLAN**

**New input fields**

- PIN_FLD_DEAL_OBJ in the PIN_FLD_DEAL_INFO substruct.

**Changed input fields**

- PIN_FLD_PACKAGE_ID in the PIN_FLD_DEAL_INFO substruct is now optional.

**New output fields**

- PIN_FLD_RESULTS array:
  - PIN_FLD_POID
  - PIN_FLD_RESULTS array
PCM_OP_SUBSCRIPTION_VALIDATE_DISCOUNT_DEPENDENCY
Changed input fields
- PIN_FLD_PROGRAM_NAME is now optional.

Suspense FM Standard Opcodes
The following Suspense FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

PCM_OP_SUSPENSE_EDIT_USAGE
New input fields
- PIN_FLD_EDITS array:
  - PIN_FLD_OLD_VALUE
  - PIN_FLD_EXTENDED_INFO substruct
New output fields
- PIN_FLD_RESULT

PCM_OP_SUSPENSE_SEARCH_DELETE
New input fields
- PIN_FLD_UNKNOWN [0]
Changed output fields
- PIN_FLD_MIN_POID and PIN_FLD_MAX_POID are now optional.

PCM_OP_SUSPENSE_SEARCH_EDIT
Changed input fields
- PIN_FLD_FIELD_NAME and PIN_FLD_NEW_VALUE in the PIN_FLD_EDITS array are now optional.
Changed output fields
- PIN_FLD_POIDS array is now mandatory.
- PIN_FLD_MIN_POID and PIN_FLD_MAX_POID are now optional.

PCM_OP_SUSPENSE_SEARCH_RECYCLE
Changed input fields
- The following fields are now optional:
  - PIN_FLD_FLAGS
  - PIN_FLD_TEMPLATE
  - PIN_FLD_ARGS array
  - PIN_FLD_MODE
Changed output fields
- PIN_FLD_MIN_POID and PIN_FLD_MAX_POID are now optional.

PCM_OP_SUSPENSE_SEARCH_WRITE_OFF
Changed output fields
- PIN_FLD_MIN_POID and PIN_FLD_MAX_POID are now optional.

**PCM_OP_SUSPENSE_UNDO_EDIT_USAGE**

Changed output fields
- PIN_FLD_ACTION_OBJ is now optional.

**Services Framework AAA Manager FM Standard Opcodes**

The following Service Framework AAA Manager FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_TCF_AAA_ACCOUNTING**

New input fields
- PIN_FLD_TERMINATE_CAUSE

Removed input fields
- PIN_FLD_NETWORK_SESSION_CORRELATION_ID

**PCM_OP_TCF_AAA_ACCOUNTING_OFF**

New input field
- PIN_FLD_DELETED_FLAG

**PCM_OP_TCF_AAA_ACCOUNTING_ON**

New input fields
- PIN_FLD_DELETED_FLAG

**PCM_OP_TCF_AAA_AUTHORIZE**

Changed input fields
- PIN_FLD_PASSWORD is now PIN_FLD_PASSWD_CLEAR

Removed input fields
- PIN_FLD_ACTION

**PCM_OP_TCF_AAA_AUTHORIZE_PREP_INPUT**

New input fields
- PIN_FLD_TERMINATE_CAUSE

**PCM_OP_TCF_AAA_DETECT_CONTINUATION_CALL**

Changed input fields
- PIN_FLD_SERVICE_CODES array and PIN_FLD_TELCO_INFO substruct were moved to level 0.
- PIN_FLD_EVENT substruct in PIN_FLD_RATING_INFO substruct is now optional.

**Removed input fields**

- PIN_FLD_INHERITED_INFO substruct

**PCM_OP_TCF_AAA_REAUTHORIZE**

**New input fields**

- PIN_FLD_SESSION_TYPE

**PCM_OP_TCF_AAA_SEARCH_SESSION**

**New input fields**

- PIN_FLD_OPCODE

**PCM_OP_TCF_AAA_STOP_ACCOUNTING_PREP_INPUT**

**New input fields**

- PIN_FLD_DROPPED_CALL_TERMINATE_CAUSE_ARRAY array in the PIN_FLD_TELCO_INFO substruct.

**Changed input fields**

- PIN_FLD_OPCODE is now optional.

**PCM_OP_TCF_AAA_UPDATE_ACCOUNTING**

**New input fields**

- PIN_FLD_UNIT

**PCM_OP_TCF_AAA_UPDATE_ACCOUNTING_PREP_INPUT**

**New input fields**

- PIN_FLD_UNIT
- PIN_FLD_TERMINATE_CAUSE

**PCM_OP_TCF_PROV_CREATE_SVC_ORDER**

**Changed input fields**

- PIN_FLD_USERID is now of type STR
- PIN_FLD_SERVICE_OBJ is now mandatory.

**PCM_OP_TCF_PROV_HANDLE_SVC_ORDER**

**Changed input fields**

- PIN_FLD_USERID is now of type POID.

**PCM_OP_TCF_PROV_SERVICE_ORDER_NOTIFY**

**Changed input fields**

- PIN_FLD_PROGRAM_NAME is now optional.
- PIN_FLD_SVC_ORDER substruct is now mandatory.
- PIN_FLD_NEW_STATE_ID in PIN_FLD_SVC_ORDER substruct is now PIN_FLD_NEW_STATE.
■ PIN_FLD_USERID is now of type POID
■ PIN_FLD_END_T is now optional.

**PCM_OP_TCF_PROV_UPDATE_PROV_OBJECT**

**Changed input fields**

■ PIN_FLD_USERID is now of type POID.
■ PIN_FLD_SVC_ORDER substruct is now mandatory.

**PCM_OP_TCF_PROV_UPDATE_SVC_ORDER**

**New input field**

■ PIN_FLD_STATUS

---

**Voucher FM Standard Opcodes**

The following Voucher FM standard opcodes were changed between Portal 7.3 and BRM 7.3.1.

**PCM_OP_VOUCHER_ASSOCIATE_VOUCHER**

**New output fields**

■ PIN_FLD_DEVICE_VOUCHER substruct

**Changed output fields**

■ The following fields were moved into the PIN_FLD_BAL_IMPACTS array:
  - PIN_FLD_RESOURCE_ID
  - PIN_FLD_AMOUNT
  - PIN_FLD_VALID_FROM
  - PIN_FLD_VALID_TO

---

**Renamed Opcodes**

Table 11–1 shows the Telco Framework opcodes that were renamed in BRM 7.3.1.

<table>
<thead>
<tr>
<th>Old Opcode Name</th>
<th>New Opcode Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCM_OP_TELCO_APPLY_PARAMETER</td>
<td>PCM_OP_TCF_APPLY_PARAMETER</td>
</tr>
<tr>
<td>PCM_OP_TELCO_PROPAGATE_STATUS</td>
<td>PCM_OP_TCF_PROPAGATE_STATUS</td>
</tr>
<tr>
<td>PCM_OP_TELCO_SVC_LISTENER</td>
<td>PCM_OP_TCF_SVC_LISTENER</td>
</tr>
</tbody>
</table>
Pipeline Manager Changes from Portal 7.3 to BRM 7.3.1

This document provides upgrade impact information for Portal™ Release 7.3 to Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1. It describes the Pipeline Manager EDR changes that affect your Portal system and what you need to consider when you upgrade from 7.3 to 7.3.1.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

### Changed Pipeline Manager Modules

Table 12–1 describes the changed pipeline manager modules.

<table>
<thead>
<tr>
<th>Changed Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“DAT_AccountBatch”</td>
<td>This module has been enhanced to determine whether balance monitoring is enabled by using the <code>BalanceMonitoring</code> entry from the <code>multi_bal</code> parameter instance of the <code>/config/business_params</code> object rather than the Pipeline Manager registry’s <code>ReadBalanceGroupMonitors</code> entry. See “Using business parameter settings from the BRM database” in BRM System Administrator’s Guide.</td>
</tr>
<tr>
<td>“DAT_BalanceBatch”</td>
<td>This module has been enhanced to determine whether to restrict the validity end time of first-usage resources by using the <code>RestrictResourceValidityToOffer</code> entry from the <code>multi_bal</code> parameter instance of the <code>/config/business_params</code> object rather than the Pipeline Manager registry’s <code>RestrictResourceValidityToOffer</code> entry. See &quot;Using business parameter settings from the BRM database&quot; in BRM System Administrator’s Guide.</td>
</tr>
<tr>
<td>“DAT_Discount”</td>
<td>This module has been enhanced to determine the type of discount validity and exclusion rules to apply by using the <code>ValidateDiscountDependency</code> entry from the <code>billing</code> parameter instance of the <code>/config/business_params</code> object rather than the Pipeline Manager registry’s <code>SupportExclusion</code> entry. See &quot;Using business parameter settings from the BRM database&quot; in BRM System Administrator’s Guide.</td>
</tr>
<tr>
<td>“DAT_PortalConfig”</td>
<td>This module has been enhanced to retrieve business parameter settings from the BRM database’s <code>/config/business_params</code> object and store them in internal memory. You can print to a file all business parameter settings stored in DAT_PortalConfig’s memory by using the new <code>CBPPrintData</code> semaphore entry. See &quot;Using business parameter settings from the BRM database&quot; in BRM System Administrator’s Guide. Due to the dependency of other data modules on DAT_PortalConfig, the DAT_PortalConfig registry entries must now appear before all other data module entries in the registry file.</td>
</tr>
<tr>
<td>“FCT_PreSuspense”</td>
<td>This module has been enhanced to enable you to determine whether an EDR’s batch ID is preserved as it is processed by the pipeline. See “Tracking EDRs by using batch IDs” in BRM Collecting Revenue Assurance Data.</td>
</tr>
</tbody>
</table>
New EDR Container Fields

The following tables list the new BRM EDR container fields for the following entities:

- Basic Detail Record
- Associated Charge Breakdown Record - Update Balance Packet
- Associated Charge Breakdown Record - Supplementary Charge Packet Record
- Split Charge Packet

Basic Detail Record

Table 12–2 describes the basic detail record.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNRATED_QUANTITY</td>
<td>Decimal</td>
<td>Unrated quantity filled in after credit limit check.</td>
</tr>
<tr>
<td>RERATE_TAG</td>
<td>Integer</td>
<td>Used for re-rating</td>
</tr>
<tr>
<td>NET_QUANTITY</td>
<td>Decimal</td>
<td>Contains the summation of the BALANCE_PACKET.PIN_QUANTITY for the associated RUM.</td>
</tr>
</tbody>
</table>

Associated Charge Breakdown Record - Update Balance Packet

Table 12–3 describes the associated charge breakdown record - update balance packet.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTRIBUTOR</td>
<td>String</td>
<td>Balance group contributor.</td>
</tr>
<tr>
<td>GRANTOR</td>
<td>String</td>
<td>Balance group grantor.</td>
</tr>
<tr>
<td>GRANT_VALID_FROM</td>
<td>Date</td>
<td>Grant validity start time.</td>
</tr>
<tr>
<td>GRANT_VALID_TO</td>
<td>Date</td>
<td>Grant validity end time.</td>
</tr>
</tbody>
</table>

Associated Charge Breakdown Record - Supplementary Charge Packet Record

Table 12–4 describes the associated charge breakdown record - supplementary charge packet record.

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUANTITY_FROM</td>
<td>Decimal</td>
<td>Charge packet start quantity.</td>
</tr>
<tr>
<td>QUANTITY_TO</td>
<td>Decimal</td>
<td>Charge packet end quantity.</td>
</tr>
</tbody>
</table>

Split Charge Packet

This optional record can be used with the charge packet.

Table 12–5 describes the split charge packet.
Table 12–5  Split Charge Packet

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESOURCE_ID</td>
<td>Integer</td>
<td>Calculated Mandatory</td>
</tr>
<tr>
<td>RUM</td>
<td>String</td>
<td>Calculated Mandatory</td>
</tr>
<tr>
<td>QUANTITY_FROM</td>
<td>Decimal</td>
<td>Calculated Mandatory</td>
</tr>
<tr>
<td>QUANTITY_TO</td>
<td>Decimal</td>
<td>Calculated Mandatory</td>
</tr>
<tr>
<td>CHARGED_AMOUNT_VALUE</td>
<td>Decimal</td>
<td>Mandatory</td>
</tr>
<tr>
<td>INTERN_PACKET_INDEX</td>
<td>Integer</td>
<td>Added by discounting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Optional</td>
</tr>
<tr>
<td>INTERN_SRC_PACKET_INDEX</td>
<td>Integer</td>
<td>NA</td>
</tr>
</tbody>
</table>

Discount Sub-Balance Packet

Table 12–6 describes the basic detail record.

Table 12–6  Discount Sub-Balance Packet

<table>
<thead>
<tr>
<th>Name</th>
<th>Format</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRANT_VALID_FROM</td>
<td>Date</td>
<td>Grant validity start time.</td>
</tr>
<tr>
<td>GRANT_VALID_TO</td>
<td>Date</td>
<td>Grant validity end time.</td>
</tr>
</tbody>
</table>
Utility Changes from Portal 7.3 to BRM 7.3.1

This document provides upgrade impacts information for Portal™ Release 7.3 to Oracle Communications Billing and Revenue Management (BRM) Release 7.3.1. It describes the utility changes that affect your Portal system, and what you need to consider when you upgrade from 7.3 to 7.3.1.

For information on planning your upgrade implementation, such as setting up your development and test environments, see "About Upgrading BRM Releases".

Changed Utilities

Table 13–1 describes the changed utilities in BRM 7.3.1.

<table>
<thead>
<tr>
<th>Changed Utility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin_ledger_report</td>
<td>The create_journal mode is no longer supported in the pin_ledger_report utility. Instead, you create journal objects by using the new create_journal.pl script.</td>
</tr>
</tbody>
</table>

This part contains information on the upgrade procedures for different categories of BRM software.

Part III contains the following chapters:

- Upgrading from BRM 7.3.1 to BRM 7.4
- Upgrading from Portal 7.3 to BRM 7.4
- Upgrading from Portal 7.3 to BRM 7.3.1
- Upgrading from GPRS Manager Release 2.0 to Release 3.0
- Migrating Data to an Oracle In-Memory Database Cache-Enabled BRM System
Upgrading from BRM 7.3.1 to BRM 7.4

This document contains procedures for upgrading from Oracle Communications Billing and Revenue Management (BRM) 7.3.1 to BRM 7.4. It covers BRM on HP-UX IA64, Linux, AIX, and Solaris.

**Important:** Before performing this upgrade, see "About Upgrading BRM Releases" for information on how to plan, prepare for, and test your upgrade.

### Upgrade Patches

There is one overlay upgrade patch: 7594327. This overlay upgrade patch includes the changes that are necessary for upgrading BRM 7.3.1 to BRM 7.4. It upgrades the following components:

- 32-bit BRM
- BRM SDK
- 32-bit Third-Party software
- BRM SNMP
- Pipeline Manager
- Pipeline PDK
- TIMOS Data Manager

The upgrade identifies BRM components already installed in your environment and upgrades them to BRM 7.4.

Refer to the upgrade patch README for more information.

### 7.3.1-to-7.4 Upgrade

This section provides a list of upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

**Caution:** When upgrading a *multidatabase system*, pay close attention to the system on which each task is performed.
Table 14–1 identifies the system on which to perform the task at the beginning of each task.

**Table 14–1  System Identification**

<table>
<thead>
<tr>
<th>Primary Only</th>
<th>Secondary Only</th>
<th>Primary and Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Primary Only" /></td>
<td><img src="image2" alt="Secondary Only" /></td>
<td><img src="image3" alt="Primary and Secondary" /></td>
</tr>
</tbody>
</table>

Perform these tasks when upgrading your BRM system:

1. **Shutting Down the Current Instance.**
2. **Backing Up Files.**
3. **Turning Off BRM Service Authentication and Authorization.**
4. **Backing Up your BRM 7.3.1 Database.**
5. **Setting the Environment Variables.**
6. **Installing the Overlay Upgrade Patch.**
7. **Upgrading the BRM Database Schema**
8. **Upgrading the Pipeline Manager Database Schema**
9. **Installing the Overlay Upgrade Patch on a Multidatabase System.**
10. **Installing BRM 7.4 Client Applications.**
11. **Adding Customizations.**
12. **Restoring Service Authentication.**

### Shutting Down the Current Instance

Figure 14–1  Primary and Secondary

To shut down BRM 7.3.1:

1. **Stop all BRM 7.3.1 processes.**
   
   Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in *BRM System Administrator’s Guide*.

2. **Ensure that no users are logged in.**
   
   Users include customers, client applications, customer service representatives (CSRs), and so on.

### Backing Up Files

Figure 14–1  Primary and Secondary

To back up files:

1. **Stop all BRM 7.3.1 processes.**

2. **Ensure that no users are logged in.**

   Users include customers, client applications, customer service representatives (CSRs), and so on.
7.3.1-to-7.4 Upgrade

**Figure 14–2 Primary and Secondary**

Back up your BRM 7.3.1 files. In particular, make sure you back up all customized files, including source code, policy files, `pin.conf`, `pin_setup.values`, and `Infranet.properties` files. Copy your customizations from these files to the BRM 7.4 files after upgrading to BRM 7.4.

---

**Important:** Back up all the customized load utility files to a different location. After the upgrade is completed and services start running, restore the customized load utility files to their original location. Run the load utility applications to restore the customized entries in the database.

---

For more information, see "Transferring Customizations to the New Release".

### Turning Off BRM Service Authentication and Authorization

**Figure 14–3 Primary and Secondary**

To maintain a controlled environment for pre-upgrade testing, cut off interaction between your BRM system and your customers.

For information on providing access to services while authentication is turned off, see "Maintaining Access to Services While Upgrading".

For information on the BRM authentication module, see “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

### Backing Up your BRM 7.3.1 Database

**Figure 14–4 Primary and Secondary**

Make a complete offline backup of your BRM 7.3.1 database and ensure that the backup is completely valid and usable. See your database software documentation for more information on performing full database backups.

In addition to the backup, use the Oracle export utility to export all BRM 7.3.1 tables. This helps to restore individual tables, if necessary.

### Setting the Environment Variables

Before installing the upgrade, ensure the environment variables are set correctly:

1. Go to the directory where you installed the Third-Party package.
2. Initialize the source.me script:
   Bash shell:
   %% source source.me.sh
   
   C shell:
   %% source source.me.csh

Installing the Overlay Upgrade Patch

To install the overlay upgrade patch:

1. Download patch 7594327 from the Oracle MetaLink Web site
   (https://metalink.oracle.com) to a temporary directory (temp_dir) on your
   system.
2. Go to temp_dir and install the patch 7594327 package by entering the package
   name. Use this syntax:
   %% PatchPackageName.bin

   where PatchPackageName is:

   - 7.4_7594327_Portal_Base_platform_32_opt for upgrading BRM plus any BRM
      optional components installed on your system.
   - 7.4_7594327_Portal_SDK_platform_32_opt for upgrading the BRM SDK.
   - 7.4_7594327_ThirdParty_Upgrade_platform_32_opt for upgrading Third-Party
      software (this will install the RDA tool). For more information, see “Collecting
      Diagnostic Information by Using RDA” in BRM System Administrator’s Guide.
   - 7.4_7594327_SNMP_3rd_party_tool_platform_64_opt for upgrading BRM
      SNMP.
   - 7.4_7594327_Pipeline_platform_64_opt for upgrading Pipeline Manager.
   - 7.4_7594327_Pipeline_PDK_platform_64_opt for upgrading the Pipeline PDK.
   - 7.4_7594327_Timos_platform_64_opt for upgrading TIMOS Data Manager.

   where platform is hpux_i64, solaris, linux, or aix.

---

**Note:** You can use the -console parameter to run the installation from a command line. To install using a GUI, obtain a GUI
application, such as X Windows, and set the DISPLAY environment
variable before you install BRM 7.4.

---

Upgrading the BRM Database Schema

**7.3.1-to-7.4 Upgrade**

**Figure 14–5  Primary and Secondary**

---

**Important:** First run the database upgrade script on the secondary databases and then on the primary database.
The `pin_731_74_upgrade.pl` script runs a series of scripts that upgrade BRM 7.3.1 to BRM 7.4.

To upgrade your BRM database schema:

1. Open the `BRM_Home/setup/pin_setup.values` file.
2. (Optional) Set the values of the following parameters:
   - `PIN_TEMP_DIR` to the directory in which you want to create the temporary files.
   - `PIN_LOG_DIR` to the directory in which you want to create the BRM log files.
3. In the **Information about the databases** section, configure the database settings as required.
4. Save and close the file.
5. Run the `pin_731_74_upgrade.pl` script from the UNIX prompt:

   ```
   cd BRM_Home/setup/scripts
   perl pin_731_74_upgrade.pl
   ```

### Upgrading the Pipeline Manager Database Schema

**7.3.1-to-7.4 Upgrade**

*Figure 14–6  Primary and Secondary*

**Important:** First run the database upgrade script on the secondary databases and then on the primary database.

To upgrade the Pipeline Manager database schema:

1. Open the `IFW_Home/upgrade/pin_setup.values` file.
2. Set the value of the `PIN_TEMP_DIR` parameter to the directory in which you want to create the temporary files.
3. Point `$PIPELINE_TBLSPACE` to the tablespace where you want to create pipeline database objects.
4. In the **Information about the databases** section, configure the database settings as required.
5. Save and close the file.
6. Run the `pin_731_74_pipeline_upgrade.pl` script from the UNIX prompt:

   ```
   cd Pipeline_Home/upgrade/731_74
   perl pin_731_74_pipeline_upgrade.pl
   ```
7. Update the AccessLib registry entry from oci10g61 to oci10g63 for Login, LoginInfranet, and LoginQueue modules. This includes files such as wireless.reg, rerating.reg, roaming.reg, and other registry files located in Pipeline_Home/conf directory.

