

# Oracle® Communications Billing and Revenue Management

## Release Notes



Release 15.1

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# Preface

This guide includes information about the features added to the Oracle Communications Billing and Revenue Management (BRM) 15.1 release.

## Audience

This document is intended for all BRM users.

## Documentation Accessibility

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

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## Diversity and Inclusion

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# 1

## Support and Certification Changes

Learn about the support and certification changes in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [Support and Certification Changes in 15.1](#)
- [Support and Certification Changes in 15.0.1](#)
- [Support and Certification Changes in 15.0.0](#)

### Support and Certification Changes in 15.1

Starting in 15.1, the Billing and Revenue Management Suite now supports the following software:

- Oracle Linux 9.4 (Runtime)
- Oracle Java Platform, Standard Edition (Java SE) 21 version 21.0.4
- Oracle Helidon 4.1.6
- Oracle JavaScript Extension Toolkit (Oracle JET) version 17.1.0
- Oracle Fusion Middleware 14.1.2
- Vertex Sales Tax Q Series 10.1
- Oracle NoSQL Database 24.1
- Oracle Coherence for Java Libraries 14.1.2

See *BRM Compatibility Matrix* for information on other software support.

### Support and Certification Changes in 15.0.1

Starting in 15.0.1, the Billing and Revenue Management Suite now supports the following software:

- Oracle Database Server Enterprise Edition 19c version 19.21.0
- Oracle Database 19c client version 19.21.0
- Oracle Java Platform, Standard Edition (Java SE) 8 version 1.8.0\_401

See *BRM Compatibility Matrix* for information on other software support.

Release 15.0.1 also includes support for TLS 1.3, except for communication with the database.

### Support and Certification Changes in 15.0.0

Starting in 15.0.0, the Billing and Revenue Management Suite now supports the following software:

- Oracle Linux, x86-64 (64-bit) 8.7

- Oracle Database Server Enterprise Edition 19c version 19.20.0
- Oracle Database 19c client version 19.20.0
- gcc Compiler version 12.2.1
- Oracle Java Platform, Standard Edition (Java SE) 8 version 1.8.0\_381
- Vertex Communications Tax Q Series 3.02
- Vertex Sales Tax Q Series 10

See *BRM Compatibility Matrix* for information on other software support.

# 2

## Documentation Set Updates

Learn about the changes to the Oracle Communications Billing and Revenue Management (BRM) Suite documentation set.

See the following for a list of changes were made to the documentation set for each release of the BRM Suite:

- [Documentation Set Updates for 15.1](#)
- [Documentation Set Updates for 15.0](#)

### Documentation Set Updates for 15.1

The following changes were made to the documentation set in the 15.1 release:

- The contents of the *BRM Configuring Pipeline Rating and Discounting* book have been split into multiple different books. Some of the material was moved into new books, and some of it was merged with content in existing books. [Table 2-1](#) displays the mapping between the parts of *BRM Configuring Pipeline Rating and Discounting* and their new locations.

**Table 2-1 Pipeline Documentation Mapping**

Previous Location	New Location
Part I Configuring Pipeline Rating	This information is now located in "Configuring Pipeline Rating" in the new <i>BRM Setting Up Pipeline Rating and Discounting</i> book.
Part II Setting Up Pricing for Real-Time Rating and Pipeline Manager	This information is now located in the new <i>BRM Setting Up Pipeline Pricing</i> book.
Part III Configuring Pipeline Discounting	This information is now located in "Configuring Pipeline Discounting" in the new <i>BRM Setting Up Pipeline Rating and Discounting</i> book.
Part IV Customer and Financial Management	This information is now located in "Customer and Financial Management" in the new <i>BRM Setting Up Pipeline Rating and Discounting</i> book.
Part V Suspending and Recycling EDRs	This information is now located in the new <i>BRM Suspending and Recycling Pipeline EDRs</i> book.
Part VI Loading Rated Events	This information has been merged into the <i>BRM Loading Rated Events</i> book.
Part VII Setting Up Rerating	This information is now located in the new <i>BRM Rerating Pipeline Events</i> book.
Part VIII Pipeline Manager System Administration	This information is now located in the first seven chapters of the new <i>BRM Pipeline Manager Administration Guide</i> book.
Part IX Installing Pipeline Manager, Chapter 75 Installing Pipeline Manager	This information is now located in "Installing Pipeline Manager" in <i>BRM Installation Guide</i> .
Part IX Installing Pipeline Manager, Chapter 76 Testing Pipeline Manager	This information is now located in "Testing Pipeline Manager" in the new <i>BRM Pipeline Manager Administration Guide</i> book.
Part X Pipeline Manager Reference	This information is now located in the new <i>BRM Pipeline Manager Reference</i> book.

- The documentation concerning business parameters has been enhanced and updated. See "Business Parameter Reference" in *BRM System Administrator's Guide* and the sections linked from that page.

## Documentation Set Updates for 15.0

The following changes were made to the documentation set in the 15.0 release:

- The contents of the *Upgrade Guide* were moved into the *Installation Guide*. See "About Upgrading from BRM 12.0 to BRM 15.0" and "Upgrading BRM and Pipeline Manager from BRM 12.0 to BRM 15.0" in *BRM Installation Guide* for this information.
- The contents of the *Patch Set Installation Guide* were moved into the *Installation Guide*. See "Upgrading BRM 15.0 to a Later Release of BRM 15.0" in *BRM Installation Guide* for this information.
- There will not be a *Patch Set Release Notes* document for 15.0. That information is included in this document.
- There will not be an *ECE Release Notes* document for 15.0. That information is included in this document.

# 3

## Summary of Customer-Reported Fixes

Learn about the customer-reported bug fixes included in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [Customer-Reported Fixes in BRM](#)
- [Customer-Reported Fixes in ECE](#)
- [Customer-Reported Fixes in PDC](#)
- [Customer-Reported Fixes in Billing Care](#)
- [Customer-Reported Fixes in Business Operations Center](#)
- [Customer-Reported Fixes in BRM Thick Clients](#)

### Customer-Reported Fixes in BRM

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications Billing and Revenue Management (BRM):

- [Customer-Reported Fixes in BRM 15.1](#)
- [Customer-Reported Fixes in BRM 15.0.1](#)

### Customer-Reported Fixes in BRM 15.1

[Table 3-1](#) lists the customer-reported issues that were resolved in BRM 15.1.

**Table 3-1 Customer-Reported Fixes for BRM 15.1**

Bug Number	Description
36616116	A discrepancy existed between the 'item_total' value in the 'item_t' table and the 'amount' value in the 'event_bal_impacts_t' table for certain events. This has been fixed. The REFPlugin now updates the 'rel_sub_process_t' status to UPDATE_ERROR for the session where the update error occurred.
36907043	When load cleanup failed in REM, but session deletion succeeded, partially loaded data could not be cleaned up. This has been fixed. Now, session data is deleted only after load cleanup completes successfully.
37315280	In the default implementation, Rated Event Formatter (REF) is configured with the same value for <b>data</b> and <b>done</b> directories, so an error is seen when the control file directory is not the same as the data file directory in ECE's REF configuration. The has been fixed. REF plugin has now been modified to use different <b>data</b> , <b>done</b> and <b>header</b> directories.