Installing the Overlay Upgrade Patch on a Multidatabase System

7.3.1-to-7.4 Upgrade

Figure 14–7  Primary and Secondary

---

**Important**: First install the overlay upgrade patch on the secondary database and then on the primary database.

---

1. Go to BRM_Home/setup/pin_setup.values file.
2. Change the \$DM_ORACLE\{db_num\} entry, where db_num is the number of the secondary database to upgrade.
3. Save and close the file.
4. Run the pin_731_74_upgrade.pl script from the UNIX prompt:
   
   ```bash
   % cd BRM_Home/setup/scripts
   % perl pin_731_74_upgrade.pl
   ```

Installing BRM 7.4 Client Applications

7.3.1-to-7.4 Upgrade

Figure 14–8  Primary and Secondary

---

When you install client applications, be sure to update the BRM 7.4 Infranet.properties and INI files with any 7.3.1 customizations.

---

**Important**: You must upgrade all client applications and optional components to BRM 7.4.

---

To upgrade custom client applications, recompile them with BRM 7.4 libraries. See "Updating Custom Applications" for more information.

Adding Customizations

7.3.1-to-7.4 Upgrade
Important: You must first incorporate customizations on the secondary databases and then on the primary database.

Incorporate any customizations you made to your Release 7.3.1 policy source code, configuration files, invoicing, reports, and general ledger reporting. See “Transferring Customizations to the New Release” for more information.

(Production system only) Make sure you remove all entries for the `pin_virtual_time` utility from the configuration files.

Restoring Service Authentication
7.3.1-to-7.4 Upgrade

See “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.

Post Upgrade Procedures

This section provides a list of post-upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

Perform these tasks after you upgrade your BRM system:

1. Creating an Oracle AQ Database Queue
2. Loading `pin_notify`
3. Removing the `xml.jar` File (AIX Only)

Creating an Oracle AQ Database Queue
7.3.1-to-7.4 Upgrade

If your system includes the Synchronization Queue Data Manager, you must recreate your Oracle AQ database queue before you can begin synchronizing pricing data. For more information on how to create a database queue, see “Manually Creating a Database Queue on Oracle” in BRM Synchronization Queue Manager.

After you re-create the Oracle AQ database queue, perform these steps:

1. Update `BRM_Home/sys/dm_aq/aq_queue_names` with the recreated Oracle AQ database queue name.
Uninstalling an Upgrade Package

2. Restart DM_AQ services.

Loading pin_notify

7.3.1-to-7.4 Upgrade

Figure 14–12 Primary and Secondary

If your system includes Pipeline Manager, you must reload the event notification configuration file, **pin_notify**, in the BRM database. For more information, see “About the Event Notification List” in *BRM Developer’s Guide*.

To load the **pin_notify** file:

1. Go to the `BRM_Home/sys/data/config` directory.
2. Use the following command to run the **load_pin_notify** utility:

   ```
   load_pin_notify pin_notify
   ```

   If you do not run the utility from the directory in which the configuration file is located, include the complete path to the file.
3. Stop and restart the Connection Manager (CM).

Removing the xml.jar File (AIX Only)

7.3.1-to-7.4 Upgrade

Figure 14–13 Primary and Secondary

For AIX only, you must remove or rename the **xml.jar** file from the JRE bundle to avoid a conflict with a Third-Party package.

To remove or rename the **xml.jar** file:

1. Go to the `BRM_Home/opt/portal/7.4/ThirdPartyApps/jre/1.5.0/lib` directory.
2. Remove or rename the **xml.jar** file.

Uninstalling an Upgrade Package

To uninstall any upgrade package:

1. Back up the BRM database.
2. Back up all the BRM files.
3. Stop all BRM daemons, processes, and managers.
4. Log in as user **pin**.
5. Go to the directory where you installed the Third-Party package and source the **source.me** file:

   ```
   Bash shell:
   ```
Uninstalling an Upgrade Package

% source source.me.sh

C shell:
% source source.me.csh

6. Run the `BRM_Home/uninstaller/PatchPackageName/uninstaller.bin` program, where `PatchPackageName` is the name of the upgrade package you want to uninstall.

   **Note:** You can use the `-console` parameter to run uninstall from a command line.

   This starts a series of interactive prompts.

7. Follow the instructions on the screen.
This document contains procedures for upgrading from Portal release 7.3 to Oracle Communications Billing and Revenue Management (BRM) 7.4. It covers BRM on HP-UX IA64 and Solaris.

**Important:** Before performing this upgrade see "About Upgrading BRM Releases" for information on how to plan, prepare for, and test your upgrade.

### Upgrade Patches

There is one overlay upgrade patch: 7594320. This overlay upgrade patch includes the changes that are necessary for upgrading Portal 7.3 to BRM 7.4. It upgrades the following components:

- 32-bit Portal Base
- Portal SDK
- 32-bit Third-Party software
- SNMP
- Pipeline Manager
- Pipeline PDK
- TIMOS Data Manager

The upgrade identifies Portal components already installed in your environment and upgrades them to BRM 7.4.

Refer to the upgrade patch README for more information.

### 7.3-to-7.4 Upgrade

This section lists the upgrade tasks.

**Caution:** When upgrading a multibase database system, pay close attention to the system on which each task is performed.

Table 15–1 identifies the system on which you should perform the task at the beginning of each task.
Table 15–1  System Identification

<table>
<thead>
<tr>
<th>Primary Only</th>
<th>Secondary Only</th>
<th>Primary and Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>![P]</td>
<td>![S]</td>
<td>![D]</td>
</tr>
</tbody>
</table>

Perform these tasks when upgrading your BRM system:

1. Shutting Down the Current Instance.
2. Backing Up Files.
4. Backing Up Your Portal 7.3 Database.
5. Installing Portal 7.3 Patches.
7. Installing the Overlay Upgrade Patch.
8. Upgrading the Portal Database Schema
9. Upgrading the Pipeline Manager Database Schema
10. Installing the Overlay Upgrade Patch on a Multidatabase System.
11. Installing BRM 7.4 Client Applications.
12. Adding Customizations.

Shutting Down the Current Instance

7.3-to-7.4 Upgrade

Figure 15–1  Primary and Secondary

![D]

To shut down Portal 7.3:

1. Stop all Portal 7.3 processes.
   
   Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in BRM System Administrator’s Guide.

2. Ensure that no users are logged in.
   
   Users include customers, client applications, customer service representatives (CSRs), and so on.

Backing Up Files

7.3-to-7.4 Upgrade
Figure 15–2 Primary and Secondary

Back up your Portal 7.3 files. In particular, make sure you back up all customized files, including source code, policy files, `pin.conf`, `pin_setup.values`, and `Infranet.properties` files. Copy your customizations from these files to the BRM 7.4 files after upgrading to BRM 7.4.

**Important:** Back up all the customized load utility files to a different location. After the upgrade is completed and services start running, restore the customized load utility files to their original location. Run the load utility applications to restore the customized entries in the database.

For more information, see "Transferring Customizations to the New Release".

Turning Off Portal Service Authentication and Authorization

Figure 15–3 Primary and Secondary

To maintain a controlled environment for pre-upgrade testing, cut off interaction between your Portal system and your customers.

For information on providing access to services while authentication is turned off, see "Maintaining Access to Services While Upgrading".

For information on the BRM authentication module, see “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

Backing Up Your Portal 7.3 Database

Figure 15–4 Primary and Secondary

Make a complete offline backup of your Portal 7.3 database and ensure that the backup is completely valid and usable. See your database software documentation for more information on performing full database backups.

In addition to the backup, use the Oracle export utility to export all Portal 7.3 tables. This helps to restore individual tables, if necessary.

Installing Portal 7.3 Patches

Figure 15–4 Primary and Secondary

...
Download and install the mandatory Portal 7.3 patches 5835756 (04489), 5903622, and 6787882 for your platform. These patches are available from the Portal 7.3 patch page on the Oracle MetaLink Web site (https://metalink.oracle.com). Follow the installation instructions in the README downloaded with the patches.

Setting the Environment Variables
Before installing the overlay upgrade patch, ensure the environment variables are set correctly:

1. Go to the directory where you installed the Third-Party package.
2. Initialize the `source.me` script:
   - Bash shell:
     
     ```bash
     % source source.me.sh
     ```
   - C shell:
     
     ```csh
     % source source.me.csh
     ```

Installing the Overlay Upgrade Patch
To install the overlay upgrade patch:

1. Download patch 7594320 from the Oracle MetaLink Web site to a temporary directory (`temp_dir`) on your system.
2. Go to `temp_dir` and install the patch. Use this syntax:

   ```bash
   % PatchPackageName.bin
   ```

where `PatchPackageName` is:

- **7.4_7594320_Portal_Base_platform_32_opt** for upgrading Portal plus any Portal optional components installed on your system.
- **7.4_7594320_Portal_SDK_platform_32_opt** for upgrading the Portal SDK.
- **7.4_7594320_ThirdParty_Upgrade_platform_32_opt** for upgrading the Third-Party software (this will install the RDA tool and upgrade JRE to 1.5.0_09-b03). For more information, see “Collecting Diagnostic Information by Using RDA” in *BRM System Administrator’s Guide*.
- **7.4_7594320_SNMP_3rd_party_tool_platform_64_opt** for upgrading SNMP.
- **7.4_7594320_Pipeline_platform_64_opt** for upgrading Pipeline Manager.
- **7.4_7594320_Pipeline_PDK_platform_64_opt** for upgrading the Pipeline PDK.
- **7.4_7594320_Timos_platform_64_opt** for upgrading TIMOS Data Manager.

where `platform` is `hpux_ia64` or `solaris`. 
**Note:** You can use the `-console` parameter to run the installation from a command line. To install using a GUI, obtain a GUI application, such as X Windows, and set the DISPLAY environment variable before you install BRM 7.4.

---

**Upgrading the Portal Database Schema**

**7.3-to-7.4 Upgrade**

*Figure 15–6  Primary and Secondary*

---

**Important:** First run the database upgrade script on the secondary databases and then on the primary database.

---

**Note:** If your base system has TIMOS DM installed, before running the upgrade script, you must install the TIMOS DM upgrade package (7.4_7594320_Timos_platform_64_opt, where platform is `hpux_ia64` or `solaris`).

The `pin_73patch_74_upgrade.pl` script runs a series of scripts that upgrade Portal 7.3 to BRM 7.4.

To upgrade your Portal database schema:

1. Open the `BRM_Home/setup/pin_setup.values` file.
2. (Optional) Set the values of the following parameters:
   - PIN_TEMP_DIR to the directory in which you want to create the temporary files.
   - PIN_LOG_DIR to the directory in which you want to create the BRM log files.
3. In the **Information about the databases** section, configure the database settings as required.
4. Save and close the file.
5. Run the `pin_73patch_74_upgrade.pl` script from the UNIX prompt:

```bash
$ cd BRM_Home/setup/scripts
$ perl pin_73patch_74_upgrade.pl
```

**Note:** When you upgrade from Portal 7.3 to BRM 7.4, the `dd_objects.source` file adds additional columns in the `EVENT_PRODUCT_FEE_CYCLE_T` database table. Ignore these additional columns in the table. These columns are not used.

---

**Upgrading the Pipeline Manager Database Schema**

**7.3-to-7.4 Upgrade**

---

**Note:** You can use the `-console` parameter to run the installation from a command line. To install using a GUI, obtain a GUI application, such as X Windows, and set the DISPLAY environment variable before you install BRM 7.4.
To upgrade your Pipeline Manager database schema:

1. Open the `IFW_Home/upgrade/pin_setup.values` file.
2. Set the value of the PIN_TEMP_DIR parameter to the directory in which you want to create the temporary files.
3. Point `$PIPELINE_TBLSPACE` to the tablespace where you want to create pipeline database objects.
4. In the Information about the databases section, configure the database settings as required.
5. Save and close the file.
6. Run the `pin_731_74_pipeline_upgrade.pl` script from the UNIX prompt:
   ```bash
   pin_731_74_pipeline_upgrade.pl
   cd Pipeline_Home/upgrade/731_74
   perl pin_731_74_pipeline_upgrade.pl
   ```
7. Update the AccessLib registry entry from `oci10g61` to `oci10g63` for Login, LoginInfranet, and LoginQueue modules. This includes files such as `wireless.reg`, `rerating.reg`, `roaming.reg`, and other registry files located in the `Pipeline_Home/conf` directory.

Installing the Overlay Upgrade Patch on a Multidatabase System

1. Open the `BRM_Home/setup/pin_setup.values` file.
2. Change the `$DM_ORACLE ['db_num']` entry, where `db_num` is the number of the secondary database to upgrade.
3. Save and close the file.
4. Run the `pin_73patch_74_upgrade.pl` script from the UNIX prompt:
   ```bash
   cd BRM_Home/setup/scripts
   perl pin_73patch_74_upgrade.pl
   ```
Installing BRM 7.4 Client Applications

7.3-to-7.4 Upgrade

Figure 15-9  Primary and Secondary

When you install client applications, be sure to update the BRM 7.4 *Infranet.properties* and INI files with any 7.3 customizations.

---

**Important:** You must upgrade all client applications and optional components to BRM 7.4.

---

To upgrade custom client applications, recompile them with BRM 7.4 libraries. For more information, see "Updating Custom Applications".

Adding Customizations

7.3-to-7.4 Upgrade

Figure 15-10  Primary and Secondary

---

**Important:** First incorporate customizations on the secondary databases and then on the primary database.

---

Incorporate any customizations you made to your Portal 7.3 policy source code, configuration files, invoicing, reports, and general ledger reporting. For more information, see "Transferring Customizations to the New Release".

(Production system only) Make sure you remove all entries for the *pin_virtual_time* utility from the configuration files.

Restoring Service Authentication

7.3-to-7.4 Upgrade

Figure 15-11  Primary and Secondary

---

See “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

Post Upgrade Procedure

This section includes a post-upgrade task. Be sure to check whether this task is required for your system.
### Loading pin_notify

7.3-to-7.4 Upgrade

Figure 15–12  Primary and Secondary

If your system includes Pipeline Manager, reload the event notification configuration file, **pin_notify**, in the BRM database. For more information, see “About the Event Notification List” in *BRM Developer’s Guide*.

To load the **pin_notify** file:

1. Go to the `BRM_Home/sys/data/config` directory.
2. Use the following command to run the **load_pin_notify** utility:
   ```bash
   load_pin_notify pin_notify
   ```
   If you do not run the utility from the directory in which the configuration file is located, include the complete path to the file.
3. Stop and restart the Connection Manager (CM).

### Uninstalling an Upgrade Package

To uninstall any upgrade package:

1. Back up the BRM database.
2. Back up all the BRM files.
3. Stop all BRM daemons, processes, and managers.
4. Log in as user **pin**.
5. Go to the directory where you installed the Third-Party package and source the **source.me** file:
   ```bash
   Bash shell:
   % source source.me.sh
   
   C shell:
   % source source.me.csh
   ```
6. Run the `BRM_Home/uninstaller/PatchPackageName/uninstaller.bin` program, where *PatchPackageName* is the name of the upgrade package you want to uninstall.

   **Note:** You can use the `-console` parameter to run uninstall from a command line.

   This starts a series of interactive prompts.
7. Follow the instructions on the screen.
Note: Uninstalling the Third-Party upgrade package does not uninstall JRE 1.5.0_09-b03 that is the latest version recommended for BRM 7.4.
This document contains procedures for upgrading from Portal release 7.3 to Oracle Communications Billing and Revenue Management (BRM) 7.3.1. It covers BRM on UNIX (HP-UX and Solaris) and Windows platforms.

**Important:** Before performing this upgrade see the BRM 7.3.1 upgrade documentation for information on how to plan, prepare for, and test your upgrade.

If you are installing BRM for the first time, see the BRM 7.3.1 installation documentation.

For uninstall information, see "Uninstalling Portal 7.3 Applications".

**Upgrade Patches**

There are two prerequisite 7.3 patches, 5835756 and 5903622, and the 7.3.1 upgrade patch itself, 6498580. Download these patches from the Oracle MetaLink Web site to a temporary directory on your system.

The 7.3.1 upgrade patch, 6498580, installs five components: 32-bit_Portal_Base, Portal_SDK, Pipeline, Pipeline_TDK, and TIMOS. The installer identifies Portal components already installed in your environment and upgrades them to the BRM 7.3.1 release. During installation, you will be prompted to designate directories for the 32-bit_Portal_Base and Portal_SDK components.

Please refer to the README file with the patch for a list of files affected.

**7.3-to-7.3.1 Upgrade**

This section provides a list of upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

Unless otherwise noted, all steps apply to a single-database system.

**Caution:** When upgrading a *multidatabase system*, pay close attention to the system on which each task is performed.

Table 16–1 identifies the system on which you should perform the following tasks.
Table 16–1  System Identification

<table>
<thead>
<tr>
<th>Primary Only</th>
<th>Secondary Only</th>
<th>Primary and Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>![P]</td>
<td>![S]</td>
<td>![组合图]</td>
</tr>
</tbody>
</table>

Perform these tasks when upgrading your BRM system:

1. Shutting Down the Current Instance.
2. Backing Up Files.
4. Backing Up Your Portal 7.3 Database.
5. Installing Portal 7.3 Patches 5835756 and 5903622.
6. Installing the JDK.
7. (UNIX Only) Setting the Environment Variables.
8. Installing Upgrade Patch 6498580.
9. Running the Database Upgrade Script.
10. Installing the Upgrade Patch on a Multidatabase System.
11. Installing BRM 7.3.1 Client Applications.
12. Adding Customizations.

Shutting Down the Current Instance

To shut down Portal 7.3:

1. Stop all Portal 7.3 processes.
   
   Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in *BRM System Administrator’s Guide*.

2. Ensure that no users are logged on.
   
   Users include customers, client applications, customer service representatives (CSRs), and so on.

Backing Up Files

Before installing the current patch package, back up your Portal 7.3 files. In particular, make sure you back up all customized files, including source code, policy files, `pin.conf`, `pin_setup.values`, and `Infranet.properties` files. Copy your customizations from these files to the BRM 7.3.1 files after installing BRM 7.3.1.

For more information, see “Transferring Customizations to the New Release”.

**Turning Off Portal Service Authentication and Authorization**

To maintain a controlled environment for pre-upgrade testing, cut off interaction between your BRM system and your customers.

For information on providing access to services while authentication is turned off, see “Maintaining Access to Services While Upgrading”.

For information on the BRM authentication module, see “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

**Backing Up Your Portal 7.3 Database**

Make a complete offline backup of your Portal 7.3 database and ensure that the backup is completely valid and usable. See your database software documentation for more information on performing full database backups.

In addition to the backup, use the Oracle export utility to export all Portal 7.3 tables. This helps to restore individual tables, if necessary.

**Installing Portal 7.3 Patches 5835756 and 5903622**

Download and install Portal 7.3 patches 5835756 and 5903622 for your platform, if you have not already done so. These patches are available from the Portal 7.3 patch page on the Oracle MetaLink Web site. Follow the installation instructions in the README file downloaded with the patches.
Installing the JDK

To install the JDK, perform these steps:

1. Rename the ThirdParty directory; for example, for UNIX:
   /opt/portal/7.3/ThirdPartyApps to /opt/portal/7.3/ThirdPartyAppsOld.
   - Windows: The default installation path is:
     C:\Program Files\Common Files\Portal Software\ThirdParty
   - UNIX: The default installation path is:
     /opt/portal/ThirdParty

2. Install the BRM 7.3.1 Third-Party package in the default location.

(UNIX Only) Setting the Environment Variables

Before installing the upgrade patches, ensure the environment variables are set correctly:

1. Go to the directory where you installed the Third-Party package.

2. Initialize the source.me script:
   - Bash shell:
     ```
     % source source.me.sh
     ```
   - C shell:
     ```
     % source source.me.csh
     ```

Installing Upgrade Patch 6498580

Ensure that you install RPM packages in the correct numeric sequence.

Installing Patches in a Conventional (ISMP) Environment

To install the upgrade patch in an ISMP environment, perform these steps:

1. Download patch 6498580 from the Oracle MetaLink Web site to a temporary directory (temp_dir) on your system.

2. Go to temp_dir and install the patch package by entering the package name. Use this syntax:
   ```
   % PatchPackageName.bin
   ```

where PatchPackageName is:

- 7.3.1_6498580_Portal_Base_platform_32_opt for upgrading Portal base plus any Portal optional components installed on your system.
- 7.3.1_6498580_PCM_SDK_platform_32_dbg for upgrading PCM SDK.
- 7.3.1_6498580_Portal_SDK_platform_32_dbg for upgrading BRM SDK.
- 7.3.1_6498580_Pipeline_platform_64_opt for upgrading Pipeline Manager.
- 7.3.1_6498580_Timos_platform_64_opt for upgrading TIMOS Data Manager.
Note: You can use the -console parameter to run the installation from a command line. To install using a GUI, obtain a GUI application, such as X Windows, and set the DISPLAY environment variable before you install BRM 7.3.1.

3. If you upgraded both Portal base and Resource Reservation Manager from 7.3 to 7.3.1, you must reorganize the entries in your Connection Manager (CM) pin.conf file. You must move the fm_reserve_pol entry to just after the fm_reserve entry, as shown below:

- cm fm_module BRM_Home/lib/fm_reserve.so fm_utils_config fm_utils_init pin
- cm fm_module BRM_Home/lib/fm_reserve_pol.so fm_reserve_pol_config - pin

4. If you upgraded from Portal SDK 7.3 to BRM SDK 7.3.1, you must manually remove the Portal_Home/source/sys/fm_gprs_pol directory and its contents from your system. The files in this directory are for GPRS Manager 2.0, which was obsoleted in Portal 7.3. This directory was incorrectly created during the Portal SDK 7.3 installation and can cause compilation errors in BRM SDK 7.3.1.

Installing Patches in a Prepaid (RPM) Environment

To install the patches in a RPM environment, perform these steps:

1. Download patch 6498580 from the Oracle MetaLink Web site to a temporary directory (temp_dir) on your system.

2. Merge the patch RPM files with their corresponding Portal packages. Use this syntax for each merge:

   % PSC_Home/tools/pin_repackage.sh AbsolutePath/PortalPackageName.rpm AbsolutePath/PatchPackageName.rpm >>& pin_repackage.log

   where PortalPackageName is the file name for the original 7.3 package, and PatchPackageName is the name of the 7.3.1 patch package.

   - Patch_Portal_Base-7.3-1.6498580.platform for upgrading Portal base plus any Portal optional components installed on your system.
   - Patch_Pipeline-7.3-1.6498580.platform for upgrading Pipeline Manager.
   - Patch_Timos-7.3-1.6498580.platform for upgrading TIMOS Data Manager.

   Each new merged package will have the same name as the Portal package, except for the version numbers. The first part of the new package version number is incremented by one, and the second part of the version number is taken from the patch package. For example, if you merge Portal_Base-7.3-11.1234.sparc64.rpm with Patch_Portal_Base-7.3-1.6498580.sparc64.rpm, the resulting merged package name is Portal_Base-7.3-12.6498580.sparc64.rpm.

3. Move the merged packages to the BRM_Home repository:

   % mv MergedRPMFile BRM_Home/webapps/repository

4. Run the createrepo command:

   % BRM_Home/webapps/repository/createrepo `pwd`

5. If you upgraded both Portal and Resource Reservation Manager from 7.3 to 7.3.1, you must reorder the entries in your Connection Manager (CM) pin.conf file. You
must move the `fm_reserve_pol` entry to just after the `fm_reserve` entry, as shown below:

- `cm fm_module BRM_Home/lib/fm_reserve.so fm_utils_config fm_utils_init pin`
- `cm fm_module BRM_Home/lib/fm_reserve_pol.so fm_reserve_pol_config - pin`

Running the Database Upgrade Script

*7.3-to-7.3.1 Upgrade*

**Figure 16–6 Primary and Secondary**

---

**Important:** First run the database upgrade script on the secondary databases and then on the primary database.

---

The `pin_73patch_731_upgrade.pl` script runs a series of scripts that upgrade the Release 7.3 database to BRM 7.3.1.

To upgrade your database schema:

- Run the `pin_73patch_731_upgrade.pl` script from the UNIX or DOS prompt:
  
  ```
  % cd BRM_Home/setup/scripts
  % perl pin_73patch_731_upgrade.pl
  ```

Installing the Upgrade Patch on a Multidatabase System

Update secondary databases using the same procedure as the primary database:

1. Go to `BRM_Home/setup`.
2. Open the `pin_setup.values` file.
3. Find the `$DM_ORACLE{'db_num'}` entry.
4. Change `db_num` to the number of the secondary database to upgrade.
5. Run the `pin_73patch_731_upgrade.pl` script from the UNIX or DOS prompt:
   
   ```
   % cd BRM_Home/setup/scripts
   % perl pin_73patch_731_upgrade.pl
   ```

Installing BRM 7.3.1 Client Applications

*7.3-to-7.3.1 Upgrade*

**Figure 16–7 Primary and Secondary**

When you install client applications, be sure to update the BRM 7.3.1 `Infranet.properties` and INI files with any 7.3 customizations.

---

**Important:** You must upgrade all client applications and optional components to BRM 7.3.1.
Upgrading Custom Client Applications
To upgrade custom client applications, recompile them with BRM 7.3.1 libraries. For more information, see "Updating Custom Applications".

Adding Customizations
7.3-to-7.3.1 Upgrade

Figure 16–8 Primary and Secondary

**Important:** You must first incorporate customizations on the secondary databases and then on the primary database.

Incorporate any customizations you made to your Release 7.3.1 policy source code, configuration files, invoicing, reports, and general ledger reporting. For more information, see "Transferring Customizations to the New Release".

(Production system only) Make sure you remove all entries for the `pin_virtual_time` utility from the configuration files.

Restoring Service Authentication
7.3-to-7.3.1 Upgrade

Figure 16–9 Primary and Secondary

See “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.

Testing the Upgraded System
7.3-to-7.3.1 Upgrade

Figure 16–10 Primary and Secondary

Test your upgraded system by running various daily operations on it. Tests include running the “after” version of the reports you ran before beginning the upgrade. For more information, see "Testing Your Upgraded System".

Uninstalling Portal 7.3 Applications
To uninstall any Portal 7.3 application:

1. Go to the uninstaller directory located in the default installation directory (Portal_Home or IFW_Home):
   - Windows: C:\Portal
Uninstalling Portal 7.3 Applications

2. Run the uninstaller
   - (Windows) `uninstaller.exe`
   - (UNIX) `uninstaller.bin` with the following options:
     `uninstaller.bin -is:/javahome /Renamed73ThirdPartyLocation/jre`

(UNIX) To set up the default JRE to run the uninstaller, use the following command:

- C shell:
  `Portal_Home/ThirdPartyApps/source.me.csh`

- Bash shell:
  `Portal_Home/ThirdPartyApps/source.me.sh`
Upgrading from GPRS Manager Release 2.0 to Release 3.0

This document contains procedures for upgrading your GPRS Manager system directly from Release 2.0 to Release 3.0. It covers Oracle on UNIX (HP-UX and Solaris) platform.

About Upgrading GPRS Manager

- Install new GPRS Manager software.
- Update the GPRS Manager database. The new GPRS Manager release includes an updated database schema with new tables and indexes. You use upgrade scripts to update your GPRS Manager database to the new schema.
- The GPRS Manager 3.0 API is not backward compatible. You must implement a wrapper opcode to parse the existing flist data to the new API format.

Important Information for System Administrators

- GPRS Manager 3.0 runs only on the Oracle 9i or 10g database.
- To upgrade any data stored in custom tables, you must create additional SQL scripts. To run these scripts with the default upgrade scripts, add appropriate SQL file entries to the upgrade configuration file, upgrade.cfg. For more information, see "Configuring the Upgrade Parameters".

Oracle Database Character Sets

Portal supports only the UTF8 character set on Oracle. If you haven’t already done so, you should move your data to a new UTF8 database before you upgrade. For more information about exporting your existing data to a UTF8 database, see “Modifying your Oracle Database Installation” in BRM Installation Guide.

Preparing Your Environment for the Upgrade

After preparing your environment, prepare your database:

- Reviewing the Default Database Schema
- Preparing an Oracle Database
Reviewing the Default Database Schema
Before running the database upgrade scripts, review the default database schema changes between Release 2.0 and Release 3.0. Knowing the schema changes helps you plan your upgrade. For example, if 3.0 contains many new tables, you might need to increase the disk space for your 3.0 database. If your 2.0 custom applications refer to tables that have been modified or deleted in 3.0, you might need to update the applications for 3.0.

To review database schema changes, temporarily install the Release 3.0 database upgrade files on a supplementary server.

In addition, perform the database-specific tasks described in the section “Preparing an Oracle Database”.

Preparing an Oracle Database
If you use an Oracle database, perform the following tasks before upgrading Portal:

- Upgrading the Oracle Software and Database
- Changing the Database Character Set to UTF8
- Configuring Oracle to Run the Upgrade Scripts

Upgrading the Oracle Software and Database
You can use GPRS Manager 3.0 only on Oracle 9i or 10g.

---

Caution: If you are using an earlier version of Oracle, you must upgrade it before you install GPRS Manager 3.0. For information on upgrading Oracle, see your Oracle documentation.

---

Changing the Database Character Set to UTF8
GPRS Manager 3.0 supports only the UTF8 character set. If your database character set is not UTF8, re-create your database with the UTF8 database character set.

For information on changing the database character set, see your Oracle documentation.

Configuring Oracle to Run the Upgrade Scripts
To run the database upgrade scripts, you must prepare your Oracle system as follows:

- Setting up Rollback Segments and Temporary Tablespaces
- Granting New Privileges to the Oracle Portal User

Setting up Rollback Segments and Temporary Tablespaces
The upgrade scripts modify and sort many Portal tables. Some tables, such as EVENT_T, can contain millions of rows. The recommended rollback segment configuration for normal operation is inadequate for running the upgrade scripts. Therefore, you must adjust the size of the rollback segments to support the upgrade transactions:

- Unless your database is very small, create two or three rollback segments that are half the size of your largest table (usually the EVENT_T table).
- Take the smaller rollback segments used during normal operation offline while you run the upgrade scripts.
Granting New Privileges to the Oracle Portal User

The upgrade scripts require you to grant CREATE TABLE and CREATE SEQUENCE privileges directly to the Portal user pin.

To grant these privileges, enter these commands:

```
SQL> connect system/manager@databaseAlias
SQL> grant create table to pin;
Grant succeeded.
SQL> grant create sequence to pin;
Grant succeeded.
SQL> quit
```

Upgrading GPRS Manager

This section provides a complete list of upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

To upgrade directly from GPRS Manager Release 2.0 to Release 3.0, perform some or all of these tasks, depending on your system:

1. Backing Up GPRS Manager 2.0 Files
2. Turning Off Portal Service Authentication and Authorization
3. Shutting Down Portal
4. Backing Up Your Portal Database
5. Installing the Third-Party Software
6. Installing GPRS Manager Server 3.0
7. Installing the Upgrade Scripts
8. Configuring the Upgrade Parameters
9. Creating Required Database Objects and the Upgrade Log Directory
10. Performing Pre-Upgrade Sanity Checks
11. Generating List of Tables and Indexes in 3.0 Schema
12. Running the Database Upgrade Scripts
13. Running pin_setup to Configure GPRS Manager
14. Restoring Service Authentication
15. Dropping Obsolete Database Objects from the Database
16. Upgrading Events

Backing Up GPRS Manager 2.0 Files

Before removing the old GPRS Manager Release 2.0 packages, back up your 2.0 files. In particular, make sure you back up all customized files, including source code, pin.conf, and pin_setup.values files.

Turning Off Portal Service Authentication and Authorization

To maintain a controlled environment for pre-upgrade testing, cut off interaction between your Portal system and your customers.
For information on the Portal authentication module, see “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

**Shutting Down Portal**

1. Stop all Portal processes.
   
   Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in *BRM System Administrator’s Guide*.

2. Make sure the Connection Managers (CMs) and Data Managers (DMs) are not running.

3. Make sure no users are logged on to Portal.
   
   Users include customers, client applications, customer service representatives (CSRs), and so on.

**Backing Up Your Portal Database**

Make a complete offline backup of your Portal database, and make sure the backup is completely valid and usable. For more information on performing full database backups, see your database software documentation.

In addition to the backup, use the Oracle export utility to export all Portal tables. This helps you restore individual tables if necessary.

**Installing the Third-Party Software**

Install the Third-Party software by following the instructions given in “Installing the Third-Party Software” in *BRM Installation Guide*.

**Installing GPRS Manager Server 3.0**

1. Install the GPRS Manager Server Release 3.0 package for your platform. Follow the instructions in “Installing GPRS Manager 3.0” in *BRM Telco Integration*.

   **Caution:** Do not run the pin_setup script before upgrading your database. Running pin_setup before upgrading your database might corrupt your data.

   **Important:**
   - Pay particular attention to entries that specify your installation directory; CM and DM port numbers; and database host name, user name, and password.
   - Make sure the $SETUP_INIT_DB entry is set to YES.

2. Make a backup copy of the Portal_Home/setup/pin_setup.values file and save it to another location.

   **Important:** The upgrade scripts do not modify these files.
Installing the Upgrade Scripts

Install the upgrade package for your platform:

Configuring the Upgrade Parameters

The upgrade.cfg file contains your upgrade parameters, such as which scripts to execute and whether to upgrade only the most recent data. You should customize these parameters to meet your business requirements.

To edit the upgrade.cfg file:

1. Log in as user pin, go to Portal_Home/upgrade/gprs/20_30, and open the upgrade.cfg file in a text editor such as vi:
   
   % su - pin
   % cd Portal_Home/upgrade/gprs/20_30
   % vi upgrade.cfg

2. Configure the file’s parameters as necessary. For information on each parameter, see the comments in the upgrade.cfg file.

   Table 17–1 describes the upgrade parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQLPLUS IMP EXP</td>
<td>Specify the location of the database utilities and executables. By default, they are set to sqlplus, imp, and exp, respectively.</td>
</tr>
<tr>
<td>OWNER</td>
<td>Specifies the Portal database user name. By default, this is set to pin.</td>
</tr>
<tr>
<td>PASSWD</td>
<td>Specifies the Portal database password. By default, this is set to pin.</td>
</tr>
<tr>
<td>DBNAME</td>
<td>Specifies the name of the Portal database you are upgrading. By default, this is set to pindb.</td>
</tr>
<tr>
<td>PIN_CONF_TBLSPACEpin</td>
<td>Specify the tablespaces where your new tables and indexes will be created.</td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_SMALL</td>
<td>Specify the storage parameters to use when the tables and indexes are created. Note: Information on how your tablespace and storage parameters are configured in Release 2.0 is in your Release 3.0 Portal_Home\setup\scripts\pin_tables.values file. You can use this information to help you configure the parameters in your Release 3.0 upgrade.cfg file.</td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_MED_INS</td>
<td></td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_LARGE_INS</td>
<td></td>
</tr>
</tbody>
</table>

@ALL_SCRIPTS

Specifies which upgrade scripts are executed by the upgrade.pl script. By default, all upgrade scripts are executed.
Creating Required Database Objects and the Upgrade Log Directory

To create the database objects required for the upgrade and the upgrade log directory, run the `upg_mgr.pl` script with the `-o` parameter. For more information, see "About the upg_mgr.pl Script".

Performing Pre-Upgrade Sanity Checks

Run the `upg_mgr.pl` script with the `-s` parameter to verify the following:

- The indexes required for upgrading have been created.
- Portal storable class objects required for upgrading exist.
- The following database preparations have been made:
  - The correct version of Oracle is installed. See "Important Information for System Administrators".
  - The database character set is correct. See "Oracle Database Character Sets".
  - The Portal user `pin` has CREATE TABLE and CREATE SEQUENCE privileges. See "Granting New Privileges to the Oracle Portal User".
  - The required rollback segments exist. See "Setting up Rollback Segments and Temporary Tablespaces".

The `-s` parameter also reports how much disk space is required for event table partitioning.

Results are printed to the `Portal_Home/upgrade/gprs/20_30/sqllog/pre_upg_sanity_chk2.sql.log` file. For more information, see "About the upg_mgr.pl Script".

3. Save and close the file.
Generating List of Tables and Indexes in 3.0 Schema

To see what modifications you made to the default Release 2.0 database schema, compare the tables and indexes in your 2.0 database with those in the default 2.0 database. You need this information to interpret error messages that might be generated when you run the upgrade scripts and when you add custom tables and indexes to the upgraded Release 3.0 database.

Generating Your 3.0 Tables List

The `schema_tbsls.sql` script generates a list of your Release 3.0 database table columns and writes it to the `table_schema.out` file.

Run the `schema_tbsls.sql` script from the UNIX prompt:

```
% cd Portal_Home/upgrade/gprs/20_30
% perl upg_mgr.pl –e schema_tbsls.sql
```

Generating 3.0 Index List

The `schema_idxs.sql` script generates a list of your Release 3.0 database indexes and writes it to the `index_schema.out` file.

Run the `schema_idxs.sql` script from the UNIX prompt:

```
% cd Portal_Home/upgrade/gprs/20_30
% perl upg_mgr.pl –e schema_idxs.sql
```

Running the Database Upgrade Scripts

The `upgrade.pl` script runs a series of scripts that upgrade the Release 2.0 database to Release 3.0. By default, the `upgrade.pl` script runs all the upgrade scripts.

To run only the offline scripts, you must first edit the `upgrade.cfg` file. See "Configuring the Upgrade Parameters".

For more information about the `upgrade.pl` script, see "About the upgrade.pl Script".

To upgrade your database schema:

1. Run the `upgrade.pl` script from the UNIX prompt:

   ```
   % cd Portal_Home/upgrade/gprs/20_30
   % perl upgrade.pl
   ```

2. Check each script's log and pinlog files in the directory specified by the `UPGRADE_LOG_DIR` parameter in your `upgrade.cfg` file (by default, `Portal_Home/upgrade/gprs/20_30/sqllog`). These log files show how long each script took to execute and list any errors that occurred.

   **Important:** If any errors are reported, fix them, and then rerun the `upgrade.pl` script.
Running pin_setup to Configure GPRS Manager

The `pin_setup` script reads the `pin_setup.values` file and configures Portal by initializing the database, configuring various `pin.conf` files, and starting various servers, including the `dm_oracle` server, the Connection Manager (CM), and the Java server.

To run the `pin_setup` script:

1. Log in as user `pin`, go to the `Portal_Home/setup` directory, and run the `pin_setup` script:

```
% su - pin
% cd Portal_Home/setup
% ./pin_setup
```

2. Check the following files for errors:

- `Portal_Home/setup/pin_setup.log`
- `Portal_Home/sys/cm/CM.log`
- `Portal_Home/var/cm/cm.pinlog`
- `Portal_Home/sys/dm_database/DM.log`
- `Portal_Home/var/dm_database.dm_database.pinlog`

Restoring Service Authentication

See “Using the Authentication and Authorization Modules” in *BRM RADIUS Manager*.

Dropping Obsolete Database Objects from the Database

Perform it after you verify that the upgrade is successful.

To drop obsolete database tables and columns, run the `drop_tables.sql` script from the UNIX prompt:

```
% cd Portal_Home/upgrade/gprs/20_30
% perl upgrade.pl drop_tables.sql
```

Upgrading Events

After you upgrade GPRS Manager from Release 2.0 to Release 3.0, you must check for old duplicate event types. To perform a check on the old duplicate event types, do one of the following:

- Run GPRS Release 2.0 only to check for the old duplicate event types for the time specified by the network element. Next, run GPRS Release 2.0 and GPRS Release 3.0 in parallel to check the old and new duplicate event types respectively. Then, customize GPRS Release 3.0 to check both the old and new duplicate event types.

  **Note:** This option allows you to stay on line all the time, requires both GPRS Release 2.0 and GPRS Release 3.0, needs a custom setup to be developed, requires migrating GPRS Release 2.0 services to GPRS Release 3.0, and requires pricing for both managers.

- Run GPRS Release 3.0 to check for old duplicate event types. This can be done only if all open sessions can be closed.
Command-line Scripts

The following command-line scripts automate routine upgrade tasks:

- About the upg_mgr.pl Script
- About the upgrade.pl Script

Run these scripts from the UNIX prompt.

About the upg_mgr.pl Script

This Perl script performs many of the upgrade tasks, such as creating database objects and running sanity checks.

Syntax

perl upg_mgr.pl -o | -s | -e sql_script_name.sql | -r step_name | -d step_name | -t | -n | -h

Note:

- Specify only one parameter at a time.
- Run upg_mgr.pl with the -o parameter before you run it with any other parameters.
- If you omit sql_script_name after the -e parameter or step_name after the -r or -d parameter, the script does nothing.

Parameters

Table 17–2 describes the upg_mgr.pl parameters.
Table 17–2  upg_mgr.pl Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| -o        | Creates the database objects required for the upgrade. **Important**: Run `upg_mgr.pl` with the `-o` parameter **before** you run it with any other parameters. This parameter performs these operations:  
  - Creates the UPG_LOG_T table that logs all the information about the upgrade.  
  - Creates the `pin_upg_common` package that contains all the common routines for the upgrade. |
| -s        | Runs the pre-upgrade sanity check. See "Performing Pre-Upgrade Sanity Checks". **Note**: This requires a database administrator (DBA) user name and password for the Portal database. See the `upgrade.cfg` file for details. |
| -e sql_script_name.sql | Executes the specified SQL script against the Portal schema. It replaces all the Perl variables before running the script. **Important**: You must include the `.sql` extension with the script name. |
| -r step_name | Prints a report of the status of the specified step and directs the report to the `Portal_Home/upgrade/gprs/20_30/sqllog/step_name.sql.pinlog` file. **Important**: Do not include the file extension with the script name. |
| -d step_name | Deletes all the information related to an upgrade script from the upgrade log tables. After a script is run, its completion is logged in the upgrade log tables. If a user tries to rerun the script, the upgrade software first checks those tables. When it finds the script has already run, it skips the script. Thus, you must run `upg_mgr.pl -d` to delete all information about a previously run script from the tables **before** rerunning the script. **Important**: Do not include the file extension with the script name. |
| -t        | Displays the maximum and minimum CREATED_T for the EVENT_T, ITEM_T, and BILL_T tables. |
| -h        | Displays these parameter descriptions. |

About the upgrade.pl Script

This Perl script is the main upgrade script. It runs many other SQL scripts in the correct order.

To run all the scripts listed in the `upgrade.cfg` file's `@ALL_SCRIPTS` parameter, enter this command at the UNIX prompt:

```bash
% cd Portal_Home/upgrade/gprs/20_30
% perl upgrade.pl
```

**Note**: The scripts are run in the order they are listed in the parameter. For more information, see "Configuring the Upgrade Parameters".

To run a single script, enter this command:

```bash
% cd Portal_Home/upgrade/gprs/20_30
% perl upgrade.pl script_name.sql
```

**Important**: `script_name` must include the file extension.
About the Upgrade Scripts and Files

This section describes the scripts and files used to upgrade your Portal database.

**Offline Scripts**

Table 17–3 describes the offline scripts.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin_upg_common.sql</td>
<td>SQL script that creates the common routines needed for the upgrade.</td>
</tr>
<tr>
<td>add_new_tables_30.sql</td>
<td>SQL script that adds the new Release 3.0 tables.</td>
</tr>
</tbody>
</table>

**Online Scripts**

Table 17–4 describes the online scripts.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>update_service_type.sql</td>
<td>SQL script that updates the service type from /service/ip/gprs to</td>
</tr>
<tr>
<td></td>
<td>/service/telco/gprs and event type from /event/session/gprs to</td>
</tr>
<tr>
<td></td>
<td>/event/session/telco/gprs.</td>
</tr>
<tr>
<td>drop_tables.sql</td>
<td>SQL script that drops the obsolete tables, which are not required</td>
</tr>
<tr>
<td></td>
<td>in the new version.</td>
</tr>
</tbody>
</table>

**Miscellaneous Scripts and Files**

Table 17–5 describes the scripts and configuration files executed by offline or online scripts.