**Table 3-1 (Cont.) Customer-Reported Fixes for BRM 15.1**

Bug Number	Description
36606358	Row lock contention on the 'event_bal_impacts_t' table occurred when processing a large number of events for a small number of accounts. To resolve this, a new parameter, <b>update_by_balgrp</b> , was added to the REL <b>Infranet.properties</b> and REM <b>Infranet.properties</b> files. This parameter enables each updater thread to process data for a set of balance groups (nearly mutually exclusive, depending on the number of threads), thereby reducing contention.
36801678	The PIN_FLD_OFFERING_OBJ field was missing from the purchase discount and purchase product arrays in the response to a WebService request for pcmOpSubscriptionGetPurchasedOfferings. This has been fixed.
37106470	Wrong comment is found in the <b>cm_cache.h</b> file. This has been fixed.
36982701	update_data_sequence was returning the same sequence twice. This has been fixed. The stored procedure is updated to retrieve unique header numbers using appropriate transaction control.
37129887	The PIN_SEQUENCE package was enhanced to support encoding of POIDs based on local timezones and DST calculations via geographical timezones.
37023412	There was an issue about discount cycle validity flags information in docs. The docs are now updated with the correct information.
36694622	In previous releases, discount was not getting overridden with price_tags for billing time discount event. This has been fixed.
36668921	Discounts were not being overridden with price_tags for purchase fee events due to incorrect start/end dates used for filtering tags. This has been fixed. Correct START/END dates are now used for purchase events.
36846461	Few of the opcodes were missing in the WebServicesManager config role. This has been fixed.
36830570	When an offer is configured as enforceCreditLimit set to OUTSTANDING_AMOUNT is purchased, it is failing. This has been fixed.
36825390	MTA framework is enhanced to incorporate use of complex search queries involving EXTRA_RESULTS and LINKED_OBJ fields.
37058432	The <b>/offering_override_values</b> buffer contained invalid values for migrated accounts. This issue has been fixed. A NULL character is now added to the end of the buffer to align the results.
36496077	When an offer with a future-dated cancellation was processed using <b>pin_cycle_fee - defer_cancel</b> , the overridden offer was incorrectly selected for cancellation, resulting in charges not being generated. This has been fixed.
36524503	<b>pin_cycle_fees</b> utility was not splitting events for multi-month previous cycle charges, instead it created a long cycle event for multiple previous months. The utility is fixed to split the events for each month and assign these events to appropriate bills.
36601478	Previously, in skip billing scenarios, <b>config_billing_delay</b> was set without errors when billing was first run for the parent account. This has been fixed. The utility now throws an error when parent billing is run first.
36916957	In wholesale billing scenarios in certain cases balances are not rolled up to the parent. This has been fixed.

**Table 3-1 (Cont.) Customer-Reported Fixes for BRM 15.1**

Bug Number	Description
36963929	The item's MOD_T is not getting updated in case of undefined payment types billing. The issue is fixed to correctly modify MOD_T value with updates in items values.
36568144	The <b>/offering_override_value</b> storable class was not getting populated post migration due to PERCENT getting appended in the dat file. Fix was provided to not append PERCENT if not passed in the input XML.
37168980	Previously, <b>/offering_override_value</b> was not getting created when a service was being transferred across accounts. This has been fixed.
36658766	In previous releases, when <b>pin_update_balances</b> utility was run from the pje pod, it was throwing an error. This has been fixed.
37117470	PCM_OP_SUBSCRIPTION_POL_CRUD_OFFER_OVERRIDE flag could not be overridden because of the missing override flag entry. This has been fixed.
37084589	The RATE_ECE_EVENT was sending granted sub-balances for the same resource with identical data in a single event. BRM merges these sub-balances when the data matches. However, the granted_bal was not aggregated during the merge. This has been fixed.
37018577	The PIN_FLD_COUNT field was missing in the output flist of the PCM_OP_COLLECTIONS_GET_AGENT_ACTIONS opcode. This has been fixed.
36868376	A new policy opcode is added to modify the response of the PCM_OP_AR_GET_ACCT_ACTION_ITEMS opcode.
36633403	Incorrect tax was calculated for event adjustment. This has been fixed.
37158826	CMT was sometimes not able to convert timestamp into UNIX epoch format due to which loading was failing. This has been fixed.
36514273	Granted and current balance mismatch during balance transfer from user balance to sharer balance. This has been fixed.
36608425	After rerating on cancelled product, granted_bal was not having correct value. This has been fixed.
36648809	Memory corruption during cache creation was detected. This has been fixed.
36664759	There was an issue detected while loading tax codes. This has been fixed.
37079678	Invalid FLIST pointer encountered as Bad flist ptr in event-level adjustment . The "Bad flist ptr" error in event-level adjustment has been fixed by implementing pointer validation and improving error handling.
36999465	The PCM_OP_AR_GET_BILL_ITEMS opcode failed when the Service ID was included in the input. This has been fixed. The search functionality has been optimized to handle cases with more than 32 service objects, now correctly returning all items that match the specified Service ID.



Table 3-1 (Cont.) Customer-Reported Fixes for BRM 15.1

Bug Number	Description
37273396	When the Bill Now operation was executed, tax calculation occurred at the parent account level, and the cycle_tax interval was ignored. To resolve this issue, changes were implemented to calculate tax at the subordinate account level.
37196387	Pending Recv was turning negative when charge was given back to an account. This has been fixed.
36535839	Payment was getting reversed when effective date was before the account creation date. Payment reversal is fixed to throw an appropriate error.
36548780	Tax calculation was wrong when wholesale billing was enabled. This has been fixed. Tax calculation is corrected during prebill dispute and settled post billing for a subordinate account at event level.
36573111	<b>pin_cycle_fees</b> was throwing on ORA-0100 error. This has been fixed.
36684361	CMT sometimes was not able to convert Extension Date Field to Unix Timest. This has been fixed.
36553365	Multiple ordered balance group were not getting created in case of account-level group sharing discount during migration. This has been fixed.
37417558	dm_oracle was not able to enqueue messages greater than 4000 bytes as read-only transaction was opened from the publish FM. Publish FM has been fixed to send read write transaction to dm_oracle if no external transaction is present.
36815638	Failure in suspense preprocessing. To fix the issue, supported special character parsing as part of suspense preprocess script.
37344933	Long running sessions on rel_event_extract_sync while REL loading because the process was holding lock for longer time doing backup of interim files (due to NFS mount point having huge number of files). To fix the issue, changes were done in <b>pin_rel_handle_interim_files.pl</b> (which does backup of interim files) to fetch the file from header file for ECE rated CDR.
36916956	While publishing an offer, all the rate plans in the product are added for each event, which results in unrelated rate plans are being included under usage maps. This has been fixed.
37014868	BDTs valid for mid-cycle were not being applied for discounting due to validity checks on the secondary billinfo. The fix now ensures these BDTs are correctly applied, even for secondary billinfo.
37355584	The <b>pin_state_change</b> utility was processing services with lifecycle states lacking transitions, resulting in longer completion times. The code has been modified to set the expiration_t of these services to 0 and adjust the MTA search criteria to exclude services with expiration_t set to 0.
36543957	The EFFECTIVE_T and INSTANTIATED_T fields were not being published under ProductPurchaseEvent, causing product rating validation failures in ECE during bundle changes. The fix now publishes these fields.
36524496	Balance synchronization during in-advance cycle events led to incorrect balances. To resolve this, balance synchronization between BRM and ECE was skipped during these events.

## Customer-Reported Fixes in BRM 15.0.1

Table 3-2 lists the customer-reported issues that were resolved in BRM 15.0.1.

**Table 3-2 Customer-Reported Fixes for BRM 15.0.1**

Bug Number	Description
35377607	When values in the <b>pin.conf</b> configuration file were set as environment variables, the BRM <b>pin.conf</b> reader would remove the last character from the variable value if the length of the environment variable key and value were equal. This has been fixed.
35904016	In the set of files provided to Rated Event Manager (REM) by ECE, ECE was returning the files in a different order, causing a NULL pointer exception. This has been fixed by sorting the temporary files in natural order and the done files in reverse order, to ensure that the header file is always processed last.
35937539	Memory leaks were detected when <b>pin_deploy</b> was run for very large batches. This has been fixed.
35949445	When the PCM_OP_BILL_ITEM_TRANSFER opcode was called, the transfer of the credit amount to a new bill was failing. This has been fixed. The PCM_OP_BILL_ITEM_TRANSFER opcode has been modified to make the credit transfer possible.
36008442	Rated Event Manager (REM) was unable to deserialize events due to the addition of the field PIN_FLD_GRANTED_BAL in the EVENT_ESSENTIALS_T table. This has been fixed.
36048820	There was no policy hook available for modifying the input flist of PCM_OP_SUBSCRIPTION_PURCHASE_DEAL. This has been fixed. A new policy hook has been added to the PCM_OP_SUBSCRIPTION_POL_PREP_OFFERRING policy opcode to customize the input flist being sent to the PCM_OP_SUBSCRIPTION_PURCHASE_DEAL, PCM_OP_SUBSCRIPTION_PURCHASE_PRODUCT, and PCM_OP_SUBSCRIPTION_PURCHASE_DISCOUNT opcodes. Through this policy hook, the user can modify the flist and add custom logic to override default pricing amounts for both <b>/purchased_product</b> and <b>/purchased_discount</b> .
35863453	While invoking the cancel discount opcode, if the PIN_FLD_END_T field was passed, it was not being set to the PIN_FLD_EFFECTIVE_T field, due to which wrong charges were applied. This has been fixed by setting the PIN_FLD_END_T field to PIN_FLD_EFFECTIVE_T.
35884131	When a product was configured with multiple events, one of the events failed due to a credit limit exceeded error with rating status 29 but the other events were successful. Additionally, cycle fee dates were not getting updated for successful events. This has been fixed.
36032625	When a charge offer with an annual subscription event was purchased, during the PCM_OP_BILL_MAKE_BILL opcode execution, unnecessary updates were made to the BILL_INFO_T and PURCHASED_PRODUCTS_T table, which was causing a billing performance issue. This has been fixed.

**Table 3-2 (Cont.) Customer-Reported Fixes for BRM 15.0.1**

Bug Number	Description
36032623	When a non-currency resource containing a <b>grantor_obj</b> as NULL was being canceled, the validity of the sub-balance of the non-currency resource was being updated to the current time. This has been fixed.
36076651	After upgrading from BRM 12.0 Patch Set 3 to Patch Set 7, charging dates were rounded to midnight. Due to this, any customization in FM_SUBSCRIPTION_POL_SPEC_CYCLE_FREE_INTERVAL.C updated the PIN_FLD_CHARGED_TO_T based on customer-specific time zones. Due to the rounding issue, customization to PIN_FLD_CHARGED_TO_T was being overridden in FM_SUBSCRIPTION_CYCLE_UTILS.C and rounded off to midnight. This has been fixed.
36041326	Memory leaks were detected when the PCM_OP_SUBSCRIPTION_CRUD_OFFER_OVERRIDE opcode was invoked with the offering_override_values POID. This has been fixed.
36047468	The <b>partition_utils</b> utility was not logging the SQL statements to the <b>partition_utils.log</b> file when invoked with the purge option. This has been fixed.
35937536	When the PCM_OP_BILL_ITEM_TRANSFER opcode was invoked from a batch payment, the session object was missing for <b>credit_items</b> . This issue has been fixed by setting the PIN_FLD_SESSION_OBJ field, which is now sent as part of the input flist.
35937542	After upgrading from BRM 12.0 Patch Set 3 to 12.0 Patch Set 7, when the PCM_OP_PYMT_TOPUP opcode was invoked after a checkpoint, an incorrect error was getting logged. This has been fixed.
36066780	There was an issue with setting the font size of text in Customer Center. This issue is fixed by giving the Java option <b>-Dfontsize</b> .
35863980	When PCM_OP_SUBSCRIPTION_CANCEL_PRODUCT was called from <b>pin_cycle_fees -defer_cancel</b> , there was no option to pass the flag to retain the rollover bucket. Due to this, the rollover bucket from the previous month was ending. This issue has been fixed by changing the PCM_OP_SUBSCRIPTION_POL_SPEC_CANCEL policy opcode to accommodate the action flags used to retain the rollover bucket.
35979292	When billing was run, <b>cycle_forward</b> was called first with defer mode, then with normal mode. During defer mode, the product was being rated in <b>calc_mode</b> even though the product was not eligible to be rated. This issue has been fixed by making changes to avoid <b>calc_only</b> rating if the product is not eligible to be rated. The <b>get_purchased_offerrings()</b> call has been optimized to return the results quickly.
35892698	When a product was purchased with multiple quantities and then canceled with partial quantity, the product status was shown as canceled. This caused a synchronization issue with ECE. This has been fixed.

**Table 3-2 (Cont.) Customer-Reported Fixes for BRM 15.0.1**

Bug Number	Description
35856189	When the 31-day billing feature was disabled, if a non-aligned monthly cycle-forward product was purchased on a date after the 28th, cycle alignment dates were incorrect. This has been fixed.
35863982	When an account-level product was canceled, a lock at the account level locked all balance groups in that account, causing issues with concurrent transactions. This is fixed now by passing LOCK_DEFAULT flags, which locks only account-level balance groups.
36450389	A CDR was getting suspended in a delayed billing period where the <b>current_bal</b> was 0 and the <b>next_bal</b> was negative. This has been fixed.
36215710	The PCM_OP_LOAN_GET_LOAN opcode has been enhanced to display profile details when a flag is passed. When this flag is passed, the <b>credit_limit</b> and <b>available_loan_limit</b> are retrieved from the profile.
35937533	Issues were reported with SEL while loading the suspended events. This has been fixed. Unique custom control files are dynamically generated for each suspense file during the pre-processing stage of Suspense Manager.
36272404	The PCM_OP_AR_GET_ACCT_BILLS opcode is enhanced to return PIN_FLD_TOTAL_DUE of the bill.
36272406	When PCM_OP_RATE_GET_PRODUCT was invoked, it was not reading from the CM cache during execution, even though the <b>rate_pre_cache_product_and_disc</b> business parameter was set to 10. This has been fixed.
36277112	Timeout errors on the CMT loader were resulting in errors. This has been fixed. The generation of POID logic was changed for multi-schema scenarios.
36314282	When Bill Now was run for two bill units having the same account at the same time, a deadlock would occur due to which Bill Now would fail. This has been fixed.
36317969	When the PCM_OP_BAL_TRANSFER_BALANCE opcode was invoked with FEE_FLAG set to 3, it returned multiple zeros for the PIN_FLD_TRANSFER_FEE field in the return flist. This has been fixed. The PCM_OP_BAL_TRANSFER_BALANCE opcode has been changed to honor the <b>rating_max_scale pin.conf</b> entry instead of using the maximum scale for precision.
36357638	Compilation of FM_SUBSCRIPTION_POL was failing after upgrading to BRM 12.0 Patch Set 8. This has been fixed.
36359985	When the PCM_OP_AR_EVENT_ADJUSTMENT opcode was invoked, it returned a generic error description for all errors. This has been fixed. The PCM_OP_AR_EVENT_ADJUSTMENT opcode returns the error message from the error buffer.
36378649	For an add-on purchase, the original balance got accumulated instead of being synchronized in the ECE cache. This has been fixed.

**Table 3-2 (Cont.) Customer-Reported Fixes for BRM 15.0.1**

Bug Number	Description
36430111	In a hierarchical setup, the child's due amount was getting added in an intermediate non-paying parent's due amount, because of which the exact amount of child's due was not calculated. This issue has been fixed by adding a new business parameter <b>add_child_due_in_intermediate_parent_bill</b> to add only the child's due value when the parameter is set.
36434781	THRESHOLD_FROM and THRESHOLD_TO of the pipeline IFW_PRICEMDL_STEP table supported up to 15-digit decimals only. This has been fixed. The fields are modified to support up to 28 digits when MAX28DIGIT_DECIMAL_SUPPORT=Y is enabled.
36196199	An enhancement is made to generate PRE_EXPIRY and POST_EXPIRY notifications at the granular level to enable or disable in-advance and post-expiry notifications.
36076657	Memory leaks were detected when invoking the PCM_OP_CREATE_OBJ opcode. This has been fixed.
36130454	The PCM_OP_PYMT_VALIDATE opcode has been modified to store tokens in case of an error from Paymentech.
36041556	The PCM_OP_ZONEMAP_POL_GET_LINEAGE opcode was taking a prolonged time to return results. This has been fixed.
36475412	Proration of a fixed discount was not correctly calculated, due to which an incorrect discount was calculated. This has been fixed.
36477707	Memory leaks were detected in <b>dm_oracle</b> . This has been fixed.

## Customer-Reported Fixes in ECE

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications Elastic Charging Engine (ECE):

- [Customer-Reported Fixes in ECE 15.1](#)
- [Customer-Reported Fixes in ECE 15.0.1](#)

## Customer-Reported Fixes in ECE 15.1

[Table 3-3](#) lists the customer-reported issues that were resolved in ECE 15.1.