<table>
<thead>
<tr>
<th>Script or File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>schema_idxs.sql</td>
<td>SQL script that produces the index schema listings.</td>
</tr>
<tr>
<td>schema_tbls.sql</td>
<td>SQL script that produces the table schema listings.</td>
</tr>
<tr>
<td>delete_info.sql</td>
<td>SQL script that deletes the UPG_LOG_T table entries related to a specific</td>
</tr>
<tr>
<td></td>
<td>script.</td>
</tr>
<tr>
<td>get_created_t.sql</td>
<td>SQL script that retrieves the max and min CREATED_T from various tables.</td>
</tr>
<tr>
<td>pre_upg_sanitry_chk1.sql</td>
<td>SQL scripts that perform sanity checks.</td>
</tr>
<tr>
<td>pre_upg_sanitry_chk2.sql</td>
<td></td>
</tr>
<tr>
<td>crt_pinlog.sql</td>
<td>SQL script that creates the pinlog files.</td>
</tr>
<tr>
<td>pin_pre_cmp_tcframework.pl</td>
<td>Perl script that configures the tcframework component.</td>
</tr>
<tr>
<td>pin_pre_cmp_gprs_30.pl</td>
<td>Perl script that configures the gprs_30 component.</td>
</tr>
</tbody>
</table>
Table 17–5  (Cont.) Miscellaneous Scripts and Files

<table>
<thead>
<tr>
<th>Script or File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin_pre_cmp_tcf_aaa.pl</td>
<td>Perl script that configures the tcf_aaa component.</td>
</tr>
<tr>
<td>pin_pre_cmp_gprs_aaa.pl</td>
<td>Perl script that configures the gprs_aaa component.</td>
</tr>
<tr>
<td>upgrade.cfg</td>
<td>Configuration file in which you must enter details about the Oracle Server database configuration before you run the upgrade scripts. All the upgrade Perl scripts parse this file to get the database connection parameters.</td>
</tr>
<tr>
<td>upg_oracle_functions.pl</td>
<td>Perl script that performs many miscellaneous upgrade tasks related to the Oracle database.</td>
</tr>
<tr>
<td>upg_mgr.pl</td>
<td>Perl script that manages many miscellaneous upgrade tasks.</td>
</tr>
<tr>
<td>upgrade.pl</td>
<td>Master Perl script for the upgrade process. This Perl script calls other SQL scripts to perform the upgrade.</td>
</tr>
<tr>
<td>crt_upg_indexes.sql</td>
<td>SQL script that creates a unique index for BILL_T, EVENT_T, ITEM_T tables.</td>
</tr>
<tr>
<td>drop_procedures.sql</td>
<td>SQL script that drops all the stored procedures from the Portal schema.</td>
</tr>
</tbody>
</table>
Migrating Data to an Oracle In-Memory Database Cache-Enabled BRM System

This document describes how to migrate data from an Oracle Communications Billing and Revenue Management (BRM) system to an Oracle In-Memory Database (IMDB) Cache-enabled BRM system.

**Note:** The information applies to customers who have created accounts on a BRM system before IMDB Cache Manager was installed; it does not apply to customers performing a new BRM installation whose original system setup includes IMDB Cache Manager.

Before you read this document, you should be familiar with:

- BRM architecture.
- BRM IMDB Cache Data Manager.
- Oracle IMDB Cache. See the Oracle IMDB Cache documentation.

**About Migrating Data to an Oracle IMDB Cache-Enabled BRM System**

If you have an existing BRM system with or without a Transactional In-Memory Object Store (TIMOS) environment and you want to use BRM in conjunction with Oracle IMDB Cache, you must install the BRM optional manager IMDB Cache Manager and migrate your data on a BRM system to an Oracle IMDB Cache-enabled BRM system.

**Note:** If you have existing BRM data created on a BRM system before IMDB Cache Manager was installed, you must run the `load_pin_uniqueness` utility.

Migrating your BRM system to an Oracle IMDB Cache-enabled system includes:

- Preparing existing account data *(created in your BRM system before using an Oracle IMDB Cache environment)* for an Oracle IMDB Cache-enabled BRM environment.
- Migrating accounts from your BRM database to the Oracle IMDB Cache logical partitions.
- Migrating a BRM TIMOS environment to the Oracle IMDB Cache environment.
For an overview of the tasks required to migrate your BRM system to an Oracle IMDB Cache-enabled system, see "Overview of the Migration Process".

For information on how the migration process works, see:

- How IMDB Cache Manager Migrates Your Existing BRM Accounts
- How IMDB Cache Manager Handles Subscriber Distribution for Account Migration
- How IMDB Cache Manager Handles POID Fields

For information on how core BRM is modified after you install IMDB Cache Manager, see "Changes to BRM after Installing IMDB Cache Manager".

**BRM Processes That Cannot Co-exist with IMDB Cache Manager**

When you upgrade to a BRM system with IMDB Cache Manager, the following BRM processes cannot co-exist with IMDB Cache Manager:

- Oracle DM

  In a BRM system with IMDB Cache DM, IMDB Cache DM replaces the Oracle DM.

  **Important:** During BRM 7.4 installation, the CM and Oracle DM are required and started up automatically by the pin_setup process.

  When you configure a BRM system with IMDB Cache Manager, configure the CM to connect only to IMDB Cache DM.

- TIMOS DM

  The functionality of IMDB Cache Manager and the Oracle IMDB Cache replaces the functionality of the TIMOS DM and the TIMOS DM reference object cache (ROC). If you have a BRM system with TIMOS DM, you must stop the TIMOS DM, CM, and Oracle DM processes before you perform certain phases of the upgrade.

**How IMDB Cache Manager Migrates Your Existing BRM Accounts**

This section explains how BRM and IMDB Cache Manager migrate the data in your BRM system to a BRM system with IMDB Cache Manager.

The Portal object ID (POID) of fields in a BRM system is in the format `0.0.0.Schema_No`. The POID of fields in a BRM system with IMDB Cache Manager is in the format `0.LogicalPartition_No.0.Schema_No`.

When the accounts in your BRM system migrate to a BRM system with IMDB Cache Manager, the upgrade process updates the POID to include the Oracle IMDB Cache logical partition number of the logical partition into which the accounts are migrated.

The `load_pin_uniqueness` utility:

- Sets and updates the logical partition number in the `/uniqueness` object POID that is stored in the BRM database so that it can be used later by the `tt_load.sql` script to load the data into IMDB Cache.

- Populates the `/uniqueness` table with uniqueness data for the accounts in your BRM system.

- Finds out which logical partition the accounts fit into and then updates the account POID database numbers in the `/uniqueness` table.
After `load_pin_uniqueness` figures out how to distribute the accounts among the logical partitions, the `tt_load.sql` script uses the data in the `/uniqueness` table to determine the Oracle IMDB Cache data stores in which to load the subscriber data for the accounts and loads the subscriber data.

---

**Note:** You run the `load_pin_uniqueness` utility only if you need to migrate accounts that were created on a BRM system that was not IMDB Cache-enabled. After your accounts are migrated, you do not need to run this utility again.

---

### How IMDB Cache Manager Handles Subscriber Distribution for Account Migration

Before accounts from your BRM system can be distributed among the logical partitions of Oracle IMDB Cache, they must be assigned to logical partitions.

The `load_pin_uniqueness` utility assigns the accounts from your BRM system to the logical partitions as follows:

- Finds accounts that are not updated in the `/uniqueness` table.
- Obtains the maximum account size and the current account size of the logical partition that the accounts may go into.
- Considers the maximum account size and the current account size of each logical partition and attempts to distribute accounts equally among logical partitions.
- If the logical partition reaches the limit, the remaining accounts are not distributed.
- Checks whether all the logical partitions of a schema can accommodate all the accounts of that schema.
- If all of the logical partitions of a schema cannot accommodate all of the accounts of that schema, throws an error message.
- Distributes accounts of a schema across all the logical partitions of the schema.

### How IMDB Cache Manager Handles POID Fields

The BRM database and IMDB Cache do not store the logical partition number in the POID fields of their data. IMDB Cache Manager stores the logical partition number in its run-time memory. For the CM and its associated Facilities Modules (FMs) to know in which logical partition an account resides, the IMDB Cache DM does the following for all POID fields:

- Clears the logical partition number from the POID
- Writes the POID database numbers to the storage media
- Gets the POID database numbers from the storage media
- Updates the POID database numbers with the logical partition number in its memory
- Sends the resulting POID database numbers, which now include the logical partition number (of the current residing logical partition), to the CM

The IMDB Cache DM updates the POID fields with the logical partition number for all fields that store POIDs, including fields that store POIDs in string format.
Overview of the Migration Process

Using the Same Logical Partition for Hierarchical Accounts

During billing, BRM migrates a parent account to the logical partition where the child account resides. After billing, BRM migrates the parent account and its related instances back to its original logical partition to avoid having a load imbalance among logical partitions. BRM uses the /uniqueness object for account lookup to obtain the logical partition number of the parent account and move it back to that logical partition.

Frequent migration of accounts between logical partitions can degrade performance. For improved performance, Oracle recommends you load all hierarchical accounts into one logical partition.

Overview of the Migration Process

If you have an existing BRM system, you perform a functional and technical upgrade to migrate to a BRM system that is Oracle IMDB Cache-enabled as follows:

1. Upgrade to BRM 7.4.
   You must upgrade to BRM 7.4 before you migrate to an Oracle IMDB Cache-enabled BRM system.
2. Install BRM 7.4 Patch Set 8.
   BRM 7.4 Patch Set 8 is the core BRM system requirement to use IMDB Cache Manager.
3. Stop the Connection Manager (CM) and Oracle Data Manager (DM) processes.
4. If you are migrating from a BRM TIMOS environment, stop the TIMOS DM.
5. Set up your Oracle IMDB Cache environment.
6. Install IMDB Cache Manager.

   **Note:** The IMDB Cache Manager released for Solaris in BRM 7.4 with Patch Set 5 (9859388) and Interim Patch 10043975 does not include support for migrating your existing BRM accounts into an Oracle IMDB Cache-enabled system. If you have this version, you must install IMDB Cache Manager as a full package from the Oracle E-Delivery Web site.

7. Start the IMDB Cache Manager DM and CM processes.
8. Truncate or clean up the /uniqueness objects.

   **Note:** This is applicable in a multischema environment only.

9. Start the DM.
10. Stop the **config_pin_distribution** process.
11. Run the **load_pin_uniqueness** utility.
12. Configure the IMDB Cache DM, CM, and **load_pin_uniqueness** utility for migration. See "Configuration Entries Required for Migration".
13. Preparing Accounts for Distribution into IMDB Cache Logical Partitions
14. Migrating a BRM TIMOS Environment to an IMDB Cache Environment
15. Loading Subscriber Data from the BRM Database into the Oracle IMDB Cache Data Stores

Configuration Entries Required for Migration

To configure your IMDB Cache DM, CM, and load_pin_uniqueness utility for migrating BRM data:

1. Open the IMDB Cache DM configuration file (BRM_Home/sys/dm_tt/pin.conf) in a text editor.
2. Add the following entry:
   ```
   - dm poids_in_string_format_list
     PIN_FLD_ACCOUNT_NO,PIN_FLD_ITEM_POID_LIST,PIN_FLD_EVENT_POID_LIST,PIN_FLD_NEXT_ITEM_POID_LIST,PIN_FLD_GL_REPORT_POID_LIST
   ```
   This entry updates the POID fields with the Oracle IMDB Cache logical partition number.
3. Save and close the file.
4. Open the CM configuration file (BRM_Home/sys/cm/pin.conf) in a text editor.
5. Add the following uniqueness_login entry:
   ```
   - cm uniqueness_login 1
   ```
6. Add the following use_legacy_uniqueness_population entry:
   ```
   - fm_cust use_legacy_uniqueness_population 0
   ```
7. Add the following primary_db entry:
   ```
   - cm primary_db 0.0.0.1 / 0
   ```
8. Save and close the file.
9. Open the load_pin_uniqueness utility configuration file (BRM_Home/apps/multi_db/pin.conf) in a text editor.
10. Add the following is_timesten entry:
    ```
        - load_pin_uniqueness is_timesten 1
    ```
11. Add the following per_schema_node_info entry:
    ```
        - load_pin_uniqueness per_schema_node_info DB_NO:DB_NO
    ```
    where:
    
    DB_NO:DB_NO is the per-schema logical partition information.

    For example:
    If the schema 0.0.0.1 has three logical partitions (0.0.0.1, 0.1.0.1, and 0.2.0.1), the entry is:
    ```
    - load_pin_uniqueness per_schema_node_info 0.0.0.1:0.1.0.1:0.2.0.1
    ```
12. Add the following entry:
    ```
    - load_pin_uniqueness -g
    ```
The `-g` parameter assigns all the group accounts to the same node. If you do not specify this parameter, group accounts are considered as non-group accounts and the distribution follows the round-robin method.

13. Save and close the file.

Preparing Accounts for Distribution into IMDB Cache Logical Partitions

To prepare your existing account data for migration and distribution into available logical partitions of the Oracle IMDB Cache:

1. Run the `load_pin_uniqueness` utility.
   
   You must run `load_pin_uniqueness` as described in “Installing and Configuring a BRM System with In-Memory Database Cache Manager,” in Chapter 8 of the BRM Installation Guide.

2. Stop and restart the CM.

3. Verify that the `/uniqueness` object was loaded by using the Object Browser or by using the `robj` command with the `testnap` utility.

   Your data is ready to be loaded into the Oracle IMDB Cache data stores. See “Loading Subscriber Data from the BRM Database into the Oracle IMDB Cache Data Stores”.

Migrating a BRM TIMOS Environment to an IMDB Cache Environment

This section describes configuration procedures you must follow if you use a BRM system with TIMOS DM.

To migrate a BRM TIMOS environment to an Oracle IMDB Cache environment:

1. Stop the CM.
2. Stop TIMOS DM.
3. Stop the Oracle DM.
4. Open the `BRM_Home/sys/cm/pin.conf` file in a text editor.
5. Set the `dm_pointer` entry to point to the IMDB Cache DM host name and port number.

   ```
   - cm dm_pointer 0.0.0.1 ip DMTT_Host Port
   
   where `DMTT_Host` is the IMDB Cache DM host name.
   ```

   **Note:** You must remove the TIMOS entry and add the IMDB Cache DM host name and port number.

6. Start the IMDB Cache DM.
7. Start the CM.
8. Run the `load_pin_uniqueness` utility.

   **Note:** The transient objects are not migrated.
Loading Subscriber Data from the BRM Database into the Oracle IMDB Cache Data Stores

To load subscriber data from the BRM database into the Oracle IMDB Cache data stores:

1. Run `pin_tt_schema_gen`, which generates the schema and load SQL files.
2. Connect to Oracle IMDB Cache using `ttIsql`.
3. Run the `tt_load.sql` script against the appropriate Oracle IMDB Cache logical partition.

For detailed instructions, see “Installing and Configuring a BRM System with In-Memory Database Cache Manager,” in Chapter 8 of the BRM Installation Guide.

Changes to BRM after Installing IMDB Cache Manager

This section describes changes made to the base BRM 7.4 release after you install IMDB Cache Manager.

Opcode Changes

After you install IMDB Cache Manager (the `if_tt_enabled` flag is enabled), opcode modifications described in Table 18–1 occur.

<table>
<thead>
<tr>
<th>Changed opcode</th>
<th>Changed opcode flow in a Oracle IMDB Cache environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCM_OP_ACT_FIND</td>
<td>Uses the <code>/uniqueness</code> object to obtain account and service data for a given account login.</td>
</tr>
<tr>
<td></td>
<td>Performs uniqueness lookup in a single schema environment.</td>
</tr>
<tr>
<td></td>
<td>Does not perform global search in a single schema environment.</td>
</tr>
<tr>
<td>PCM_OP_CUST_COMMIT_CUSTOMER</td>
<td>Updates the <code>/uniqueness</code> table.</td>
</tr>
<tr>
<td>PCM_OP_CUST_MODIFY_CUSTOMER</td>
<td>Updates the <code>/uniqueness</code> table.</td>
</tr>
<tr>
<td>PCM_OP_CUST_SET_LOGIN</td>
<td>Updates the <code>/uniqueness</code> table.</td>
</tr>
<tr>
<td>PCM_OP_CUST_MODIFY_SERVICE</td>
<td>Updates the <code>/uniqueness</code> table.</td>
</tr>
<tr>
<td>PCM_OP_CUST_DELETE_ACCT</td>
<td>Updates the <code>/uniqueness</code> table.</td>
</tr>
<tr>
<td>PCM_OP_TCF_AAA_AUTHORIZE</td>
<td>Uses the <code>/uniqueness</code> table for service lookup in a single schema environment.</td>
</tr>
<tr>
<td>PCM_OP_TCF_AAA_REAUTHORIZE</td>
<td>Uses the <code>/uniqueness</code> table for service lookup in a single schema environment.</td>
</tr>
<tr>
<td>PCM_OP_TCF_AAA_STOP_ACCOUNTING</td>
<td>Uses the <code>/uniqueness</code> table for service lookup in a single schema environment.</td>
</tr>
</tbody>
</table>

Utility Changes

After you install IMDB Cache Manager (the `if_tt_enabled` flag is enabled), utility modifications described in Table 18–2 occur.
<table>
<thead>
<tr>
<th>Utility</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>load_pin_uniqueness</td>
<td>Distributes accounts among Oracle IMDB Cache logical partitions.</td>
</tr>
<tr>
<td>pin_tt_schema_gen</td>
<td>Generates the load command (tt_load.sql) based on uniqueness lookup information (the /uniqueness table entry).</td>
</tr>
</tbody>
</table>
Part IV

Upgrading Pipeline Manager

This part contains information about upgrading the Pipeline Manager.

Part IV contains the following chapters:

- Upgrading from Pipeline Manager 7.2 to Pipeline Manager 7.3
Upgrading from Pipeline Manager 7.2 to Pipeline Manager 7.3

This document contains procedures for upgrading from Portal™ Pipeline Manager 7.2 to Pipeline Manager 7.3. It covers Oracle on both HP-UX and Solaris.

**Important:** Before performing the tasks in this document, see "About Upgrading BRM Releases" for information on how to plan, prepare for, and test your upgrade.

If you are installing Pipeline Manager for the first time, see “Installing Pipeline Manager” in BRM Installation Guide for installation and configuration instructions.

**Important information for System Administrators**

- Pipeline Manager requires an Oracle 9i or 10g database.
- To upgrade any data stored in custom tables, you must create additional SQL scripts. To run these scripts with the default upgrade scripts, add appropriate SQL file entries to the upgrade configuration file, upgrade.cfg. For more information, see "Updating Database Customizations" and "Configuring the Upgrade Parameters".

**Oracle Database Character Sets**

Portal supports the UTF8 character set only. If you haven't already done so, you should move your data to a new UTF8 database before you upgrade. For more information about exporting your existing data to a UTF8 database, see “Modifying Your Oracle Database Installation” in BRM Installation Guide.

**Verifying the Pipeline Manager Release Number**

You must ensure that you are using Pipeline Manager 7.2. You can check the release number by issuing this command:

```
ifw -v
```
Upgrading the Oracle Software and Database

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

You can use Pipeline Manager with Oracle 9i or 10g only.

Granting New Privileges to the Portal Integrate User

The upgrade scripts require you to grant CREATE TABLE, CREATE PROCEDURE, CREATE SESSION, and RESOURCE privileges directly to the Portal user integrate.

To grant these privileges, enter these commands:

```
sqlplus connect system/manager@databaseAlias
SQL> grant create table to integrate;
Grant succeeded.
SQL> grant create procedure to integrate;
Grant succeeded.
SQL> grant create session to integrate;
Grant succeeded.
SQL> grant resource to integrate;
Grant succeeded.
SQL> quit
```

Upgrading Pipeline Manager

This section provides a complete list of upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

To upgrade directly from Pipeline Manager 7.2 to Pipeline Manager 7.3, perform some or all of these tasks, depending on your system:

1. Shutting Down Pipeline Manager.
2. Uninstalling Pipeline Manager 7.2.
3. Installing the Third-Party software
4. Installing Pipeline Manager
5. Installing the Upgrade Scripts
6. Configuring the Upgrade Parameters
7. Creating Required Database Objects and the Upgrade Log Directory
8. Running the Database Upgrade Scripts
9. Re-creating your Account Synchronization Queues
10. Enabling Auditable Fields
11. Testing the Upgraded Pipeline System
12. Loading the Tailor-Made Stored Procedure
Shutting Down Pipeline Manager

To shut down Pipeline Manager, create a semaphore file with the following entry:

```plaintext
ifw.Active=False
```

For more information, see “Starting and stopping the BRM system” in *BRM System Administrator’s Guide*.

Uninstalling Pipeline Manager 7.2

**Important:** Before you uninstall Pipeline Manager 7.2, back up the wireless registry file.

To uninstall Pipeline Manager 7.2, run the `Pipeline_Home/uninstaller/Pipeline/uninstaller.bin` program.

Installing the Third-Party software

Install the Third-Party software by following the instructions given in “Installing the Third-Party software” in *BRM Installation Guide*.

Installing Pipeline Manager

Install Pipeline Manager by following the instructions given in “Installing Pipeline Manager” in *BRM Installation Guide*, but **DO NOT** set the Portal framework environment or configure the Pipeline Manager database.

After installation, edit the wireless registry file by referring to the backed-up wireless registry file.