**Table 3-3 Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
37458266	In previous releases, tax calculation was found to be incorrect in some cases. This has been fixed.

**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
36902533	In previous releases, with non-linear rating disabled the overages were incorrectly calculated. This has been fixed.
37592478	In previous releases, subscriber login information was missing for some users in the Public User identity (PUI) cache. Due to this, the accounts were not properly synchronized between BRM and ECE. This has been fixed.
37222930	In previous releases, subscriber preferences information was not exposed in HTTP Gateway PreOCS extension. With this release, to enable customization requiring this information, a new method <code>getSubscriberPreferences()</code> , is exposed under interface <code>HTTPPreOCSExtensionContext</code> .
37377275	In previous releases, the item type was incorrectly evaluated for some tax events. This has been fixed.
37422815	In previous releases, ECE was not processing <code>CancelFeeEvent</code> received from BRM, causing a mismatch. This has been fixed. A new configuration for <code>CancelFeeEvent</code> is added in the <b>payloadconfig_ece_sync.xml</b> and <b>pin_notify</b> files.
36797014	In previous releases, with prepaid life cycle management configured, it was observed that even after depleting prepaid balances the account life cycle was remaining as "Active". This has been fixed.
36887034	In previous releases, there was an issue inserting rated events into the cache due to the size considerations. This has been fixed.
36982850	In previous releases, for midsession CDR flow and also initiate CCR flow, during the consumed units rating SNR was not generated even if there was a balance impact or breach. This has been fixed.
37009196	In previous releases, it was not possible to disable Diameter Gateway log messages even after setting appropriate log levels. This has been fixed.
37201299	In previous releases, there was an issue for a Diameter Gateway to connect with an alternative peer. This has been fixed.
37196553	In previous releases, in some cases Diameter Gateway Sy timeout errors were observed. This has been fixed.
37453520	In previous releases, for a cloud native deployment of ECE, if Diameter mediation specification was updated, a restart of Diameter Gateway was needed. This has been fixed.
37486214	In previous releases, while passing unsupported <code>auth-application-Id</code> (4321) in CER, the request was getting timeout at Network as Diameter Gateway was neither logging nor sending a 5010 error. This has been fixed. Also a new return code of <code>PROTOCOL_FAILURE</code> has been added if an unsupported <code>auth-application-Id</code> is passed.
37531168	In previous releases, for period-based rating, the session end time was considered as event time and this was resulting in incorrect balance impacts. This has been fixed. For non linear rating, event time has been updated to be the session start time, so that the product and balance available at the session start will be considered for rating.

**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
37486215	In previous releases, QoS information AVP was included in CCA response which is incorrect as per 3GPP standard. This has been fixed. QoS Information AVP is dropped from the CCA response, but it is made available in the extension hooks for any customizations.
37486217	In previous releases, Diameter Gateway was incorrectly converting IMEISV information into ASCII text format during usage processing. This has been fixed.
37196552	In previous releases, BRM Gateway was doing a retry for an unqualified error code from BRM. This has been fixed. Now BRM Gateway will not retry or send the event to suspense if BRM returns an error code that is not qualified for further processing.
37506173	In previous releases, EM Gateway was observed to have transaction lock issues contributing to higher latencies. This has been fixed.
37569779	In previous releases, BRM Gateway was not using the correct connection pool values, resulting in degraded performance. This has been fixed.
36674050	In previous releases, EM Gateway was observed to have transaction lock issues contributing to higher latencies. This has been fixed.
37491496	In previous releases, the TMP files were not removed after the formatting was completed by Rated Event Formatter. This has been fixed.
37443639	In previous releases, if an account was closed, then any late CDR for that account was not successfully rated, after ECE restart. This has been fixed.
37486218	The customer data loading from BRM into ECE was taking more time than the previous releases. This has been fixed.
37248470	In previous releases, it was observed that the SUBSCRIPTION_CYCLE_FORWARD notification event was getting generated even if subscriptionCycleForwardMode was set to NONE in the ECE application configuration. This has been fixed.
37016384	In previous releases, during customer account provisioning flow if the cache persistence database connectivity was down, ECE was returning an error. Fetching the recurring bundle information when the database was not accessible was also causing an error. This has been fixed. Now, even when the database is down, ECE will not try to write or fetch any information from the database, and hence will not return an error. These operations will wait until the database is back up and running.
37583719	In previous releases, there was an issue when inserting objects into Aggregate Object Usage cache, causing an exception. This has been fixed.
36648960	In previous releases, with some charge offer configurations with multiple tiers, ECE was not moving to the next available tier when the previous tier resource was completely consumed, incorrectly generating an FUI. This has been fixed.
37212324	In previous releases, rounding inconsistencies were observed when you charge and discount the same amount, resulting in an impact which was not expected. This has been fixed.



Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1

Bug Number	Description
37201735	In previous releases, while rating with a charge offer that includes multiple tiers, even though a valid offer with resource (like PAYGO) was available, incorrectly FUI was being triggered. This has been fixed.
37377276	In previous releases, ECE was incorrectly evaluating value maps in a charge selector. This has been fixed.
37543960	In previous releases, SYSTEM_ERROR was being thrown by Diameter Gateway while processing usage requests. This has been fixed.
37519961	In previous releases, during rating flow for a session that includes an MSCC with multiple rating groups, if there was a CREDIT_CEILING_BREACH/NO_RATED_QUANTITY for one rating group the failure response was terminating the complete session. This has been fixed.
37502574	In previous releases, when processing a mid-session CDR trigger during billing activities, Diameter Gateway was responding with the error DIAMETER_UNABLE_TO_COMPLY (5012). This has been fixed.
37496441	In previous releases, when rateZeroQuantity was enabled, the rating for requested service units (RSU) was incorrect. This has been fixed.
36825557	In previous releases, when doing a rolling upgrade of ECE with the continued processing of usage requests, ECE was throwing some exceptions. This has been fixed.
37033252	In previous releases, while creating and dropping of rated event partitions in the ECE database, it was impacting the system performance. This has been fixed.
37079871	In previous releases, SYSTEM_ERROR was being thrown by Diameter Gateway while processing usage requests. This has been fixed.
37374826	In previous releases, for some rated events, the impact category was missing during the rerating process. This has been fixed.
36648958	In previous releases, the ECE persistence job was failing whenever there existed an uncommitted transaction in the CDR Store table. This has been fixed.
36528779	In previous releases, with duplicate detection enabled through <b>terminatedSessionHistoryCacheEnabled</b> , ECE was rejecting unique session id requests that were not actually duplicate. This has been fixed.
36839216	In previous releases, Sy STR on old session was getting success response after overridden with new SLR request. This has been fixed.
37232222	In previous releases, SNRs were only logged but were not published to JMS. There was no issue publishing to Kafka. This has been fixed.



**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
37443638	In previous releases, Diameter Gateway timeout for SNR/SNA was hardcoded to 10 seconds. This has been fixed. Now, it is a configurable option and can be set to milliseconds. This is to avoid long wait time for SNA for each thread and disconnection of diameter peer.
36700237	In previous releases, the failureHandling was not returned in 5G chargingDataResponse. This has been fixed. Now it is returned as per specifications with a default value RETRY_AND_TERMINATE in case of a failure.
37201732	In previous releases, chargingDataResponse was not customizable when byPassOcs had been enabled. This has been fixed.
37018779	In previous releases, rolling upgrade was failing. This has been fixed.
36710009	In previous releases, failure occurred when NRF nfProfileJsonRequestPayload was used in the ECE cloud native setup. This has been fixed. Now you can now define the complete NRF JSON payload in <b>charging-settings.yaml</b> or in any mounted directory accessible from the pod, and provide the path accordingly.
36784694 36897225	In previous releases, traffic was rejected after double transitions between prepaid and postpaid types for the same MSISDN. This has been fixed. Now the MSISDN is reusable after type and state transitions.
36951437	In previous releases, there was an error in EM gateway logs during ECE_POST_COMMIT operation after a customer was deleted in BRM. This has been fixed.
37315428	In previous releases, there was no option to suppress generation of threshold breach notifications for update operation types. This has been fixed.
37212326	In previous releases, billing was failing with credit limit exceeded error in ECE during the update flow. This has been fixed.
37407715	In previous releases, CHF charging response took the workernode IP. This has been fixed. Now it will configure according to the presence or absence of cluster specific configuration.
37349372	In previous releases, the content type of the header was incorrect. This has been fixed. Now the right content type will be added in the request.
37467607	In previous releases, there was service barring value mismatch between the BRM database and ECE cache. This has been fixed. Now warning message has been added to identify such issues.
37507908	In previous releases, for an active-active deployment with federation across the sites enabled, incorrect sequencing of updates was causing overwriting of balance information. This has been fixed by checking the version of the cached object and the federated object for a decision to update.
36596518	In previous releases, account and service termination had been failing while publishing to ECE when terminated first time and was successful on second attempt. This has been fixed.
36825556	In previous releases, Sy AVP 278 Origin-State-ID was missing. This has been added.

**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
36887032	In previous releases, after restarting of ECE, expiration time details were incorrect in audit product. This has been fixed.
37491494	In previous releases, junk characters were loaded in ECE for special characters from the pricing XML. This has been fixed. Now support for special characters is enabled.
36905213	In previous releases, the CreateJmsNotificationQueue script failed during target server validation. This has been fixed.
37212322	In previous releases, both THRESHOLD_BREACH_EVENT and AGGREGATED_THRESHOLD_BREACH_EVENT notifications were getting generated, which was unnecessary. This has been fixed. Now, ECE have flexibility to chooses only either of the one.
37484058	In previous releases, service context cache was growing too much and also notifications were not evenly distributed in Apache Kafka. This has been fixed. Now, Coherence getALL call has been enhanced to keep service contact cache optimized.
37196093	In previous releases, NoSQL support was not there for cleanup of orphan CDRs. This has been added. Now NoSQL support is enabled for orphan CDR cleanup.
36608442	In previous releases, when you configured a price plan with beats and quantity ranges, during usage processing there was an issue with beat creation resulting in incorrect ranges. This has been fixed.
36882605	In previous releases, when processing usage, a new item was getting created at the service level instead of using the existing item at the account level. This has been fixed. Now, if the item already exists at the account level, it is used for processing the usage.
37523393	In previous release, ECE was throwing an exception in TTC worst cost rating flow. This has been fixed.
37519453	In previous releases, in some cases rated events were not loaded into the BRM database. This has been fixed. Additional logging has been added to capture the cases when the payload lacks details leading to loading failures.
36535856	In previous releases, threshold breach was not being generated in the consumed rating for time-based resources. This has been fixed.
37278722	In previous releases, it was observed that the prepaid subscriber status was changing to RECHARGE_ONLY even when balance was available. This has been fixed.
37217081	In previous releases, cycle forward notification was not triggered during certain scenarios. This has been fixed.
35959781	In previous releases, 5G usage was failing due to missing fields in the <b>ece-persistence.yaml</b> file. This has been fixed. Now ECE Persistence playlist has been updated to add all required fields after an upgrade.
36535857	In previous release, custom selectors were not getting initialized in ECE, causing exceptions during the process. This has been fixed.

**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
37185151	In previous releases, actual quantity in newly created tax_on_charge rating was null by default. This has been fixed. Now actual quantity has no default static null value.
36954343	In previous releases, subscription ID was not present in Diameter Gateway logs for 5030 errors. This has been fixed.
37458264	In previous releases, for an active-active deployment, it was observed that federation of data across sites was not working correctly. Now measures have been taken to improve the federation with additional checks of the objects being federated. You can now have an option to disable federation through application configuration prior to the replicateAll command.
36002219	In previous releases, PDP-Address AVP was added as part of the PS_Information AVP for the CCA responses, which is not required as per 3GPP standards. This has been fixed. Now this AVP has been removed from CCA as per 3GPP specs.
37594714	In previous releases, ECE was throwing an error when loading Kafka SSL configurations from the Helm chart. This has been fixed.
37489273	In previous releases, when ECE was deployed in a cloud native environment in Active-Active mode, cache imbalance error was observed when one of the worker nodes in one of the sites was taken down for upgrade activity. This has been fixed.
36648957	In previous releases, it was observed that incorrect logs were overloading production deployments. This has been fixed. Now ERROR/WARN log messages are moved to INFO log level, so as not to overload the log files.
37490875	In previous releases, the <b>.query.sh -P</b> option was not working properly. This has been fixed.
36716164	In previous releases, rating logic considered the end time of CDR instead of start time. This has been fixed. Now you can select start or end time for balance impact based on offer eligibility selection mode.
36902532	In previous releases, non currency and currency impacts were not committed to the BRM database during certain scenarios. This has been fixed.
37028366	In previous releases, when <b>saveNonCounterGrantDuringOngoingSession</b> was enabled, the balances were not updated properly during certain charging scenarios. This has been fixed. Now accumulator flag has been included which commits the balance only after terminate requests.
37443151	In previous releases, even if there existed a renewable balance from which you could consume from, FUI was triggered after base free units were consumed. This has been fixed.
36611222	In previous releases, during a session the consumed reservation information in the active session object was not updated correctly in some scenarios. This has been fixed.
36486976	In previous releases, when a change bundle event was sent from BRM to ECE during an ongoing session, the balance consumption recorded was incorrect. This has been fixed.
36610823	In previous releases, during an ongoing session, even after all available allowances were exhausted, an FUI was not sent to the network. This has been fixed.

Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1

Bug Number	Description
36611240	In previous releases, there was an issue during the cache object serialization causing an exception. This has been fixed.
36745230	In previous releases, there were logs generated for Warning messages for missing optional attributes at product and account level. This has been fixed. Now these messages are moved to INFO level.
36682958	In previous releases, it was observed that duplicate CDRs were being loaded into BRM from ECE. This has been fixed. Now Rated Event Formatter has been enhanced to resolve this issue.
37142914	In previous releases, GSU was not granted correctly for certain scenarios. This has been fixed.
37174434	In previous releases, threshold breach notifications were being triggered when update was received just before the end of balance expiry. This has been fixed.
37490545	In previous releases, there was issue in Kafka event publishing due to some null values in the <b>customerId</b> and <b>productId</b> fields. This has been fixed.
36579806	In previous releases, in some cases, SNR and Threshold Breach <b>Notification</b> were not getting generated even when the required conditions were met. This has been fixed.
36511071	In previous releases, advice of charge (AoC) notification was sent only with terminate requests and was not sent out for mid-session triggers to generate a rated event. This has been fixed.
35053454	In previous releases, there was an issue when querying the grid for customer data and the Coherence grid was returning an exception. This has been fixed.
35359172	In previous releases, FUI was not triggered even if the balance was exhausted. This has been fixed.
36669103	In previous releases, Diameter Gateway was throwing an error for mapping of AVP 2050 PDN-Connection-Charging-ID. This has been fixed.
37404154	In previous releases, SLR Intermediates and STR were getting timed out intermittently at client side. This has been fixed.
37404160	In previous releases, there was a mismatch in Sy Request Error code metrics for RC 5002. This has been fixed.
37355718	In previous releases, there was no metric to capture latency of CCR-I in ECE. This has been fixed. Now new metrics type added in Diameter Gateway to capture this CCR-I latency.
37404157	In previous releases, Sy session cleanup activity caused overload in ECE. This has been fixed.
36165017	In previous releases, both current and original balances were updated. This has been fixed. Now only the current balance is updated with the impact amount, and the original balance will not be updated.

**Table 3-3 (Cont.) Customer-Reported Fixes for ECE 15.1**

Bug Number	Description
36825553	In previous releases, as the renewal was getting triggered before base free units were consumed causing rating errors. Now a custom map has been exposed in active session to assist customization in this workflow.
36581955	In previous releases, there was an error in Rated Event Formatter when non counter grant was impacted. This has been fixed.
36648956	In previous releases, ECE rating performance was impacted during CDR event processing. This has been fixed. Now performance has been improved for specific scenario where overload issue was found.
36750015	In previous releases, originalBalance in ECE cache was returned incorrectly for overage grant. This has been fixed.
37638135	In previous releases, during a MSCC request processing if there was an exception in one request, it was propagated to other requests failing the entire MSCC request. This has been fixed. Now if there is exception while processing just one of the requests, then the other requests will be processed as expected.
36531339	In previous releases, for period-based rating session end time was considered as event time and this was resulting in incorrect balance impacts. This has been fixed.
36616270	In previous releases, in SNR scenarios for the same sharing agreement, ECE was producing two SNRs in place of one - one with correct paid and the other without paid. This has been fixed.