Installing the Upgrade Scripts

To install the scripts to upgrade Pipeline Manager 7.2 to Pipeline Manager 7.3:

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

**Important:**
- If you download to a Windows workstation, use FTP to copy the `.bin` file to a temporary directory on your UNIX server.
- You must increase the heap size used by the Java Virtual Machine (JVM) before running the installation program to avoid “Out of Memory” error messages in the log file. For information, see “Increasing heap size to avoid ‘Out of Memory’ error messages” in *BRM Installation Guide*.

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

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

source source.me.sh

C shell:

source source.me.csh

3. Log in as user integrate, go to the temp_dir directory, and enter this command:

   7.3_Pipeline_Upgrade_72_73_platform_32_opt.bin

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

4. Follow the instructions displayed during installation.

**Configuring the Upgrade Parameters**

The upgrade.cfg file contains your upgrade parameters. You should customize these
parameters to meet your business requirements.

To edit the upgrade.cfg file:

1. Log in as user pin, go to Pipeline_Home/upgrade/integrate/72_73, and open the
   upgrade.cfg file in a text editor such as vi:

   % su - pin
   % cd Pipeline_Home/upgrade/integrate/72_73
   % vi upgrade.cfg

2. Configure the file's parameters as necessary. For information on each parameter,
   see the comments in the upgrade.cfg file.

   Table 19–1 describes the upgrade.cfg parameters.

   _______________________________________________________________________
   Table 19–1 upgrade.cfg Parameters
   _______________________________________________________________________

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER</td>
<td>Specify the pipeline database user name. By default, this is set to integrate.</td>
</tr>
<tr>
<td>PASSWD</td>
<td>Specify the pipeline database password. By default, this is set to integrate.</td>
</tr>
<tr>
<td>DBNAME</td>
<td>Specify the name of the pipeline database you are upgrading. By default, this is set to pindb.</td>
</tr>
</tbody>
</table>

**Creating Required Database Objects and the Upgrade Log Directory**

To create the database objects required for the upgrade and the upgrade log directory,
run the Pipeline_Home/upgrade/integrate/72_73/crt_upg_obj.pl script:

   % cd Pipeline_Home/upgrade/integrate/72_73
   % perl crt_upg_obj.pl

**Running the Database Upgrade Scripts**

The upgrade.pl script runs a series of scripts that upgrade the Release 7.2 pipeline
database to 7.3.
For more information about the upgrade.pl script, see "About the Upgrade.pl Script".

To upgrade your database schema:

1. Run the upgrade.pl script from the UNIX prompt:
   
   ```
   % cd Pipeline_Home/upgrade/integrate/72_73
   % perl upgrade.pl
   ```

2. Check each script’s log and pinlog file in the directory specified by the UPGRADE_LOG_DIR parameter in your upgrade.cfg file. The default log file name and path is Pipeline_Home/upgrade/integrate/72_73/sqllog.

   **Important:** If any errors are reported, fix them, and then rerun the upgrade.pl script.

---

### Re-creating your Account Synchronization Queues

Re-create the Account Synchronization queues in your system by using the pin_ifw_sync_oracle utility. This also loads updated versions of the Account Synchronization utilities and stored procedures. For more information, see “Creating additional Account Synchronization Queues” in **BRM Installation Guide**.

### Enabling Auditable Fields

To enable auditable fields in the objects, go to the Pipeline_Home/apps/integrate_sync directory and run the pin_history_on script:

```
% cd Pipeline_Home/apps/integrate_sync
% perl pin_history_on -dv pin_history_on_input
```

### Testing the Upgraded Pipeline System

Test your upgraded pipeline system by running various daily operations on it. For more information, see "Testing Your Upgraded System".

### Loading the Tailor-Made Stored Procedure

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

After upgrading the pipeline from Release 7.2 to 7.3, you must load the stored procedure. For more information, see “Loading the tailor-made stored procedure” in **BRM Installation Guide**.

---

### Command-line Scripts

The following command-line scripts automate routine upgrade tasks:

- About the crt_upg_obj.pl Script
- About the Upgrade.pl Script
- About the Upgrade Scripts and Files

Run these scripts from the UNIX prompt.
About the `crt_upg_obj.pl` Script

The `crt_upg_obj.pl` Perl script (`Pipeline_Home/upgrade/integrate/72_73/crt_upg_obj.pl`) performs many of the upgrade tasks, such as creating database objects.

```bash
% cd Pipeline_Home/upgrade/integrate/72_73
% perl crt_upg_obj.pl
```

About the Upgrade.pl Script

The `upgrade.pl` Perl script is the main upgrade script. It runs many other SQL scripts in the order they are listed.

To run all the scripts listed in the `upgrade.cfg` file's `@ALL_SCRIPTS` parameter, enter this command at the UNIX prompt:

```bash
% cd Pipeline_Home/upgrade/integrate/72_73
% perl upgrade.pl
```

**Note:** The scripts are run in the order they are listed in the parameter. For more information, see "Configuring the Upgrade Parameters".

About the Upgrade Scripts and Files

Table 19–2 describes the scripts and files used to upgrade your pipeline database to 7.3:

<table>
<thead>
<tr>
<th>Script or File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pin_upg_common.sql</code></td>
<td>SQL script that creates the common routines needed for the upgrade.</td>
</tr>
<tr>
<td><code>delete_info.sql</code></td>
<td>SQL script that deletes the UPG_LOG_T table entries related to a specific script.</td>
</tr>
<tr>
<td><code>crt_pinlog.sql</code></td>
<td>SQL script that creates the <code>pinlog</code> files.</td>
</tr>
<tr>
<td><code>upgrade.cfg</code></td>
<td>Configuration file in which you must enter details about the Oracle database configuration before you run the upgrade scripts. All the upgrade Perl scripts parse this file to get the database connection parameters.</td>
</tr>
<tr>
<td><code>upg_oracle_functions.pl</code></td>
<td>Perl script that performs many miscellaneous upgrade tasks related to the Oracle database.</td>
</tr>
<tr>
<td><code>crt_upg_obj.pl</code></td>
<td>Perl script that adds new objects.</td>
</tr>
<tr>
<td><code>upgrade.pl</code></td>
<td>Perl script that manages many miscellaneous upgrade tasks.</td>
</tr>
<tr>
<td><code>upg_mgr.pl</code></td>
<td>Master Perl script for the upgrade process. This Perl script calls other SQL scripts to perform the upgrade.</td>
</tr>
<tr>
<td><code>schema_idxs.sql</code></td>
<td>SQL script that creates a list of indexes in the 7.3 pipeline schema.</td>
</tr>
<tr>
<td><code>schema_tbls.sql</code></td>
<td>SQL script that creates a list of tables in the 7.3 pipeline schema.</td>
</tr>
<tr>
<td><code>schema_idxs.pl</code></td>
<td>Perl script that calls the <code>schema_idxs.sql</code> file to produce the index schema listings.</td>
</tr>
<tr>
<td><code>schema_tbls.pl</code></td>
<td>Perl script that calls the <code>schema_tbls.sql</code> file to produce the table schema listings.</td>
</tr>
</tbody>
</table>
Table 19–2 (Cont.) Upgrade Scripts and Files

<table>
<thead>
<tr>
<th>Script or File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>add_new_columns_pipeline_73.sql</td>
<td>SQL script that adds the 7.3 columns.</td>
</tr>
<tr>
<td>add_new_indexes_pipeline_73.sql</td>
<td>SQL script that adds the 7.3 indexes.</td>
</tr>
<tr>
<td>add_new_tables_pipeline_73.sql</td>
<td>SQL script that adds the 7.3 tables.</td>
</tr>
<tr>
<td>default_values_pipeline_73.sql</td>
<td>SQL script that inserts default values into the newly added columns.</td>
</tr>
<tr>
<td>drop_old_columns_pipeline_73.sql</td>
<td>SQL script that drops all objects in the database.</td>
</tr>
</tbody>
</table>
This part contains information about upgrading your GSM Manager system directly from Release 1.0 to Release 2.0.

Part V contains the following chapter:

- Upgrading from GSM Manager Release 1.0 to Release 2.0
Upgrading from GSM Manager Release 1.0 to Release 2.0

This document contains procedures for upgrading your GSM Manager system directly from Release 1.0 to Release 2.0. It covers Oracle on both HP-UX and Solaris platforms.

---

**Note:** If the slash character used in this document to separate elements in a path does not work in your operating system, replace that character with the appropriate one. For example, if you use UNIX, replace the backslashes in the following path with forward slashes: `Portal_Home\upgrade\gsm\10_20\upgrade.cfg`.

---

**Note:** You need to upgrade GSM Manager Release 1.0 to Release 2.0 only if you are upgrading from Infranet Release 6.5 to Portal 7.3.

---

### About Upgrading GSM Manager

- Install new GSM Manager software.
- Update the GSM Manager database. The new GSM Manager release includes an updated database schema with new tables and indexes. You use upgrade scripts to update your GSM Manager database to the new schema.

### Important Information for System Administrators

Note the following important information:

- GSM Manager 2.0 runs only on the Oracle 9i or 10g database.
- To upgrade any data stored in custom tables, you must create additional SQL scripts. To run these scripts with the default upgrade scripts, add appropriate SQL file entries to the upgrade configuration file, `upgrade.cfg`. For more information, see “Configuring the Upgrade Parameters”.

### Oracle Database Character Sets

Portal supports only the UTF8 character set on Oracle. If you haven't already done so, you should move your data to a new UTF8 database before you upgrade. For more information about exporting your existing data to a UTF8 database, see “Modifying your Oracle database Installation” in *BRM Installation Guide*.
Preparing Your Environment for the Upgrade

After preparing your environment, prepare your database:

- Reviewing the Default Database Schema
- Preparing an Oracle Database

Reviewing the Default Database Schema

Before running the database upgrade scripts, review the default database schema changes between Release 1.0 and Release 2.0. Knowing the schema changes helps you plan your upgrade. For example, if 2.0 contains many new tables, you might need to increase the disk space for your 2.0 database. If your 1.0 custom applications refer to tables that have been modified or deleted in 2.0, you might need to update the applications for 2.0.

To review database schema changes, temporarily install the Release 2.0 database upgrade files on a supplementary server.

In addition, perform the database-specific tasks described in the section “Preparing an Oracle Database”.

Preparing an Oracle Database

If you use an Oracle database, perform the following tasks before upgrading Portal:

- Upgrading the Oracle Software and Database
- Changing the Database Character Set to UTF8
- Configuring Oracle to Run the Upgrade Scripts

Upgrading the Oracle Software and Database

You can use GSM Manager 2.0 only on Oracle 9i or 10g.

Caution: If you are using an earlier version of Oracle, you must upgrade it before you install GSM Manager 2.0. For information on upgrading Oracle, see your Oracle documentation.

Changing the Database Character Set to UTF8

GSM Manager 2.0 supports only the UTF8 character set. If your database character set is not UTF8, re-create your database with the UTF8 database character set.

For information on changing the database character set, see your Oracle documentation.

Configuring Oracle to Run the Upgrade Scripts

To run the database upgrade scripts, you must prepare your Oracle system as follows:

- Setting Up Rollback Segments and Temporary Tablespaces
- Granting New Privileges to the Oracle Portal User

Setting Up Rollback Segments and Temporary Tablespaces

The upgrade scripts modify and sort many Portal tables. Some tables, such as EVENT_T, can contain millions of rows. The recommended rollback segment configuration for normal operation is inadequate for running the upgrade scripts. Therefore, you must adjust the size of the rollback segments to support the upgrade transactions:
- Unless your database is very small, create two or three rollback segments that are half the size of your largest table (usually the EVENT_T table).

- Take the smaller rollback segments used during normal operation offline while you run the upgrade scripts.

**Granting New Privileges to the Oracle Portal User**

The upgrade scripts require you to grant CREATE TABLE and CREATE SEQUENCE privileges directly to the Portal user `pin`.

To grant these privileges, enter these commands:

```sql
SQL> connect system/manager@databaseAlias
SQL> grant create table to pin;
Grant succeeded.
SQL> grant create sequence to pin;
Grant succeeded.
SQL> quit
```

**Upgrading GSM Manager**

This section provides a complete list of upgrade tasks. Some tasks are optional or apply only to certain platforms or system configurations. Be sure to check whether a task is required for your system.

To upgrade directly from GSM Manager Release 1.0 to Release 2.0, perform some or all of these tasks, depending on your system:

1. **Backing Up GSM Manager 1.0 Files**
2. **Turning Off Portal Service Authentication and Authorization**
3. **Shutting Down Portal**
4. **Backing Up Your Portal Database**
5. **Installing the Third-Party Software**
6. **Installing GSM Manager Server 2.0**
7. **Installing the Upgrade Scripts**
8. **Configuring the Upgrade Parameters**
9. **Creating Required Database Objects and the Upgrade Log Directory**
10. **Performing Pre-Upgrade Sanity Checks**
11. **Generating a List of Tables and Indexes in the 2.0 Schema**
12. **Running the Database Upgrade Scripts**
13. **Installing Patch 4489**
14. **Running pin_setup to Configure GSM Manager**
15. **Restoring Service Authentication**
16. **Dropping Obsolete Database Objects from the Database**

**Backing Up GSM Manager 1.0 Files**

Before removing the old GSM Manager Release 1.0 packages, back up your 1.0 files. In particular, make sure you back up all customized files, including source code, `pin.conf`, and `pin_setup.values` files.
Turning Off Portal Service Authentication and Authorization

To maintain a controlled environment for pre-upgrade testing, cut off interaction between your Portal system and your customers.

For information on the Portal authentication module, see “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.

Shutting Down Portal

1. Stop all Portal processes.
   
   Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in BRM System Administrator’s Guide.

2. Make sure the Connection Managers (CMs) and Data Managers (DMs) are not running.

3. Make sure no users are logged on to Portal.
   
   Users include customers, client applications, customer service representatives (CSRs), and so on.

Backing Up Your Portal Database

Make a complete offline backup of your Portal database, and make sure the backup is completely valid and usable. For more information on performing full database backups, see your database software documentation.

In addition to the backup, use the Oracle export utility to export all Portal tables. This helps you restore individual tables if necessary.

Installing the Third-Party Software

Install the Third-Party software by following the instructions given in “Installing the Third-Party Software” in BRM Installation Guide.

Installing GSM Manager Server 2.0

**Important:** Before installing GSM Manager and the Wireless Provisioning Data Manager, you should be familiar with the overall wireless integration installation procedure. See the following documents: “About Integrating Wireless Services” and “Installing and Configuring GSM Manager and Provisioning Data Manager” in BRM Telco Integration.

To install GSM Manager Server Release 2.0:

1. Install the GSM Manager Server Release 2.0 package for your platform. Follow the instructions in “Installing and Configuring GSM Manager and Provisioning Data Manager” in BRM Telco Integration.

**Caution:** Do not run the `pin_setup` script before upgrading your database. Running `pin_setup` before upgrading your database might corrupt your data.
Important:

- Pay particular attention to entries that specify your installation directory; CM and DM port numbers; and database host name, user name, and password.
- Make sure the $SETUP_INIT_DB entry is set to YES.

2. Make a backup copy of the release Portal_Home/setup/pin_setup.values file, and save it to another location.

Important: The upgrade scripts do not modify these files.

Installing the Upgrade Scripts

To install the GSM Manager-Release-1.0-to-Release-2.0 upgrade scripts:

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

Important:

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

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

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

Bash shell:

source source.me.sh

C shell:

source source.me.csh

3. Log in as user integrate, go to the temp_dir directory, and enter this command:

7.3_GSM_10_20_OraUpg_platform_32_opt.bin

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

**Configuring the Upgrade Parameters**

The `upgrade.cfg` file contains your upgrade parameters, such as which scripts to execute and whether to upgrade only the most recent data. You should customize these parameters to meet your business requirements.

To edit the `upgrade.cfg` file:

1. Log in as user `pin`, go to `Portal_Home/upgrade/gsm/10_20`, and open the `upgrade.cfg` file in a text editor such as `vi`:

   ```
   % su - pin
   % cd Portal_Home/upgrade/gsm/10_20
   % vi upgrade.cfg
   ```

2. Configure the file’s parameters as necessary. For information on each parameter, see the comments in the `upgrade.cfg` file.

   Table 20–1 describes the parameters in `upgrade.cfg`.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| SQLPLUS
   IMP
   EXP                     | Specify the location of the database utilities and executables. By default, they are set to `sqlplus`, `imp`, and `exp`, respectively.        |
| OWNER                     | Specifies the Portal database user name. By default, this is set to `pin`.                                                                    |
| PASSWD                    | Specifies the Portal database password. By default, this is set to `pin`.                                                                     |
| DBNAME                    | Specifies the name of the Portal database you are upgrading. By default, this is set to `pindb`.                                                 |
| PIN_CONF_TBLSPACE$          | Specify the tablespaces where your new tables and indexes will be created.                                                                   |
| PIN_CONF_STORAGE_SMALL     | Specify the storage parameters to use when the tables and indexes are created.                                                              |
| PIN_CONF_STORAGE_SMALL_INS | Information on how your tablespace and storage parameters are configured in Release 1.0 is in your Release 2.0 `Portal_Home\setup\scripts\pin_tables.values` file. You can use this information to help you configure the parameters in your Release 2.0 `upgrade.cfg` file. |
| PIN_CONF_STORAGE_MED       |                                                                                                                                              |
| PIN_CONF_STORAGE_MED_INS   |                                                                                                                                              |
| PIN_CONF_STORAGE_LARGE     |                                                                                                                                              |
| PIN_CONF_STORAGE_LARGE_INS |                                                                                                                                              |
| @ALL_SCRIPTS               | Specifies which upgrade scripts are executed by the `upgrade.pl` script. By default, all upgrade scripts are executed.                        |
Creating Required Database Objects and the Upgrade Log Directory

To create the database objects required for the upgrade and the upgrade log directory, run the `upg_mgr.pl` script with the `-o` parameter. For more information, see "About the `upg_mgr.pl` Script".

Performing Pre-Upgrade Sanity Checks

Run the `upg_mgr.pl` script with the `-s` parameter to verify the following:

- The indexes required for upgrading have been created.
- Portal storable class objects required for upgrading exist.
- The following database preparations have been made:
  - The correct version of Oracle is installed. See "Important Information for System Administrators".
  - The database character set is correct. See "Oracle Database Character Sets".
  - The Portal user `pin` has CREATE TABLE and CREATE SEQUENCE privileges. See "Granting New Privileges to the Oracle Portal User".
  - The required rollback segments exist. See "Setting Up Rollback Segments and Temporary Tablespaces".

The `-s` parameter also reports how much disk space is required for event table partitioning.

Results are printed to the `/Portal_Home/upgrade/gsm/10_20/sqllog/pre_upg_sanity_chk2.sql.log` file. For more information, see "About the `upg_mgr.pl` Script".

---

### Table 20–1 (Cont.) upgrade.cfg Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>$UPGRADE_LOG_DIR</code></td>
<td>Specifies in which directory to create the log and pinlog files generated by the upgrade process.</td>
</tr>
</tbody>
</table>
| `$UPG_DATA_START_TIME` | Specifies the start date for upgrading only the most recent data. Only objects created during the time period defined by `$UPG_DATA_START_TIME` and `$UPG_DATA_END_TIME` are upgraded. An object's created time is used to calculate the age of its data. Note:  
  - This parameter applies only to event, item, bill, and ledger_report objects. The remainder of the Portal database is fully upgraded.  
  - If you specify only a date, the default time is 00:00:00 on the specified date. Therefore, the start date is inclusive.  
  - To upgrade all the data in your database, specify a date range that covers all the data. To find the entire range, run the `upg_mgr.pl` script with the `-t` parameter. |
| `$UPG_DATA_END_TIME` | Specifies the end date for upgrading only the most recent data. Important: You must change the default value of this parameter. Note: If you specify only a date, the default time is 00:00:00 on the specified date. Therefore, the end date is exclusive. For more information, see `$UPG_DATA_START_TIME`. |
Generating a List of Tables and Indexes in the 2.0 Schema

To see what modifications you made to the default Release 1.0 database schema, compare the tables and indexes in your 1.0 database with those in the default 1.0 database. You need this information to interpret error messages that might be generated when you run the upgrade scripts (see "Running the Database Upgrade Scripts") and when you add custom tables and indexes to the upgraded Release 2.0 database.

Generating Your 2.0 Tables List

The `schema_tbls.sql` script generates a list of your Release 2.0 database table columns and writes it to the `table_schema.out` file.

Run the `schema_tbls.sql` script from the UNIX or DOS command prompt:

```
% cd Portal_Home/upgrade/gsm/10_20
% perl upg_mgr.pl -e schema_tbls.sql
```

Generating 2.0 Index List

The `schema_idxs.sql` script generates a list of your Release 1.0 database indexes and writes it to the `index_schema.out` file.

Run the `schema_idxs.sql` script from the UNIX or DOS command prompt:

```
% cd Portal_Home/upgrade/gsm/10_20
% perl upg_mgr.pl -e schema_idxs.sql
```

Running the Database Upgrade Scripts

The `upgrade.pl` script runs a series of scripts that upgrade the Release 1.0 database to Release 2.0. By default, the `upgrade.pl` script runs all the upgrade scripts.

To run only the offline scripts, you must first edit the `upgrade.cfg` file. See "Configuring the Upgrade Parameters".

For more information about the `upgrade.pl` script, see "About the Upgrade.pl Script".

To upgrade your database schema:

1. Run the `upgrade.pl` script from the UNIX or DOS command prompt:

```
% cd Portal_Home/upgrade/gsm/10_20
% perl upgrade.pl
```

2. Check each script’s log and pinlog file in the directory specified by the `UPGRADE_LOG_DIR` parameter in your `upgrade.cfg` file (by default, `Portal_Home/upgrade/gsm/10_20/sqllog`). These log files show how long each script took to execute and list any errors that occurred.

   **Important:** If any errors are reported, fix them, and then rerun the `upgrade.pl` script.
Installing Patch 4489

You must install Patch 4489. This patch is critical to the proper performance of GSM Manager. For more information, see the patch README file.