## Customer-Reported Fixes in ECE 15.0.1

[Table 3-4](#) lists the customer-reported issues that were resolved in ECE 15.0.1.

**Table 3-4 Customer-Reported Fixes for ECE 15.0.1**

Bug Number	Description
36475576	The login ID information was populated twice in the ECE customer cache, leading to a discrepancy in reservations. This has been fixed.
36383434	In an active-active deployment of ECE, if site 1 had issues causing the SMF to route the request to site 2, HTTP Gateway instances on both site 1 and site 2 had a delayed response. This caused SMF to terminate the session without a proper error response. This has been fixed.
36531368	In an active-active deployment of ECE, the query execution was failing due to an ambiguous column error. This has been fixed.
35932874	When multiple custom notifications were generated for the same charging request, the latest notification was overwriting the previous one. This has been fixed.

Table 3-4 (Cont.) Customer-Reported Fixes for ECE 15.0.1

Bug Number	Description
36531355	The <b>customerLoader</b> utility was not working with the RAC database on a cloud native deployment. This has been fixed.
36531265	Kafka JMX metrics were not integrated with ECE metrics. This has been fixed.
36444027	ECE was not exposing the balance element name and description in the balance element cache to be used for post-rating and post-charging extensions. This has been fixed.
36100003	During the rating flow involving a discount sharing group for a nested child in the hierarchy, the balances were not getting impacted correctly. This has been fixed.
36420095	In an ECE active-active deployment, if one site went down, the state cache was federated, marking the other site's state as INITIAL, causing an outage in both sites. This has been fixed.
35655619	The validity time was incorrectly sent as zero with CCR-U being received exactly at the TTC time point. This has been fixed.
36226848 35886498	ECE was not generating a Final Unit Indicator (FUI), despite all allowances being consumed. This has been fixed.
36184594	If tax configurations were not done correctly in ECE, a NULL pointer exception was sent. This has been fixed. A detailed error message is shown.
35024526	With beat configuration in force for data usage, the GSU calculation was incorrect when the allowances were closer to depletion. This has been fixed.
35908570	With beat configuration in force for data usage, the quantity considered for rating was different from the unit credit offer purchased for the subscriber. This has been fixed.
29623177	When a discount sharing group was configured for roaming usage, ECE was not impacting the correct balances. This has been fixed.
36173763	Rated events from ECE were occasionally lost from the Rated Event Manager when aggregation of rating periods was done as an extension. This has been fixed.
36222061	In some cases, when a change bundle was triggered in BRM, incorrect offers were picked in the charging flow when processing the usage requests. This has been fixed.
35102930	With the beat rounding configured, the RUM and attribute names were not matching because the GSU was calculated incorrectly. This has been fixed.

**Table 3-4 (Cont.) Customer-Reported Fixes for ECE 15.0.1**

Bug Number	Description
33050423	When a log level was updated from JConsole, the ECS log was showing an error. This has been fixed.
30850916	When doing a rolling upgrade of the Diameter Gateway, some nodes were not restarted successfully. This has been fixed.
35839527	For the FUI redirect scenario, the validity time in the CCA was incorrect. This has been fixed.
29415790 29520574	When percentage-based discounts were configured, the discounting calculations were incorrect. This has been fixed.
36118855	With TTC configured, it was not evaluated correctly during the charging flow in some cases, leading to positive balances. This has been fixed.
36032774	For CCRs with USUs less than the last GSU, the reservation done in ECE was incorrect. This has been fixed.
36357760	ECE components were not writing the ERROR log to STDOUT/Console after enabling the subscriber tracing feature. This has been fixed.

## Customer-Reported Fixes in PDC

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications Pricing Design Center (PDC):

- [Customer-Reported Fixes in PDC 15.1](#)
- [Customer-Reported Fixes in PDC 15.0.1](#)

## Customer-Reported Fixes in PDC 15.1

[Table 3-5](#) lists the customer-reported issues that were resolved in PDC 15.1.

**Table 3-5 Customer-Reported Fixes for PDC 15.1**

Bug Number	Description
36500070	An issue with balance elements precision, when changed precision rounding is not happening properly in BRM. Issue is fixed to send correct precision values for certain objects in PDC transformation.
36352255	An error is thrown while updating the transaction_type in VERTEX_QUANTUM type to 0. An enhancement is done to PDC to support zero configuration for CODE1 and CODE2 fields
36507086	In PDC UI not able to add more than 1000 packages to package list. This has been fixed.
36586780	PDC UI throws ADF exception error while creating a new rule for USC Selector. This has been fixed.

**Table 3-5 (Cont.) Customer-Reported Fixes for PDC 15.1**

Bug Number	Description
37431227	PDC UI throws an error when browser language is set to English and create a new offer, while adding tax information in the charge details section. This has been fixed.

## Customer-Reported Fixes in PDC 15.0.1

[Table 3-6](#) lists the customer-reported issues that were resolved in PDC 15.0.1.

**Table 3-6 Customer-Reported Fixes for PDC 15.0.1**

Bug Number	Description
36178051	When searching for pricing objects in the PDC UI, an issue occurred when viewing columns in the search results. This has been fixed by removing the binding and visible properties from the search results columns.
36200892	The PDC UI was not allowing the user to create multiple Discount Rules that would use the same Discount Trigger. This has been fixed by clearing the UI cache to allow different Discount Rules to use the same Discount Trigger.
36236648	When creating a Discount Filter, if the GLID was set and then unset and the pricing name was set, an empty <code>&lt;glid&gt;&lt;/glid&gt;</code> tag was added in the export XML file, causing a null pointer exception in ECE. This has been fixed by adding NULL checks to ensure that the empty <code>&lt;glid&gt;&lt;/glid&gt;</code> tag is not NULL and its length is greater than 0.
36289593	When migrating pricing data to PDC, multiple NULL pointer errors were reported. This has been fixed.
36183071	Migration issues were reported for Batch Rating Engine wholesale configurations. This has been fixed.
36340782	When creating a charge offer with a tax exemption selector that doesn't have a service associated with it, a Null Pointer Exception was reported from the PDC UI. This has been fixed.

## Customer-Reported Fixes in Billing Care

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications Billing Care:

- [Customer-Reported Fixes in Billing Care 15.1](#)
- [Customer-Reported Fixes in Billing Care 15.0.1](#)

## Customer-Reported Fixes in Billing Care 15.1

[Table 3-7](#) lists the customer-reported issues that were resolved in Billing Care 15.1.