Running pin_setup to Configure GSM Manager

The pin_setup script reads the pin_setup.values file and configures Portal by initializing the database, configuring various pin.conf files, and starting various servers, including the dm_oracle server, the Connection Manager (CM), and the Java server.

To run the pin_setup script:

1. Log in as user pin, go to the Portal_Home/setup directory, and run the pin_setup script:

   % su - pin
   % cd Portal_Home/setup
   % ./pin_setup

2. Check the following files for errors:
   - Portal_Home/setup/pin_setup.log
   - Portal_Home/sys/cm/CM.log
   - Portal_Home/var/cm/cm.pinlog
   - Portal_Home/sys/dm_database/DM.log
   - Portal_Home/var/dm_database/dm_database.pinlog

Restoring Service Authentication

See “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.

Dropping Obsolete Database Objects from the Database

Perform it after you verify that the upgrade is successful.

To drop obsolete database tables and columns, run the drop_tables.sql script from the UNIX or DOS command prompt:

   % cd Portal_Home/upgrade/gsm/10_20
   % perl upgrade.pl drop_tables.sql

Command-Line Scripts

The following command-line scripts automate routine upgrade tasks:

- About the upg_mgr.pl Script
- About the Upgrade.pl Script

Run these scripts from the UNIX or DOS prompt.

About the upg_mgr.pl Script

This Perl script performs many of the upgrade tasks, such as creating database objects and running sanity checks.
Command-Line Scripts

Syntax

perl upg_mgr.pl -o | -s | -e sql_script_name.sql | -r step_name | -d step_name | -t | -n | -h

Note:

- Specify only one parameter at a time.
- Run upg_mgr.pl with the -o parameter before you run it with any other parameters.
- If you omit sql_script_name after the -e parameter or step_name after the -r or -d parameters, the script does nothing.

Parameters

Table 20–2 describes the upg_mgr.pl parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| -o        | Creates the database objects required for the upgrade. **Important:** Run upg_mgr.pl with the -o parameter before you run it with any other parameters. This parameter performs these operations:  
- Creates the UPG_LOG_T table that logs all the information about the upgrade.  
- Creates the pin_upg_common package that contains all the common routines for the upgrade. |
| -s        | Runs the pre-upgrade sanity check. See “Performing Pre-Upgrade Sanity Checks”. **Note:** This requires a database administrator (DBA) user name and password for the Portal database. See the upgrade.cfg file for details. |
| -e sql_script_name.sql | Executes the specified SQL script against the Portal schema. It replaces all the Perl variables before running the script. **Important:** You must include the .sql extension with the script name. |
| -r step_name | Prints a report of the status of the specified step and directs the report to the Portal_Home/upgrade/gsm/10_20/sqllog/step_name.sqlpinlog file. **Important:** Do not include the file extension with the script name. |
| -d step_name | Deletes all the information related to an upgrade script from the upgrade log tables. After a script is run, its completion is logged in the upgrade log tables. If a user tries to rerun the script, the upgrade software first checks those tables. When it finds the script has already run, it skips the script. Thus, you must run upg_mgr.pl -d to delete all information about a previously run script from the tables before rerunning the script. **Important:** Do not include the file extension with the script name. |
| -t        | Displays the maximum and minimum CREATED_T for the EVENT_T, ITEM_T, and BILL_T tables. |
| -h        | Displays these parameter descriptions. |

About the Upgrade.pl Script

The upgrade.pl Perl script is the main upgrade script. It runs many other SQL scripts in the correct order.
To run all the scripts listed in the upgrade.cfg file's @ALL_SCRIPTS parameter, enter this command at the UNIX or DOS prompt:

```bash
% cd Portal_Home/upgrade/gsm/10_20
% perl upgrade.pl
```

**Note:** The scripts are run in the order they are listed in the parameter. For more information, see "Configuring the Upgrade Parameters".

To run a single script, enter this command:

```bash
% cd Portal_Home/upgrade/gsm/10_20
% perl upgrade.pl script_name
```

**Important:** `script_name` must include the file extension.

### About the Upgrade Scripts and Files

This section describes the scripts and files used to upgrade your Portal database.

#### Offline Scripts

Table 20–3 describes the offline scripts.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin_upg_common.sql</td>
<td>SQL script that creates the common routines needed for the upgrade.</td>
</tr>
<tr>
<td>add_new_tables_20.sql</td>
<td>SQL script that adds the new Release 2.0 tables.</td>
</tr>
<tr>
<td>add_new_indexes_20.sql</td>
<td>SQL script that adds the new Release 2.0 indexes.</td>
</tr>
</tbody>
</table>

#### Online Scripts

Table 20–4 describes the online scripts.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>update_event_service.sql</td>
<td>SQL script that updates EVENT_T and SERVICE_T to reflect the TCF changes.</td>
</tr>
<tr>
<td>drop_tables.sql</td>
<td>SQL script that drops the obsolete tables, which are not required in the new version.</td>
</tr>
</tbody>
</table>

#### Miscellaneous Scripts and Files

The following scripts are configuration files executed by offline or online scripts.
Part VI

Upgrading Revenue Assurance Manager

This part contains information on how to upgrade the Revenue Assurance Manager.

Part VI contains the following chapter:

- Upgrading from Revenue Assurance Manager Release 2.0 to Release 3.0
Upgrading from Revenue Assurance Manager Release 2.0 to Release 3.0

This document contains procedures for upgrading your Portal™ Revenue Assurance Manager system directly from Release 2.0 to Release 3.0. It covers Oracle on both HP-UX and Solaris platforms.

**Important:** Before performing the tasks in this document, verify that you have Revenue Assurance Manager 2.0 installed.

For information on installing Revenue Assurance Manager, see “Installing Revenue Assurance Manager” in BRM Collecting Revenue Assurance Data.

**Note:** You need to upgrade Revenue Assurance Manager Release 2.0 to Release 3.0 only if you are upgrading from Infranet Release 6.5 to Portal 7.3.

### Preparing Your Environment for the Upgrade

Before upgrading to Revenue Assurance Manager 3.0, prepare your database.

### Upgrading the Oracle Software and Database

You can use Revenue Assurance Manager 3.0 only with Oracle 9i or 10g.

**Caution:** If you are using an earlier version of Oracle, you must upgrade it before you install Revenue Assurance Manager 3.0. For information on upgrading Oracle, see your Oracle documentation.

### Upgrading the Portal Database for Revenue Assurance Manager 3.0

This section describes how to upgrade the Portal database to support Revenue Assurance Manager 3.0.

1. Backing Up Revenue Assurance Manager 2.0 Files
2. Loading Release 2.0 Batch Rating Data
3. Shutting Down Portal
4. Backing Up Your Portal Database
5. Installing the Third-Party Software
6. Installing Revenue Assurance Manager Server 3.0
7. Installing the Upgrade Scripts
8. Configuring the Upgrade Parameters
9. Creating Required Database Objects and the Upgrade Log Directory
10. Performing Pre-Upgrade Sanity Checks
11. Running the Database Upgrade Scripts
12. Running pin_setup to Configure Revenue Assurance Manager
13. Restoring Service Authentication
14. Dropping Obsolete Database Objects from the Database

**Backing Up Revenue Assurance Manager 2.0 Files**

Before removing the old Revenue Assurance Manager Release 2.0 software, back up your 2.0 files.

---

**Important:** In particular, make sure you back up customized source code, pin.conf, and pin_setup.values files.

---

**Loading Release 2.0 Batch Rating Data**

Pipeline Rating Engine does not directly load revenue assurance data into the database, but rather creates data files that are loaded by using Universal Event (UE) Loader. Typically, this is triggered automatically by the Batch Controller. You must complete loading all the Release 2.0 data files before upgrading to Release 3.0. The UE Loader templates delivered with Release 3.0 will not work with data files created with Release 2.0.

To make sure all the Release 2.0 data is loaded:

1. Stop the pipeline.
2. If UE Loader is automatically triggered, wait until all files are processed. If you run UE Loader manually, run it with all unprocessed data files.

**Shutting Down Portal**

Only the database instance should be running during the upgrade. For more information, see “Starting and Stopping the BRM System” in BRM System Administrator’s Guide.

1. Stop all Portal processes.
2. Make sure the Connection Manager (CM) and Data Manager (DM) are not running.
3. Make sure no users are logged on to Portal.

Users include customers, client applications, customer service representatives (CSRs), and so on.
Back up Your Portal Database

Make a complete offline backup of your Portal database, and make sure the backup is completely valid and usable. For more information on performing full database backups, see your database software documentation.

In addition to the backup, use the Oracle export utility to export all Portal tables. This helps you restore individual tables if necessary.

Installing the Third-Party Software

Install the Third-Party software by following the instructions given in “Installing the Third-Party software” in BRM Installation Guide.

Installing Revenue Assurance Manager Server 3.0

The upgrade adds or replaces several libraries, UE Loader templates, and iScripts. It also updates the database schema and the Portal data dictionary.

1. Install the Revenue Assurance Manager server 3.0 package for your platform. Follow the instructions in “Installing Revenue Assurance Manager” in BRM Collecting Revenue Assurance Data.

Caution: Do not run the pin_setup script before upgrading your database. Running pin_setup before upgrading your database might corrupt your data.

Important:

- Pay particular attention to entries that specify your installation directory; CM and DM port numbers; and database host name, user name, and password.
- Make sure the $SETUP_INIT_DB entry is set to YES.
- Make sure the $SETUP_DROP_ALL_TABLES entry is set to NO.
- Make sure the $SETUP_CONFIGURE entry is set to YES.
- Make sure the $CREATE_DATABASE_TABLES entry is set to NO.

2. Make a backup copy of the pin_setup.values file (Portal_Home/setup/pin_setup.values file) and save it to another location.

Important: The upgrade scripts do not modify these files.

Installing the Upgrade Scripts

To install the Revenue Assurance Manager-Release-2.0-to-Release-3.0 upgrade scripts:

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

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

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

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

Bash shell:

source source.me.sh

C shell:

source source.me.csh

3. Log in as user integrate, go to the temp_dir directory, and enter this command:

7.3.1_RevAssuranceMgr_20_30_OraUpg_platform_32_opt.bin

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

4. Follow the instructions displayed during installation.

Configuring the Upgrade Parameters

The upgrade.cfg file contains your upgrade parameters, such as which scripts to execute and whether to upgrade only the most recent data. You should customize these parameters to meet your business requirements.

To edit the upgrade.cfg file:

1. Log in as user pin, go to Portal_Home/upgrade/ara/20_30, and open the upgrade.cfg file in a text editor such as vi:

   % su - pin
   % cd Portal_Home/upgrade/ara/20_30
   % vi upgrade.cfg

2. Go to Portal_Home/upgrade/ara/20_30, and open the upgrade.cfg file.

3. Configure the file’s parameters as necessary. For information on each parameter, see the comments in the upgrade.cfg file.
Table 21–1 describes the upgrade.cfg parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQLPLUS</td>
<td>Specify the location of the database utilities and executables. By default, they are set to sqlplus, imp, and exp, respectively.</td>
</tr>
<tr>
<td>IMP</td>
<td></td>
</tr>
<tr>
<td>EXP</td>
<td></td>
</tr>
<tr>
<td>OWNER</td>
<td>Specifies the Portal database user name. By default, this is set to pin.</td>
</tr>
<tr>
<td>PASSWD</td>
<td>Specifies the Portal database password. By default, this is set to pin.</td>
</tr>
<tr>
<td>DBNAME</td>
<td>Specifies the name of the Portal database you are upgrading. By default, this is set to pindbdb.</td>
</tr>
<tr>
<td>PIN_CONF_TBLSPACE1</td>
<td>Specify the tablespaces where your new tables and indexes will be created.</td>
</tr>
<tr>
<td>PIN_CONF_TBLSPACE2</td>
<td></td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_SMALL</td>
<td>Specify the storage parameters to use when the tables and indexes are created.</td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_SMALL_INS</td>
<td></td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_MED</td>
<td>Note: Information on how your tablespace and storage parameters are configured in Release 2.0 is in your Release 3.0 Portal_home/setup/scripts/pin_tables.values file. You can use this information to help you configure the parameters in your Release 3.0 upgrade.cfg file.</td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_MED_INS</td>
<td></td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_LARGE</td>
<td></td>
</tr>
<tr>
<td>PIN_CONF_STORAGE_LARGE_INS</td>
<td></td>
</tr>
<tr>
<td>@ALL SCRIPTS</td>
<td>Specifies which upgrade scripts are executed by the upgrade.pl script.</td>
</tr>
<tr>
<td>UPGRADE_LOG_DIR</td>
<td>Specifies in which directory to create the log and pinlog files generated by the upgrade process.</td>
</tr>
<tr>
<td>DB_DBA_USER</td>
<td>Specifies the user name with DBA privileges. By default, the user name is system. The user name and password are required to perform the pre-upgrade sanity checks of the database.</td>
</tr>
<tr>
<td>DB_DBA_PASSWD</td>
<td>Specifies the password of the DB_DBA_USER. By default, the password is manager.</td>
</tr>
</tbody>
</table>

Creating Required Database Objects and the Upgrade Log Directory

To create the database objects required for the upgrade and the upgrade log directory, run the upg_mgr.pl script with the -o parameter. For more information, see "About the upg_mgr.pl Script".

Performing Pre-Upgrade Sanity Checks

Run the upg_mgr.pl script with the -s parameter to verify the following:

- The indexes required for upgrading have been created.
- Portal storable class objects required for upgrading exist.
- The following database preparations have been made:
  - The correct version of Oracle is installed.
  - The database character set is correct.
  - The Portal user pin has CREATE TABLE and CREATE SEQUENCE privileges.
  - The required rollback segments exist.
Running the Database Upgrade Scripts

The upgrade.pl script runs a series of scripts that upgrade the Release 2.0 tables to Release 3.0. By default, the upgrade.pl script runs all the upgrade scripts.

To run only the offline scripts, you must first edit the upgrade.cfg file. See "Configuring the Upgrade Parameters".

For more information about the upgrade.pl script, see "About the upgrade.pl Script".

For information on offline scripts, see "Offline Scripts".

To upgrade your database schema:

1. Run the upgrade.pl script from the UNIX command prompt:
   ```
   % cd Portal_Home/upgrade/ara/20_30
   % perl upgrade.pl
   ```

2. Check each script's log and pinlog file in the directory specified by the UPGRADE_LOG_DIR parameter in your upgrade.cfg file (Portal_Home/upgrade/ara/20_30/sqllog).

   Important: If any errors are reported, fix them, and then rerun the upgrade.pl script.

Running pin_setup to Configure Revenue Assurance Manager

The pin_setup script reads the pin_setup.values file and configures Portal by initializing the database, configuring various pin.conf files, and starting various servers, including the dm_oracle server, the Connection Manager (CM), and the Java server.

To run the pin_setup script:

1. Add customizations from your backed-up Revenue Assurance Manager 2.0 pin_setup.values file to the Revenue Assurance Manager Portal_Home/setup/pin_setup.values file.

2. Log in as user pin, go to the Portal_Home/setup directory, and run the pin_setup script:
   ```
   % su - pin
   % cd Portal_Home/setup
   % ./pin_setup
   ```

3. Check the following files for errors:
   - Portal_Home/setup/pin_setup.log
   - Portal_Home/var/cm/cm.pinlog
   - Portal_Home/var/cm/cm.log
Restoring Service Authentication

See “Using the Authentication and Authorization Modules” in BRM RADIUS Manager.

Dropping Obsolete Database Objects from the Database

Perform this step after you verify that the upgrade is successful.

To drop obsolete database tables and columns, run the drop_old_tables.sql script from the command prompt:

```
% cd Portal_Home/upgrade/ara/20_30
% perl upg_mgr.pl -e drop_old_tables.sql
```

Updating the Revenue Assurance Configuration

Follow these steps to update the Revenue Assurance configuration:

1. Updating to Revenue Assurance Manager Release 3.0 Scenarios
2. Changing the Constraint on the IFW_AGGREGATION Table
3. Loading Release 3.0 Scenarios
4. Loading New UE Loader Templates into the Portal Database
5. Updating All the Control Points to Collect Batch Processing Timestamps
6. Changing the Date Format to Collect Call Processing Start and End Timestamps
7. Updating the Pipeline Registry to Track iScript File Name Changes
8. Updating the CollectProcessAuditForIREL Trigger with the New SQL Script
9. (Optional) Tracking Changes in /process_audit/billing Objects
10. (Optional) Changing Custom Revenue Assurance Aggregation Scenarios

Updating to Revenue Assurance Manager Release 3.0 Scenarios

Revenue Assurance Manager Release 3.0 scenarios collect more data from the pipeline than was collected by Release 2.0. The existing scenarios of Revenue Assurance Manager Release 2.0 must be dropped from the pipeline database by using Pricing Center, and the new scenarios must be loaded by using the SQL scripts (RevenueAssurance_Scenarios.sql).

To drop the Release 2.0 scenarios:

1. Start Pricing Center.
2. Choose View - Pipeline ToolBox - Aggregation - Scenarios.
   There will be Revenue Assurance Manager Release 2.0 sample scenarios from RA_01 to RA_14 and maybe some custom scenarios also.
3. Select all the scenarios and delete them.
4. Choose View - Pipeline Setup ToolBox - EDR - EDR container Description.
5. Select RA_SAMPLE.
6. Click Edit.
7. Click the **EDR Container Field** tab.

8. Select all the field details and delete them.

9. Choose **View - Pipeline Setup ToolBox - EDR - EDR container Description**.

10. Select **RA_SAMPLE** and delete it.

11. Exit Pricing Center.

### Changing the Constraint on the IFW_AGGREGATION Table

You must change the **CKC_AGG_FUNCTION** constraint before running the SQL script to load the new scenarios. To disable the constraint, run the SQL script `update_v6.7.4_v6.7.5.sql` on the pipeline database.

### Loading Release 3.0 Scenarios

To use the sample scenarios, you need to load them into the pipeline database.

To load the sample scenarios into a pipeline database, run the following commands against the pipeline database from the

`IFW_Home/database/Oracle/Scripts` directory:

```
sqlplus user/password@database RevenueAssurance_scenario.sql
```

where `user` is the pipeline user ID, `password` is the pipeline user password, and `database` is the pipeline database alias.

### Loading New UE Loader Templates into the Portal Database

Upgrading copies the new UE Loader Template XML files into the installation directory, but you manually have to load them into the Portal database by using `pin_uei_deploy` utility. Before loading the new UE Loader templates, you must delete the old templates.

To delete the old UE Loader templates:

1. Go to the `Portal_Home/apps/uel/Revenue_Assurance` directory.

2. Run the following commands to delete the old templates:

```
pin_uei_deploy -t RA01 -d
pin_uei_deploy -t RA02 -d
pin_uei_deploy -t RA03 -d
pin_uei_deploy -t RA04 -d
pin_uei_deploy -t RA05 -d
pin_uei_deploy -t RA06 -d
pin_uei_deploy -t RA07 -d
pin_uei_deploy -t RA08 -d
pin_uei_deploy -t RA09 -d
pin_uei_deploy -t RA10 -d
pin_uei_deploy -t RA11 -d
pin_uei_deploy -t RA12 -d
pin_uei_deploy -t RA13 -d
```

3. Load the new UE Loader templates by running following commands:

```
pin_uei_deploy -c -t RA01 -i BRM_Home/apps/uel/Revenue_Assurance/RA01.xml
pin_uei_deploy -c -t RA02 -i BRM_Home/apps/uel/Revenue_Assurance/RA02.xml
pin_uei_deploy -c -t RA03 -i BRM_Home/apps/uel/Revenue_Assurance/RA03.xml
pin_uei_deploy -c -t RA04 -i BRM_Home/apps/uel/Revenue_Assurance/RA04.xml
```
Updating the Revenue Assurance Configuration

Upgrading from Revenue Assurance Manager Release 2.0 to Release 3.0

Updating All the Control Points to Collect Batch Processing Timestamps

All the control points in Revenue Assurance Manager Release 3.0 must include the following registry entry:

```
IncludeProcessingTimestamps = TRUE
```

The following is a sample registry section for a control point in Revenue Assurance Manager Release 3.0:

```
{
    ModuleName = FCT_Aggregate
    Module
    {
        Active = TRUE
        ScenarioReaderModuleName = ifw.DataPool.ScenarioReader
        Scenarios
        {
            BatchStat
            {
                TempDir = result/temp
                DoneDir = result/done
                CtlDir = result/ctl
                FieldDelimiter = ;
                FlushMode = 0
                ControlPointId = CP_PreRatingBatchStat
                IncludeProcessingTimestamps = TRUE
            }
        }
        ResultFile
        {
            TempSuffix = .tmp
            DoneSuffix = .dat
            WriteEmptyFile = FALSE
        }
        ControlFile
        {
            Suffix = .ctl
            DataFilePath = TRUE
        }
    }
}
```

Changing the Date Format to Collect Call Processing Start and End Timestamps

You must change the date format field in the UE Loader Infranet.properties file to collect call processing and start and end timestamps.

To change the date format:
   The infranet.uel.date_pattern field has the following date/time format:
   infranet.uel.date_pattern=dd/MM/yyyy:hh:mm:ss a zzzz

2. Change the date/time format to:
   infranet.uel.date_pattern=yyyyMMddHHmmss

**Updating the Pipeline Registry to Track iScript File Name Changes**

The iScript file named ISC_SetDiscountValue.isc in Release 2.0 has been renamed to ISC_SetRevenueFigures.isc in Release 3.0.

To update the pipeline registry, in the pipeline registry sections for modules that use this iScript file, change the FileName entry to the new iScript name.

---

**Note:** In Release 2.0, if you have set control point to collect revenue assurance data only on Retail charged amount, the iScript ISC_PostRating.isc was used to collect charging amount (there was no dependency on the iScript ISC_SetDiscountValue.isc). In Release 3.0, the iScript ISC_SetRevenueFigures.isc collects both Retail charged amount and discount and uses the iScript ISC_FCTBillingRecord.isc. So the control point that you have set to collect only charged amount must be moved after the iScript ISC_SetRevenueFigures.isc below the iScript ISC_FCT_BillingRecord.isc to collect only charged amount.

---

**Updating the CollectProcessAuditForIREL Trigger with the New SQL Script**

The updated trigger provided with Revenue Assurance Manager Release 3.0 is more refined and differentiates between rerating and recycling batches.

To update the trigger:

1. Go to the Portal_Home/sys/data/config directory.
2. Run the following command:
   ```
   sqlplus login/password@$ORACLE_SID @CollectProcessAuditForIREL.sql
   ```
   where ORACLE_SID is the Portal database alias.

**(Optional) Tracking Changes in /process_audit/billing Objects**

---

**Note:** It is unlikely that any action is required, but this step is included for completeness.

---

All changes to Portal objects for revenue assurance between Release 2.0 and Release 3.0 are additive changes except for one of the changes to the object /process_audit/billing. In Release 2.0, this object has a single PIN_FLD_FAILED_ACCOUNTS array. In Release 3.0, this is a nested array within the PIN_FLD_BILLING_SEGMENTS array. Database reports that read this array don’t need to be changed. The name of the table for this array has not changed, and the report will work as it did in Release 2.0. However, any custom applications that read a /process_audit/billing record through the PCM (or Java PCM) interface need to be modified because the array has been
moved. Also, the PIN_FIELD_BILL_SUPPRESSION and PIN_FIELD_REVENUE arrays are added in Release 3.0.

(Optional) Changing Custom Revenue Assurance Aggregation Scenarios

**Note:** This step applies only if you have added custom aggregation scenarios for Release 2.0.

If you have custom aggregation scenarios for revenue assurance, following this step ensures that all Release 3.0 features will work correctly on the data produced by these scenarios. All Release 2.0 features will continue working with the data produced by custom scenarios, even if this step is not followed.

Release 3.0 contains new support for auditing the rerating process in the pipeline. In Release 3.0, distinct batch types are recorded for recycling and rerating. Also, when CDRs are suspended and recycled during rerating, Release 3.0 can record more relationships among the batches. It records relationships between the recycling batch and the rerating batches from which they were suspended, and also the relationships between the recycling batches and the batches in which the CDRs were first processed.

To record this information, aggregation scenarios must read an additional field from EDR container, and the UE Loader templates for loading the data must pass this additional field to the Portal opcode that creates the `/process_audit` objects. The scenarios and their corresponding UE Loader templates have been updated. Similar changes need to be made in any custom scenarios to enable these Release 3.0 features. The changes are:

- In the aggregation scenarios, the EDR container fields that group data must include DETAIL.ASS_SUSPENSE_EXT.SUSPENDED_FROM_BATCH_ID and the order for these grouping fields must be DETAIL.BATCH_ID, DETAIL.ORIGINAL_BATCH_ID, DETAIL.ASS_SUSPENSE_EXT.SUSPENDED_FROM_BATCH_ID.
- The corresponding UE Loader templates load this additional fields, by including it on the input flist to `PCM_OP_PROCESS_AUDIT_CREATE_AND_LINK` (or `PCM_OP_PROCESS_AUDIT_CREATE`). The field on the input flist for this value is `PIN_FLD_GROUP_DETAILS.PIN_FLD_SUSPENDED_FROM_BATCH_ID`.

Command-Line Scripts

The following command-line scripts automate routine upgrade tasks:

- About the `upg_mgr.pl` Script
- About the `upgrade.pl` Script

Run these scripts from the UNIX prompt.

About the `upg_mgr.pl` Script

This Perl script performs many of the upgrade tasks, such as creating database objects and running sanity checks.

**Syntax**

```
perl upg_mgr.pl -o | -s
```
**Note:**

- Specify only one parameter at a time.
- Run `upg_mgr.pl` with the `-o` parameter *before* you run it with `-s` parameter.

---

**Parameters**

Table 21–2 describes the parameters in `upg_mgr.pl`.

### Table 21–2 Parameters in upg_mgr.pl

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| `-o`      | Creates the database objects required for the upgrade.  
**Important:** Run `upg_mgr.pl` with the `-o` parameter *before* you run it with any other parameter.  
This parameter performs these operations:  
- Creates the UPG_LOG_T table that logs all the information about the upgrade.  
- Creates the `pin_upg_common` package that contains all the common routines for the upgrade. |
| `-s`      | Runs the pre-upgrade sanity check. See "Performing Pre-Upgrade Sanity Checks".  
**Note:** This requires a database administrator (DBA) user name and password for the Portal database. See the `upgrade.cfg` file for details. |

---

**About the upgrade.pl Script**

The `upgrade.pl` Perl script is the main upgrade script. It runs many other SQL scripts in the correct order.

To run all the scripts listed in the `upgrade.cfg` file's `@ALL_SCRIPTS` parameter, enter this command at the UNIX prompt:

```
% cd Portal_Home/upgrade/ara/20_30
% perl upgrade.pl
```

**Note:** The scripts are run in the order they are listed in the parameter. For more information, see "Configuring the Upgrade Parameters".

---

**About the Upgrade Scripts and Files**

This section describes the scripts and files used to upgrade your Revenue Assurance Manager Release 2.0 database to Release 3.0.

**Offline Scripts**

Table 21–3 describes the scripts and files that you should run offline (while Portal is shut down) and finish running before Portal is restarted.

### Table 21–3 Parameters in upg_mgr.pl

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>pin_upg_common.sql</code></td>
<td>SQL script that creates the common routines needed for the upgrade.</td>
</tr>
</tbody>
</table>
Table 21–3 (Cont.) Parameters in upg_mgr.pl

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>create_tmp_proc_aud.sql</td>
<td>SQL script that creates temporary audit PROC_AUD_BILL_ERR_ACCT tables.</td>
</tr>
</tbody>
</table>

Miscellaneous Scripts and Files

Table 21–4 describes the scripts are configuration files executed by offline scripts.

Table 21–4  Scripts and configuration Files Executed by Offline Scripts

<table>
<thead>
<tr>
<th>Script or File</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>drop_old_tables.sql</td>
<td>SQL script that drops obsolete database tables and columns.</td>
</tr>
<tr>
<td>pre_upg_sanity_chk1.sql</td>
<td>SQL scripts that perform sanity checks before the upgrade starts.</td>
</tr>
<tr>
<td>pre_upg_sanity_chk2.sql</td>
<td></td>
</tr>
<tr>
<td>crt_pinlog.sql</td>
<td>SQL script that creates the pinlog files.</td>
</tr>
<tr>
<td>pin_pre_cmp_araframework.pl</td>
<td>Perl script that configures the araframework component.</td>
</tr>
<tr>
<td>upgrade.cfg</td>
<td>Configuration file in which you must enter details about the Oracle database configuration before you run the upgrade scripts. All the upgrade Perl scripts parse this file to get the database connection parameters.</td>
</tr>
<tr>
<td>upg_oracle_functions.pl</td>
<td>Perl script that performs many miscellaneous upgrade tasks related to the Oracle database.</td>
</tr>
<tr>
<td>upg_mgr.pl</td>
<td>Perl script that manages many miscellaneous upgrade tasks.</td>
</tr>
<tr>
<td>upgrade.pl</td>
<td>Master Perl script for the upgrade process. This Perl script calls other SQL scripts to perform the upgrade.</td>
</tr>
<tr>
<td>20_30_upg_araframework.source</td>
<td>Flist that loads the new tables and columns.</td>
</tr>
<tr>
<td>20_30_default_values.sql</td>
<td>SQL script that loads the default values.</td>
</tr>
</tbody>
</table>
Part VII
Migrating Discount Data

This part contains information on how to upgrade and migrate your discount data.

Part VII contains the following chapter:

- Understanding and Migrating Discount Data
Understanding and Migrating Discount Data

This document provides an overview of Portal™ Discount Data Migration. It describes the process of migrating and upgrading discount and rollover data from the Pipeline Rating Engine 6.5 database to the Portal 7.3 database. In addition, this document provides reference information on Discount Data Migration utilities.

**Note:** You need to migrate discount data only if you are upgrading from Infranet Release 6.5 to Portal 7.3.

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

- Portal opcodes and flists. See “Understanding flists and Storable Classes” in BRM Developer’s Guide.

You should also have detailed knowledge of the following areas:

- A thorough understanding of the Portal database and the Pipeline Manager database.
- Sufficient programming skills to use Portal utilities and opcodes.
- XML and XSLT formats.

**About Discount Data Migration**

When you upgrade from Infranet Release 6.5 to Portal 7.3, you must migrate discount data to the Portal 7.3 database to use the new discounting features. Discount data migration is required because of changes to the discount architecture, pricing model, balance structure, and discount data storage location in Portal 7.3.

In Infranet Release 6.5, discount information is stored as a part of your rate plans in the Pipeline Rating Engine database. In Portal 7.3, discount data is stored as separate discount objects in the Portal database. You then associate discounts with deals that your customers can purchase.

For more information on the differences between the 6.5 and 7.3 discounting architecture, see "Discounting Differences Between Infranet 6.5 and Portal 7.3".

Discount Data Migration provides a set of utilities to migrate discount data to the Portal 7.3 database based on the configuration settings you specify.

You must migrate the following types of discount data:
 Discounting Differences Between Infranet 6.5 and Portal 7.3

Discount configuration data - Data used to configure a discount model, such as discount model codes, discount masters, discount triggers, discount rules, discount steps, discount conditions, discount balance impacts, resources, and rollover data.

Subscription mapping data - Data used to manage customer discounts, such as rate plan names, deal names (for deals containing discount and rollover products), and the service types linked to the rate plans and discount model codes.

Discount balance data - Data used to update the customer’s discount balance information, such as discount balances, rollover resources, and aggregation counters.

Table 22–1 describes the differences between discounting in Infranet 6.5 and Portal 7.3:

<table>
<thead>
<tr>
<th>6.5 Discounting</th>
<th>7.3 Discounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discounts are part of Pipeline Rating Engine rate plans. They can be purchased only by purchasing rate plans.</td>
<td>Discounts are defined in separate objects called discount objects, which are stored in the Portal database.</td>
</tr>
<tr>
<td>Discount configurations are stored only in the Pipeline Rating Engine database in the form of discount models, discount rules, discount triggers, and discount masters.</td>
<td>The discount model code of the discount object is stored in the Portal database. All other discount information such as discount configuration data (discount master, discount rules, discount triggers, and so on) are stored in the Pipeline Manager database.</td>
</tr>
<tr>
<td>Supports discount processing by the batch pipeline only.</td>
<td>Supports discount processing by both real-time and batch pipelines.</td>
</tr>
<tr>
<td>Discount balance information is maintained by the DAT_Discount module.</td>
<td>Discount balance information is maintained by the DAT_BalanceBatch or DAT_BalanceRealtime modules.</td>
</tr>
<tr>
<td>Discount balance information is stored in the discount work files in the Pipeline Manager database in the location specified in the Pipeline Manager registry file.</td>
<td>Discount balance information is stored in the Portal database and updated using Rated Event (RE) Loader.</td>
</tr>
<tr>
<td>Discount balance is read from files when Pipeline Manager starts. Pipeline Manager processes all events queued in the Portal database.</td>
<td>Discount balance is read from the Portal database when Pipeline Manager starts and then processes the events.</td>
</tr>
<tr>
<td>Does not support discount balance impact.</td>
<td>Supports discount balance impact (including currency and non-currency impacts), a new pricing component.</td>
</tr>
<tr>
<td>Supports discount rollovers only for balances.</td>
<td>Supports system-wide rollovers as well as Pipeline Manager rollovers.</td>
</tr>
</tbody>
</table>
Discounting Differences Between Infranet 6.5 and Portal 7.3

<table>
<thead>
<tr>
<th>6.5 Discounting</th>
<th>7.3 Discounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events are mapped to discount models through discount bundles and discount owner ERAs.</td>
<td>Events are mapped to discount models through discount objects.</td>
</tr>
<tr>
<td>Supports Discount Bundle, Discount Owner, Discount Account, and Discount Model ERAs.</td>
<td>Supports only Discount Bundle and Discount Owner ERAs.</td>
</tr>
<tr>
<td>Discount triggers and discount rules contain discount masters.</td>
<td>Only discount rules contain discount masters.</td>
</tr>
<tr>
<td>Aggregation counters are not configurable and are automatically created when Pipeline Manager rating starts. Aggregation counters are stored in the discount work files.</td>
<td>Aggregation counters are configurable and stored in the Portal database.</td>
</tr>
<tr>
<td>Does not support discount sharing and sponsored accounts. Sponsored accounts cannot share discount resources.</td>
<td>Supports discount sharing where accounts that sponsor other accounts can share discount resources; for example, snowball discounting.</td>
</tr>
<tr>
<td>Supports only billing-time discounts.</td>
<td>Supports item, subscription, and system-wide discounts.</td>
</tr>
<tr>
<td>Supports complex discounting only for data usage.</td>
<td>Supports complex discounting for both voice and data usage.</td>
</tr>
<tr>
<td>Supports cascading and parallel mode discounting.</td>
<td>Supports cascading, parallel, and sequential mode discounting.</td>
</tr>
<tr>
<td>Does not support reverse discounts through billing time discount.</td>
<td>Supports reverse discounts through billing time discount.</td>
</tr>
<tr>
<td>Discount rules and discount trigger conditions are used to determine the balance impacts.</td>
<td>Expression tokens, which represent charge and quantity values in the charge packet, are used to define discount rules, conditions, and balance impacts in the new discount model.</td>
</tr>
<tr>
<td>Ratable Usage Metrics (RUMs) are used to measure events for discounting.</td>
<td>Discounting Ratable Usage Metrics (DRUMs) are used to measure events for discounting.</td>
</tr>
<tr>
<td>Discounting Ratable Usage Metrics (DRUMs) are not supported.</td>
<td>Discount rules contain three new fields-DRUM_EXPRESSION, DRUM_TYPE, and RULE_TYPE.</td>
</tr>
<tr>
<td>Discounting can be applied to delayed events.</td>
<td>Discounting can be applied to both real-time and delayed events.</td>
</tr>
<tr>
<td>Supports only one-time discounts and billing-time discounts.</td>
<td>Supports one-time, billing-time, threshold, and tier discounts.</td>
</tr>
</tbody>
</table>
Migrating Discount Data

The following section explains how to set up and use Portal™ utilities to migrate discount data, subscription mapping data, and balance data from the Pipeline Rating Engine 6.5 database to the Portal 7.3 database.

Before you read this document, you should be familiar with the following Portal concepts and architecture:

- About BRM
- BRM system architecture
- About Discount Data Migration
- About creating a price list

Overview of the Discount Data Migration Process

The discount data migration process consists of the following steps:

1. Upgrading your Portal database from Release 6.5 to Portal 7.3. See "Upgrading Your System to Portal 7.3".
2. Migrating data from your Pipeline 6.5 database to your upgraded Portal 7.3 database. See "Migrating Discount Data from the Pipeline 6.5 Database to the Portal 7.3 Database".
3. Upgrading your Pipeline database from Release 6.5 to Pipeline Manager 7.3. See "Upgrading Your System to Pipeline Manager 7.3".
4. Performing post-migration updates, such as updating cross-product discounts and creating system discounts. See "Performing Post-Migration Updates".

Upgrading Your System to Portal 7.3

If you have not already done so, upgrade your Portal database from Infranet Release 6.5 to Portal 7.3.

Migrating Discount Data from the Pipeline 6.5 Database to the Portal 7.3 Database

**Important:** You must upgrade your Portal database to Portal 7.3 before migrating your discount data.

You migrate discount data by extracting your data from the Pipeline Rating Engine Release 6.5 database and then loading it into your upgraded Portal 7.3 database.

To migrate your discount data, perform these steps:

1. Re-create your custom resource IDs on the Portal 7.3 database. See "Re-Creating Your Custom Resource IDs on the Portal 7.3 Database".
2. Retrieve the discount migration utility. See "Retrieving the Discount Migration Utility".
3. If your release 6.5 system includes multiple Pipeline Rating Engine service codes mapped to a single Infranet service type, modify the `discount.sql` file. See "Modifying Service Code Mappings".
4. Extract your discounting data from the Pipeline 6.5 database. See "Extracting Discount Data from the Pipeline 6.5 Database".
5. Load your discount configuration data into the Portal 7.3 database. See “Loading Discount Configuration Data into the Portal 7.3 Database”.

6. Retain your discount model ERAs from the Portal 6.5 database. See “Retaining Discount Model ERAs from Portal Release 6.5”.

7. Load your subscription mapping data into the Portal 7.3 database. See “Loading Subscription Mapping Data into the Portal 7.3 Database”.

8. Load your discount balance data into the Portal 7.3 database. See “Loading Discount Balance Data into the Portal 7.3 Database”.

Re-Creating Your Custom Resource IDs on the Portal 7.3 Database

The discount data migration scripts do not migrate custom resource IDs from your Pipeline 6.5 database to your Portal 7.3 database. If your system uses any custom resource IDs, you must manually re-create them in your upgraded Portal 7.3 database.

To re-create your custom resource IDs in the Portal 7.3 database:

1. Look up your existing resource IDs in your Pipeline Rating Engine 6.5 database:
   Use Pricing Center to connect to your Pipeline 6.5 database. In Pricing Center, launch Resource Editor and write down all custom resource IDs that you see.

   **Tip:** Custom resources use ID numbers 1000001 through 4000000000.

2. Manually re-create your custom resource IDs in your Portal 7.3 database:
   Use Pricing Center to connect to your Portal 7.3 database. In Pricing Center, launch Resource Editor and manually enter all of your custom resource IDs.

Retrieving the Discount Migration Utility

The utility that extracts discount data from your Pipeline 6.5 database is packaged with Pipeline Manager 7.3. Therefore, to retrieve the extraction utility, ${DMTDscntMig}$, you must install Pipeline Manager 7.3 on your pipeline system.

**Caution:** When you install Pipeline Manager 7.3, *DO NOT* set the Portal framework environment or configure the Pipeline database. Otherwise, you will overwrite your 6.5 discount data.

To retrieve the utility, perform the following on your Pipeline system:


2. Make a complete backup of your Pipeline Rating Engine 6.5 system.

3. Uninstall Pipeline Rating Engine 6.5.

4. Install Pipeline Manager 7.3 by following the instructions in “Installing Pipeline Manager” in *BRM Installation Guide*, but *DO NOT* set the Portal framework environment or configure the Pipeline database.

If installation completes successfully, the ${DMTDscntMig}$ utility is installed in *Pipeline_Home/BIN*, the library files are installed in *Pipeline_Home/LIB*, and the application files are installed in *Pipeline_Home/TOOLS/DMTDscntMig*.
Modifying Service Code Mappings

If your release 6.5 system includes multiple Pipeline Rating Engine service codes mapped to a single Infranet service type, the DMTDscntMig utility generates multiple discount objects for each product. For example, if the TEL, SMS, and DATA Pipeline Rating Engine service codes are mapped to the /service/telco/gsm Portal service type, DMTDscntMig generates the following three discount objects:

DECU2|Deal-dmDECU2-TEL|/service/telco/gsm|dmDECU2
DECU2|Deal-dmDECU2-SMS|/service/telco/gsm|dmDECU2
DECU2|Deal-dmDECU2-DATA|/service/telco/gsm|dmDECU2

For more information about service code mapping, see “Mapping Service Codes and Service Classes” in BRM Setting Up Pricing and Rating.

To generate only one discount object for each product, you must modify the discount.sql file before you extract data from your Pipeline 6.5 database. Modify the file to map a service type to only one service code.

To modify your service code mappings:

1. Open the Pipeline_Home/tools/DMTDscntMig/discount.sql file in a text editor.
2. Search for the following line:

   ```sql
   select unique TO_CHAR(h.VALID_FROM, 'YYYYMMDDHH24MISS') VALID_FROM, g.REF_PARAM, f.PIN_SERVICETYPE, f.SERVICECODE, e.RATEPLAN, (select CODE from ifw_rateplan where rateplan = e.rateplan)
   ```

3. Between f.PIN_SERVICETYPE and f.SERVICECODE, add the following DECODE statement:

   ```sql
   f.PIN_SERVICETYPE, DECODE(f.PIN_SERVICETYPE,'ServiceType', 'ServiceCode')
   ```

   where:
   - **ServiceType** is the Portal service type, such as /service/telco/gsm.
   - **ServiceCode** is the one Pipeline Rating Engine service code that ServiceType now maps to, such as TEL.

   For example, if the TEL, SMS, and DATA service codes are mapped to the /service/telco/gsm service type and the GPR, GPR2, and GPR3 service codes are mapped to the /service/ip/gprs service type, modify the file to map /service/telco/gsm to only TEL and to map /service/ip/gprs to only GPR. For this example, enter the DECODE statement shown in bold below:

   ```sql
   select unique TO_CHAR(h.VALID_FROM, 'YYYYMMDDHH24MISS') VALID_FROM, g.REF_PARAM, f.PIN_SERVICETYPE, DECODE(f.PIN_SERVICETYPE,'/service/telco/gsm', 'TEL', '/service/ip/gprs', 'GPR') f.SERVICECODE, e.RATEPLAN,
   ```

4. Save and close the file.
Extracting Discount Data from the Pipeline 6.5 Database

You extract data from your Pipeline database by using the DMTDscntMig utility. You configure how the utility connects to the Pipeline database and the name and location of the output files by using a registry file.