**Table 3-7 Customer-Reported Fixes for Billing Care 15.1.**

Bug Number	Description
37586445	Allocate Payments table doesn't show any data when navigated from unallocated payments of an account. This has been fixed.
37569365	An enhancement is made to Billing Care to allow searching accounts based on Service ID when a service has multiple aliases for a service.
37572544	While opening AR action details from Newsfeed, Billing Care was throwing console error "dateConverter is not defined". This has been fixed.
37473243	Wrong expiry date is displaying for manual discounts in asset section. Timezone offset JSON which is coming from REST is not sorted. This has been fixed.
36853154	There was an issue when custom messages are added in newsfeed reason codes file were not appearing in the newsfeed table on UI for any AR actions. This issue is fixed now. Now any additional/custom strings added in PIN_FLD_MESSAGE will appear in the Newsfeed table as expected.
37387552	In Billing Care Application when we click on non currency resources the pop-up is not displaying properly , the pop-up size is very big when as compare to BRM12 and the arrow is also not pointing to the non currency resource block. This has been fixed.
37411978	Settlement of Grant full and deny of disputes is not working as the amount field is missing while invoking the fm_ar_event_settlement input flist. This has been fixed.
37294560	Improper Display of Error Message While Performing Refund through Billing Care is resolved.
37206352	NewsFeed Recurring Charge Link is redirecting to Account Charges instead of Subscription. This has been fixed.
37232898	Billing Care Error in 'Records in Batch' when clicking the 'Validate' button. When a custom reversal was being made using Billing Care, in some cases conditional logic was searching for payment in /event/billing/charge table instead of /event/billing/payment. I have modified the conditional logic for custom payments to search for payment in correct table
37146842	While performing Event Adjustment % symbol was not being displayed. This has been fixed.
36724768	Unable to process refund when specified using ITEMS[] instead of ITEM_OBJ. This issue is fixed now. Billing Care will first check ITEM_OBJ for individual refunds. If ITEM_OBJ is null, it will process refunds using ITEMS[].
32772351	Enhancement is made to display/search of alias_list values other than 0th index.
36757363	Scroll bar is missing on Payment Details screen in Billing care 15. Scroll bars have been added to the Payment Details and Make Payment dialogs to ensure that the footer sections and buttons remain visible to the user.
36732558	When trying to change Prepaid Lifecycle State from ACTIVE to RECHARGEONLY through BillingCare, getting the following error and the action freezes: "Cannot deserialize value of type `int` from String "ui-id-15": not a valid `int` value". This has been fixed.
36337328	Event view is getting distorted & "Show More" button is not visible. This has been fixed.

**Table 3-7 (Cont.) Customer-Reported Fixes for Billing Care 15.1.**

Bug Number	Description
36541425	Comments/notes from billing care batch payment file not appear in detail page . comments from the batch file will be stored in "/event/billing/payment/PAYMENT_METHOD" in the "PIN_FLD_DESCR" field of the respective payment.
36549679	When the "Add Filters" button was being clicked for "Collections", the resulting filter dialogue box was overflowing for some resolutions resulting in the above issue. This issue is fixed now. Modified the filter dialogue box's position and size and added a scroll bar to prevent this issue from recurring.

## Customer-Reported Fixes in Billing Care 15.0.1

[Table 3-8](#) lists the customer-reported issues that were resolved in Billing Care 15.0.1.

**Table 3-8 Customer-Reported Fixes in Billing Care 15.0.1**

Bug Number	Description
36493186	Memory leaks were detected during the Get Bill Unit Summary for an Account API call. This has been fixed.
36486781	After the deployment of a patch, the due amount was not being displayed properly in the Billing Care <b>Switch Bills</b> area. Additionally, when Bill Now was run for the first time, the bill did not contain the due amount. However, the bills generated after you ran Bill Now did contain the due amount. This has been fixed.
36441031	A parent account's past due of its intermediate bills displayed only its own due and did not include its children's due. This has been fixed.
36289159	In the Billing Care AR actions settlement dialog box, the note's comments link would get overshadowed by the <b>OK</b> and <b>Cancel</b> buttons, preventing the addition of further notes. This has been fixed. A vertical scroll bar has been added to the comment link to enable the addition of more notes.
36169195	The quantity field of the purchase API did not take decimal values. Due to this, the user was unable to purchase a partial quantity. This has been fixed.
36118752	The Billing Care REST API was failing to retrieve the asset details for services with newly added BRM fields with field numbers greater than 1,000,000. This has been fixed.
35964173	Event details in Billing Care UI did not appear properly upon clicking <b>Show More</b> . This has been fixed.
35953767	The correct event dispute settled date was not visible. This has been fixed.

**Table 3-8 (Cont.) Customer-Reported Fixes in Billing Care 15.0.1**

Bug Number	Description
36275014	Billing Care was storing the billingcare pod's IP address instead of the actual CSR machine's IP address in the PIN_FLD_NAP_IP_ADDRESS field of the <b>/user_activity</b> object. This has been fixed. Billing Care now uses the X-Forwarded-For header value for the actual CSR machine's IP address. In addition, you can use the Billing Care SDK to customize the behavior for setting values in the <b>/user_activity</b> object. See " <a href="#">Tracking CSR Activity for Audit Purposes</a> " for more information.
35937051	The PROGRAM_NAME field was not being sent to the BRM server from Billing Care. This has been fixed. The program name has now been set to <b>BillingCare</b> when accessed via Billing Care. The program name has been set to <b>BillingCareREST</b> when accessed via REST APIs.

## Customer-Reported Fixes in Business Operations Center

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications Business Operations Center:

- [Customer-Reported Fixes in Business Operations Center 15.1](#)
- [Customer-Reported Fixes in Business Operations Center 15.0.1](#)

## Customer-Reported Fixes in Business Operations Center 15.1

[Table 3-9](#) lists the customer-reported issues that were resolved in Business Operations Center 15.1.

**Table 3-9 Customer-Reported Fixes for Business Operations Center 15.1**

Bug Number	Description
XXXX	XXXX This has been fixed.

## Customer-Reported Fixes in Business Operations Center 15.0.1

No customer-reported issues were resolved in Business Operations Center 15.0.1.

## Customer-Reported Fixes in BRM Thick Clients

See the following for a list of customer-reported issues that were fixed for each release of Oracle Communications BRM thick clients:

- [Customer-Reported Fixes in BRM Thick Clients 15.1](#)
- [Customer-Reported Fixes in BRM Thick Clients 15.0.1](#)

## Customer-Reported Fixes in BRM Thick Clients 15.1

[Table 3-10](#) lists the customer-reported issues that were resolved in the 15.1 release of the BRM thick clients.

**Table 3-10 Customer-Reported Fixes in BRM Thick Clients 15.1**

Bug Number	Description
36971995	Update Number Category is not working in Number Administrator Tool. This has been fixed.

## Customer-Reported Fixes in BRM Thick Clients 15.0.1

[Table 3-11](#) lists the customer-reported issues that were resolved in the 15.0.1 release of the BRM thick clients.

**Table 3-11 Customer-Reported Fixes in BRM Thick Clients 15.0.1**

Bug Number	Description
36343237	The user was unable to change the currency symbol in Payment Center. This has been fixed.
36293588	When events were sorted in Event Browser in Customer Center, if the user would navigate to the marked events screen and then to the event browser screen, the table would no longer be sorted as it was previously. This has been fixed.
36118751	In Customer Center, during the account creation flow, the cycle start relative flag in the product's plans tab screen was not active. This has been fixed.

# 4

## New Cloud Native Features

Learn about the new features in the Oracle Communications Billing and Revenue Management (BRM) cloud native deployment option.

Topics in this document:

- [New Features in Cloud Native 15.1](#)
- [New Features in Cloud Native 15.0.1](#)
- [New Features in Cloud Native 15.0.0](#)

### New Features in Cloud Native 15.1

BRM cloud native 15.1 includes the following enhancements:

- [BRM Cloud Native Pods Now Use Dynamic Volume Provisioning](#)
- [Default Service Type Changes in BRM Cloud Native](#)
- [All Cloud Native Containers Now Support Requests and Limits](#)
- [BRM Cloud Native Now Supports Using External Kubernetes Secrets](#)
- [Improved Processing of Realtime Pipeline Semaphore Files](#)
- [ECE Cloud Native Now Allows Configuration of Journal Space](#)
- [oc-cn-init-db-helm-chart Can Now Configure the Database For You](#)

### BRM Cloud Native Pods Now Use Dynamic Volume Provisioning

BRM cloud native pods now use dynamic volume provisioning by default. However, you can modify one or more pods to use static volumes instead to meet your business requirements. To do so, add the **createOption** key to the **override-values.yaml** file for each pod for which you want to use static volumes and then redeploy your Helm charts.

For information about changing dynamic volume provisioning to static volume provisioning, see "Using Static Volumes" in *BRM Cloud Native System Administrator's Guide*.

### Default Service Type Changes in BRM Cloud Native

The default service types of several BRM cloud native services have been changed.

[Table 4-1](#) lists the cloud native services that are now deployed as ClusterIP by default, but were deployed as NodePort in previous releases.