To extract the discounting data from your Pipeline Rating Engine 6.5 database, perform these steps on your Pipeline system:

1. Go to the Pipeline_Home/tools/DMTDscntMig directory and open the sample.reg file in a text editor.

2. Enter your configuration settings in the sample.reg registry file. Pay particular attention to these registry entries:
   - Use LogFileName to specify the name and location of the log file.
   - Use UserName to specify the user name for the Pipeline database.
   - Use PassWord to specify the password for the Pipeline database.
   - Use DatabaseName to specify the name of the Pipeline database.
   - Use AccessLib to specify the name of the database library files.
   - Use RootNode to specify the root node name to write in the XML output file.
   - Use Name to specify the name of the parent node for storing the SQL query output.
   - Use Query to specify the file name of the SQL Query. Portal provides a rollover.sql file and a discount.sql file. To create custom queries, see “Using Custom Queries”.
   - Use OutputFile to specify the name and location of the XML and DAT output files.

   For more information, see “Registry Entries” in "DMTDscntMig".

3. Save and close the file.

4. Load the registry configuration file by using this command:

   DMTDscntMig -r registry_config_file_name

   where registry_config_file_name is the name and location of the sample.reg file.

   If the utility runs successfully, it creates two output files in the location specified in the OutputFile registry entry:
   - An XML file, which contains your 6.5 discount configuration data. You will load this file into your Portal 7.3 database by using the loadpricelist utility. See "Loading Discount Configuration Data into the Portal 7.3 Database".
   - A DAT file, which contains your 6.5 discount subscription mapping data. You will load this file into your Portal 7.3 database by using the pin_smt utility. See "Loading Subscription Mapping Data into the Portal 7.3 Database".

Using Custom Queries

In rare cases, you might need to enhance performance by creating custom SQL queries in addition to the standard queries provided with Discount Data Migration. A typical scenario is when you must migrate a million records. You can create custom queries to migrate smaller sets of data until the job is complete. For example, the custom queries can migrate records 1 to 20,000 first and the rest later.
In this case, you must also modify the OpenRootNode and CloseRootNode entries in the discount configuration registry file to include more entries for the custom queries. For more information, see "Registry Entries" in "DMTDscntMig".

By default, the registry file includes entries for two queries (rollover.sql and discount.sql).

The first entry uses:

OpenRootNode = True
CloseRootNode = False

The second entry uses:

OpenRootNode = False
CloseRootNode = True

This allows the resulting XML file to have only one root node element because creating multiple root node elements in the same XML file causes an error.

To suit your business requirements, you can also customize the XSL file that Discount Data Migration provides by changing some of the default values for fields such as price list, deals, products, and discounts.

**Loading Discount Configuration Data into the Portal 7.3 Database**

You load the discount configuration data that was extracted by the DMTDsntMig utility into the Portal 7.3 database by using the loadpricelist utility.

To load the discount configuration data, run loadpricelist on your Portal 7.3 system:

```
loadpricelist -cf XML_file_name
```

where XML_file_name is the name of the XML file that contains the discount configuration data. For more information, see “loadpricelist” and “Using the XML pricing interface to create a price list” in BRM Setting Up Pricing and Rating.

You can use Pricing Center to verify that the discounts loaded successfully.

**Retaining Discount Model ERAs from Portal Release 6.5**

By default, Portal deletes any DISCOUNTMODEL ERAs associated with accounts when migrating discount data from Release 6.5 to Portal 7.3. If you want accounts to retain the DISCOUNTMODEL ERAs from Release 6.5, modify the delete_discount_era entry in the pin_sub_mig configuration file (Portal_Home/apps/pin_sub_mig/pin.conf).

---

**Important:** If you migrate shared discounts instead of deleting them, you cannot retain DISCOUNTMODEL ERAs during migration; do not modify the delete_discount_era entry.

---

To retain discount ERAs from Release 6.5:

1. Open the pin.conf file in Portal_Home/apps/pin_sub_mig.
2. Change the value of the delete_discount_era entry to 0:
   ```
   - pin_sub_mig delete_discount_era 0
   ```
3. Save and close the file.
Loading Subscription Mapping Data into the Portal 7.3 Database

You load the subscription mapping data that was extracted by the DMTDsntMig utility into your Portal database by using these scripts:

- **pin_smt_create_obj.pl** - Creates an /smt_acct_mig object for storing the subscription mapping data. It also creates temporary tables for storing the subscription mapping data before it is migrated.

- **pin_smt_create_procs.pl** - Creates the stored procedures, which collect the relevant accounts for subscription migration.

- **pin_smt** - Loads subscription mapping data into the Portal 7.3 database.

You configure these scripts by using the smt.cfg configuration file.

To migrate subscription mapping data, perform these steps on your Portal 7.3 system:

1. Install Patch 4489.
2. Open the Portal_Home/apps/pin_sub_mig/smt.cfg file in a text editor.
3. Edit the entries described in Table 22–2 so that the script can connect to your Portal 7.3 database.

### Table 22–2  Connecting to Portal 7.3

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB_NUMBER</td>
<td>The Portal database number. By default, this is set to 0.0.0.1.</td>
</tr>
<tr>
<td>DB_USER</td>
<td>The database user name. By default, this is set to pin.</td>
</tr>
<tr>
<td>DB_PASSWD</td>
<td>The user password. By default, this is set to pin.</td>
</tr>
<tr>
<td>DB_NAME</td>
<td>The Oracle database name. By default, this is set to pindb.</td>
</tr>
<tr>
<td>DM_HOST</td>
<td>The server or host name where the Data Manager (DM) is running.</td>
</tr>
<tr>
<td>DM_PORT</td>
<td>The DM port number.</td>
</tr>
<tr>
<td>SOURCE_FILE</td>
<td>The name and location of the DD_OBJECTS_SMT source file. By default, this is set to Portal_Home/sys/dd/data/dd_objects_smt.source.</td>
</tr>
<tr>
<td>SQL_FILES</td>
<td>The location of the SQL files. By default, this is set to Portal_Home/apps/pin_sub_mig/sql_files.</td>
</tr>
<tr>
<td>CTL_FILES</td>
<td>The control file location. This file is required by SQL loader for loading the input file, *.dat, into the database. By default, this is set to Portal_Home/apps/pin_sub_mig/ctl_files.</td>
</tr>
<tr>
<td>DATA_FILES</td>
<td>The data file location. This is where the input.dat file is located. By default, this is set to Portal_Home/apps/pin_sub_mig/data_files.</td>
</tr>
<tr>
<td>LOG_FILES</td>
<td>The directory where the log files will be placed. By default, this is set to Portal_Home/apps/pin_sub_mig/log_files.</td>
</tr>
<tr>
<td>LOG_LEVEL</td>
<td>The log level. The values can be:</td>
</tr>
<tr>
<td></td>
<td>1 - Error</td>
</tr>
<tr>
<td></td>
<td>2 - Debug</td>
</tr>
<tr>
<td></td>
<td>By default, this is set to 2.</td>
</tr>
</tbody>
</table>
Migrating Discount Data

4. Save and close the file.

5. Go to the Portal_Home/apps/pin_sub_mig/scripts directory and run the pin_smt_create_obj.pl script:
   
   ```
   cd Portal_Home/apps/pin_sub_mig/scripts
   perl pin_smt_create_obj.pl
   ```

   To verify that the script executed successfully, check the smt.pin log file. This log file is created in the directory specified by the LOG_FILES configuration entry.

6. Go to the Portal_Home/apps/pin_sub_mig/scripts directory and run the pin_smt_create_procs.pl script:
   
   ```
   cd Portal_Home/apps/pin_sub_mig/scripts
   perl pin_smt_create_procs.pl
   ```

   To verify that the script executed successfully, check the smt.pin log file.

7. Go to the Portal_Home/apps/pin_sub_mig directory and run the pin_smt utility:
   
   ```
   cd Portal_Home/apps/pin_sub_mig
   pin_smt -i input_file_name
   ```

   where `input_file_name` is the DAT file generated by the "DMTDscntMig" utility.

   If the utility runs successfully, the subscription mapping data is loaded into the Portal 7.3 database. Results are printed to the log file in the location specified in the smt.cfg file.

8. Check the log file for errors. If there are errors, you must correct them manually and rerun the pin_smt utility. For more information, see "pin_smt".

Loading Discount Balance Data into the Portal 7.3 Database

Your Pipeline Rating Engine 6.5 discount balance data is stored in the discount data work file (DscAccountsWork.acc), which is maintained by the DAT_Discount module. You load this file into your Portal 7.3 database by using the migrate_discountbalances script.

To load discount balance data into your Portal 7.3 database, perform these steps on your Portal system:

1. Open the Portal_Home/upgrade/65_73/upgrade.cfg file in a text editor.

2. Edit the entries described in Table 22–3 so that the script can connect to your Portal 7.3 database.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OWNER</td>
<td>Specifies the Portal database user name. By default, this is set to pin.</td>
</tr>
</tbody>
</table>

Table 22–2 (Cont.) Connecting to Portal 7.3

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIB_FILES</td>
<td>The location of the libraries for the subscription migration utility. By default, this is set to Portal_Home/apps/pin_sub_mig/lib. Note: Verify that the PERL5LIB environment variable is a system variable and contains the path of the LIB_FILES.</td>
</tr>
</tbody>
</table>
3. Save and close the file.

4. Load the discount balance data into the Portal 7.3 database by running the `migrate_discount_balances.pl` script:

   ```
   cd Portal_Home/upgrade/65_73
   perl migrate_discount_balances.pl
   ```

   For more information on this script, see "migrate_discount_balances.pl".

   If the utility runs successfully, the discount balance data is loaded into the Portal 7.3 database. Results are printed to the log file in the SQL log directory.

5. Check the SQL log file for errors:
   - If no errors are listed, the balance data loaded successfully.
   - If errors are listed, the script failed to load the balance data. The entire transaction was rolled back and all changes were undone in the Portal 7.3 database. You must fix the errors and then rerun the `migrate_discount_balances.pl` script.

### Upgrading Your System to Pipeline Manager 7.3

After you migrate your 6.5 discounting data to the Portal 7.3 database and verify that the data loaded successfully, you can safely upgrade your Pipeline database.

**Caution:** You must ensure that your discount data loaded successfully into the Portal 7.3 database before you upgrade the Pipeline Manager database. If migration fails, you can try again to extract the data from the Pipeline Manager database. A second attempt would not be possible if you already upgraded the Pipeline Manager database.

### Performing Post-Migration Updates

After you have successfully migrated your discount data to Portal 7.3 and have upgraded to Pipeline Manager 7.3, you must perform the following tasks:

- **Updating Cross-Product Discounts After Migrating Discount Data**

---

**Table 22–3 (Cont.) Connecting to Portal 7.3 Database**

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASSWD</td>
<td>Specifies the Portal database password. By default, this is set to pin.</td>
</tr>
<tr>
<td>DBNAME</td>
<td>Specifies the name of the Portal database you are upgrading. By default, this is set to pindbdb.</td>
</tr>
<tr>
<td>DISCOUNT_BALANCES_FILE</td>
<td>Specifies the name and location of the discount data work file. By default, this is set to Portal_Home/upgrade/65_73/DscAccountsWork.acc.</td>
</tr>
<tr>
<td>CHARGE_RESOURCE_ID</td>
<td>Specifies the charge resource ID. By default, this is set to 1000997.</td>
</tr>
<tr>
<td>QUANTITY_RESOURCE_ID</td>
<td>Specifies the quantity resource ID. By default, this is set to 1000998.</td>
</tr>
<tr>
<td>EVENTRESOURCE_ID</td>
<td>Specifies the event resource ID. By default, this is set to 1000999.</td>
</tr>
</tbody>
</table>
Creating System Discounts After Migrating Discount Data

Updating Cross-Product Discounts After Migrating Discount Data
When you migrate discount data from a release prior to Portal 7.3, you must modify how discounting updates aggregated usage counters for all cross-product usage discounts.

In releases prior to Portal 7.3, usage accumulated automatically, making it unnecessary to update an aggregation counter in the discount.

In Portal 7.3, you must impact the aggregation counter resource.

Use Pricing Center to update cross-product discounts.

To update cross-product discounts, modify the discount that aggregates service usage by changing the following components in the discount model configuration:

1. In the discount trigger, delete the condition. When there is no condition, the discount is automatically applied.

2. In the discount rule:
   - If the step has a limited threshold, change it to unlimited (0 to \text{infinity}).
   - Modify the balance impact configuration that applies no balance impact.
   - Change it to increment the aggregation counter resource and apply the impact to the current cycle. For example, enter these values:

   \text{Impact/Consume} = \text{Counter\_resource\_ID} \\
   \text{Amount} = 1; \text{Beat} = 1 \\
   \text{Base\ Expression} = \text{TotalC} \text{if the counter tracks charges or TotalQ} \text{if the counter tracks a non-currency quantity such as minutes.} \\
   \text{Impact: Current cycle}

Creating System Discounts After Migrating Discount Data
When you migrate discount data from a release prior to Portal 7.3, you must create system discounts to be applied to all the accounts in the system before discounting can be used.

Use Pricing Center to create system discounts.

To create system discounts:

1. Load the following resource IDs by using the \text{load\_pin\_beid} utility. See \text{load\_pin\_beid} in \text{BRM Setting Up Pricing and Rating}.
   - \$\text{CHARGE\_RESOURCE\_ID} = 1000997. Specifies the charge resource ID. The default is 1000997.
   - \$\text{QUANTITY\_RESOURCE\_ID} = 1000998. Specifies the quantity resource ID. The default is 1000998.
   - \$\text{EVENT\_RESOURCE\_ID} = 1000999. Specifies the event resource ID. The default is 1000999.

2. Create the discount master. See Pricing Center Help.

3. Create the discount rule and three balance impacts, one for each resource ID. See Pricing Center Help.
   - Enter these values:
Drum Expression = 1.0  
Rule Type = Tiered  
Drum Type = Quantity  
Threshold From = 0  
Threshold To = Infinity  
Impact/Consume = 1000997, Aggregation charge counter  
Applied To = Event Owner  
Percentage = 100%  
Base Expression = TotalC  
Impact/Consume = 1000998, Aggregation quantity counter  
Applied To = Event Owner  
Percentage = 100%  
Base Expression = TotalQ  
Impact/Consume = 1000999, Aggregation event counter  
Applied To = Event Owner  
Percentage = 100%  
Base Expression = 1.0

4. Create a discount trigger. See Pricing Center Help.
   Enter these values:
   
   **Condition Expression** = 1.0  
   **Condition Operator** = Greater Than or Equal  
   **Condition Value** = 0

5. Create a discount model. See Pricing Center Help.
   Enter these values:
   
   **Version** = 1  
   **Status** = Active  
   **Discount Trigger** = Select the discount trigger created in step 4.  
   **Discount Rule** = Select the discount rule created in step 3.  
   **Multiple Discount per event** = Parallel

6. Create a discount object. See Pricing Center Help.
   Enter these values:
   
   **Discount Type** = System  
   **Priority** = 100

7. Associate the discount object with the discount model created in step 5.

8. Stop and restart the Portal processes. See “Starting and stopping the BRM system” in *BRM System Administrator’s Guide*. 

---

**Migrating Discount Data**

---

"Understanding and Migrating Discount Data" 22-13
Using Discount Data Migration Utilities

This section provides reference information for BRM Discount Data Migration utilities.
**DMTDscntMig**

**Description**
Extracts discount configuration data and subscription mapping data from your Pipeline database. See "Extracting Discount Data from the Pipeline 6.5 Database".

**Note:** This utility is packaged with Pipeline Manager 7.3.

**Location**

*Pipeline_Home/bin*

**Syntax**

```
DMTDscntMig -r registry_config_file_name
```

**Parameters**

- `registry_config_file_name`
  Specifies the path and filename for the registry file. This file specifies how to connect to the pipeline database and the location of your XML and XSL files.

**Note:** You can use the sample registry file (*Pipeline_Home/tools/DMTDscntMig/sample.reg*) as a starting place.

**Registry Entries**

Table 22–4 describes the DMTDscntMig registry entries

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LogFileName</td>
<td>The application log file name that includes the path where the log file is stored.</td>
</tr>
<tr>
<td>UserName</td>
<td>The login name to use for connecting to Portal™.</td>
</tr>
<tr>
<td>PassWord</td>
<td>The password for the specified user name.</td>
</tr>
<tr>
<td>DatabaseName</td>
<td>The database alias name.</td>
</tr>
<tr>
<td>AccessLib</td>
<td>The database library. Specifies the name of the database access library, without the <code>lib</code> prefix and <code>.so</code> suffix:</td>
</tr>
<tr>
<td>RootNode</td>
<td>The root node that must be written to the output XML file. By default, the sample script is named output. However, you can change the name.</td>
</tr>
<tr>
<td>DataModule</td>
<td>The database module that DBTransformation must connect to.</td>
</tr>
</tbody>
</table>
Table 22–4  (Cont.) Registry Entries

<table>
<thead>
<tr>
<th>Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The name of the parent node in which the output of the SQL query is stored.</td>
</tr>
<tr>
<td>Query</td>
<td>The input query file name. By default, rollover.sql, the sample query file, is displayed as the input query file name. However, if you write a query, make sure it is a single line query that ends with a semicolon. See &quot;Using Custom Queries&quot;.</td>
</tr>
<tr>
<td>OutputFile</td>
<td>The output file name. This should include the path where it will be stored.</td>
</tr>
<tr>
<td>OpenRootNode</td>
<td>Specifies whether to use the &lt;rootnode&gt; start tag. If set to True (default), the start tag of the root node element is defined in the XML file. Note: Every XML file must contain only a single root node element. You can limit the number of root node elements in the XML file by setting the OpenRootNode tag to False. Results from the SQL files (rollover.sql and discount.sql) are contained within the root node element in the XML file.</td>
</tr>
<tr>
<td>CloseRootNode</td>
<td>Determines whether the end-tag of the root node element &lt;/rootnode&gt; must be defined in the XML file. If set to True (default), the end-tag of the root node element is defined in the XML file.</td>
</tr>
<tr>
<td>inputXMLFile</td>
<td>The name of the input XML file.</td>
</tr>
<tr>
<td>inputXSLFile</td>
<td>The name of the XSL file that includes the rules to apply to the input XML file.</td>
</tr>
<tr>
<td>Output XML File</td>
<td>The name of the output XML file in which the results are stored.</td>
</tr>
</tbody>
</table>

Sample Registry File

```xml
XSL
{
  LogFileName = path/logfilename
  DataPool
  {
    Login
    {
      Module
      {
        UserName = DBUSERNAME
        PassWord = Encrypted_DB_password
        DatabaseName = DB_service
        AccessLib = oci61
      }
    }
  }
  RootNode = output
  Transform1
  {
    DataModule = Login1
    Module
    {
      Name = rollover
      Query = rollover.sql
      OutputFile = DBData.xml
    }
  }
}
```
OpenRootNode = True
CloseRootNode = False

Transform2
{
  DataModule = Login2
  Module
  {
    Name = discount
    Query = ./discount.sql
    OutputFile = ./DBData.xml
    OpenRootNode = False
    CloseRootNode = True
  }
}

XSLTTransform
{
  XSLTTransform1
  {
    Module
    {
      inputXmlFile = ./DBData.xml
      inputXSLFile = ./Intermediate1.xsl
      outputFile = ./Intermediate1.xml
    }
  }
  XSLTTransform2
  {
    Module
    {
      inputXmlFile = Intermediate1.xml
      inputXSLFile = Intermediate2.xsl
      outputFile = Intermediate2.xml
    }
  }
  XSLTTransform3
  {
    Module
    {
      inputXmlFile = ./Intermediate2.xml
      inputXSLFile = ./SbscrpMigFile.xsl
      outputFile = ./SbscrpMigFile.dat
    }
  }
}

#End of Registry
migrate_discount_balances.pl

Description

Use the migrate_discount_balances.pl script to load discount balance data into the Portal™ 7.3 database.

To load data, the script requires a discount balance work file in the directory specified in the DISCOUNT_BALANCES_FILE entry of the upgrade.cfg file. See "Loading Discount Balance Data into the Portal 7.3 Database".

Location

Portal_Home/upgrade/65_73

Syntax

perl migrate_discount_balances.pl

Results

If the migrate_discount_balances.pl script does not notify you that it was successful, see the log files in the SQL log directory to find any errors.

This script runs in a single transaction. If migration fails, the script rolls back the entire transaction and undoes all changes in the Portal 7.3 database. You can then fix any problems and rerun the script.
Use the **pin_smt** utility to perform the following:

- Load subscription mapping data into the Portal™ database.
- Purchase required add-on deals for a customer account.

Discount ERAs are bundled with deals. The deal names that contain these extended rating attributes (ERAs) are provided by the discount configuration utility in a DAT file. When the deals are loaded into the Portal database, the ERAs that exist in the Pipeline Manager 6.5 database are loaded into the Portal 7.3 database. This may duplicate the deals that are already loaded; therefore, one of the deals in the database must be deleted to avoid redundancy. The **pin_smt** utility searches for redundant deals and deletes them.

**Important:** To connect to the Portal database, the **pin_smt** utility needs a configuration file in the same directory. See “Creating Configuration Files for BRM Utilities” in *BRM System Administrator’s Guide*.

**Location**

`Portal_Home/apps/pin_sub_mig`

**Syntax**

```
pin_smt [-i input_filename] [-r] [-h]
```

**Parameters**

- **-i input_filename**
  Populates the `/smt_account_mig` object with the account details specified in the `input.dat` file where `input_filename` is the `input.dat` file containing subscription mapping data for the subscription migration utility. If the utility runs successfully, the subscription mapping data is migrated to the Portal database. For all the accounts that are migrated successfully, it updates the status to 0 in the `/smt_account_mig` object. For the accounts that had errors, it updates the status to 1.

- **-r**
  Processes only those accounts that are not migrated or have errors.

- **-h**
  Displays help information for **pin_smt**.

**Results**

If the **pin_smt** utility doesn't notify you that it was successful, look in the utility log file (`default.pinlog`) to find any errors. The log file is in a directory specified in the configuration file. If there are errors, you must correct them manually and rerun the utility using the following option:

```
pin_smt -r
```