Table 4-1 Services Now Deployed as ClusterIP

Service Name	Description of Change
<b>brm-rest-services-manager</b>	BRM REST Services Manager creates ClusterIP by default. To deploy this service as NodePort instead, set the <b>ocrsm.rsm.service.type</b> key to <b>NodePort</b> in your <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>pdcrsm</b>	This service is now deployed as ClusterIP by default. To deploy this service as NodePort instead, set the <b>ocpdcrsm.service.type</b> key to <b>NodePort</b> in your <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>wsm-tomcat</b>	This service is now deployed as ClusterIP by default. To deploy the service as NodePort instead, set the <b>ocbrm.wsm.deployment.tomcat.service.type</b> key to <b>ClusterIP</b> in your <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .

Table 4-2 lists the cloud native services that are no longer deployed as NodePort by default. You use a different cloud native service to deploy with a ClusterIP service type.

Table 4-2 NodePort Services No Longer Created By Default

Service Name	Description of Changes
<b>bcws-domain-admin-server-ext</b>	Billing Care REST API no longer creates the NodePort external service ( <b>bcws-domain-admin-server-ext</b> ) by default. You can use the ClusterIP service ( <b>bcws-domain-admin-server</b> ) instead. To configure Billing Care REST API to create the NodePort external service, set the <b>ocbc.bcws.wop.adminChannelPort</b> key to the NodePort where the admin-server's HTTP service will be accessible. You must set this key in the <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>billingcare-domain-admin-server-ext</b>	Billing Care no longer creates the NodePort external service ( <b>billingcare-domain-admin-server-ext</b> ) by default. You can use the ClusterIP service ( <b>billingcare-domain-admin-server</b> ) instead. To configure Billing Care to create the NodePort external service, set the <b>ocbc.bc.wop.adminChannelPort</b> key to the NodePort where the admin-server's HTTP service will be accessible. You must set this key in the <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>boc-domain-admin-server-ext</b>	Business Operations Center no longer creates the NodePort external service ( <b>boc-domain-admin-server-ext</b> ) by default. You can use the ClusterIP service ( <b>boc-domain-admin-server</b> ) instead. To configure Business Operations Center to create the NodePort external service, set the <b>ocboc.boc.wop.adminChannelPort</b> key to the NodePort where the admin-server's HTTP service will be accessible. You must set this key in the <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .

Table 4-2 (Cont.) NodePort Services No Longer Created By Default

Service Name	Description of Changes
<b>brmdomain-admin-server-ext</b>	BRM Web Services Manager no longer creates the NodePort external service ( <b>brmdomain-admin-server-ext</b> ) by default. You can use the ClusterIP service ( <b>brmdomain-admin-server</b> ) instead.  To configure BRM Web Services Manager to create the NodePort external service, set the <b>ocbrm.wsm.deployment.weblogic.adminServerNodePort</b> key to the NodePort where the admin-server's HTTP service will be accessible in your <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>pcc-domain-admin-server-ext</b>	Pipeline Configuration Center no longer creates the NodePort external service ( <b>pcc-domain-admin-server-ext</b> ) by default. You can use the ClusterIP service ( <b>pcc-domain-admin-server</b> ) instead.  To configure Pipeline Configuration Center to create the NodePort external service, set the <b>ocpcc.pcc.wop.adminChannelPort</b> key to the NodePort where the admin-server's HTTP service will be accessible. You must set this key in the <b>override-values.yaml</b> file for <b>oc-cn-helm-chart</b> .
<b>pdcc-service</b>	PDC no longer creates the NodePort external service ( <b>pdcc-service</b> ) by default.  To configure PDC to create the NodePort external service, set the <b>ocpdcc.service.type</b> key to <b>NodePort</b> in your <b>override-values.yaml</b> file for <b>oc-cn-op-job-helm-chart</b> .

## All Cloud Native Containers Now Support Requests and Limits

All BRM cloud native containers now support the setting of minimum and maximum CPU and memory values. This feature helps prevent containers from consuming too many resources, which can lead to system crashes.

For more information, see "Setting Minimum and Maximum CPU and Memory Values" in *BRM Cloud Native System Administrator's Guide*.

## BRM Cloud Native Now Supports Using External Kubernetes Secrets

You can now create BRM cloud native KeyStore certificates as Kubernetes Secrets in two different ways:

- Pre-create the BRM cloud native KeyStore certificates as Secrets in the Kubernetes cluster. Pre-creating the Kubernetes Secrets eases maintenance because it allows you to replace KeyStore certificates without updating the **values.yaml** files and performing a Helm install or upgrade.
- Have the BRM cloud native installer create the Kubernetes Secrets for you. In this case, you store the KeyStore certificates in the cloud native Helm charts. During the Helm install or upgrade process, the KeyStores are created as Kubernetes Secrets, which eventually end up as Secrets in the Kubernetes cluster.

In previous releases, you could only store the certificates in the Helm charts.

For more information, see "About Using External Kubernetes Secrets" in *BRM Cloud Native System Administrator's Guide*.

## Improved Processing of Realtime Pipeline Semaphore Files

BRM cloud native now processes semaphore files more efficiently when it contains multiple realtime-pipe pod replicas. Semaphore files are now processed by one replica at a time. For example, assume your cloud native deployment contains multiple replicas of the realtime-pipe pod. When a semaphore file is placed in the common-semaphore PVC directory, one realtime-pipe replica picks up and locks the file. After it finishes processing the file, the replica unlocks it so the next replica can pick up, lock, and process it. This process continues until all replicas have processed the semaphore file.

In previous releases, all realtime-pipe replicas processed the semaphore file in parallel.

You enable realtime-pipe to process semaphore files one replica at a time by setting the **TimeBasedChecking** key to **true** in your wirelessrealtime-reg-config ConfigMap. By default, this key is set to **true**.

The realtime-pipeline pod uses Kubernetes liveness probes to monitor the container and automatically restart it when problems occur. You configure how often the liveness probe checks the container and when to perform restarts using the following keys in your **oc-cn-helm-chart/templates/realtime\_pipeline.yaml** file:

- **LivenessProbe.initialDelaySeconds**: Specifies how long to wait in seconds before performing the first liveness probe. Ensure this value is equal to or longer than the semaphore processing time. The default is 10.
- **LivenessProbe.periodSeconds**: Specifies the interval in seconds between performing liveness probes. Ensure this value is equal to or longer than the semaphore processing time. The default is 10.
- **LivenessProbe.failureThreshold**: Specifies the number of times the liveness probe can fail before triggering a container restart. The default is 2.



### Note:

If you set **periodSeconds** to a value less than the semaphore processing time, you must set **failureThreshold** to a higher value to prevent unnecessary restarts of the realtime-pipe pod.

## ECE Cloud Native Now Allows Configuration of Journal Space

You can now control the amount of space in ECE cloud native deployments that the Oracle Coherence Elastic Data journals use to meet your business needs. By default, ECE cloud native creates journal space for small-to-medium-sized deployments with up to 20,000 TPS. For larger deployments, you may need to increase the size of the journal space.

For more information, see "Managing ECE Journal Storage" in *BRM Cloud Native System Administrator's Guide*.

## oc-cn-init-db-helm-chart Can Now Configure the Database For You

The **oc-cn-init-db-helm-chart** can now automatically configure your BRM database for demonstration or development systems. To do so, you must set the following keys in your **override-values.yaml** file before deploying the Helm chart:



- **db.user:** The user name of the system administrator.
- **db.password:** The password for the system administrator.
- **db.port:** The port number of the database server.

**Note:**

For production systems, your database administrator must create the BRM database manually.

For more information, see "Deploying BRM with a New Database Schema" in *BRM Cloud Native Deployment Guide*.

## New Features in Cloud Native 15.0.1

BRM cloud native 15.0.1 includes the following enhancements:

- [PDC Deployment Creates Default PDC Groups](#)
- [PCC Now Supports WebLogic Kubernetes Operator](#)
- [Cloud Native Documentation Contains New Instructions](#)

### PDC Deployment Creates Default PDC Groups

When you deploy the **oc-cn-op-job-helm-chart** Helm chart to create the PDC WebLogic domain, it now creates the following PDC groups:

- **PricingDesignAdmin:** This group's users have administrative privileges on PDC. They can perform operations on all PDC UI screens, pricing components, and setup components.
- **PricingAnalyst:** This group's users have administrative privileges for pricing components and view-only privileges for setup components.
- **PricingReviewer:** This group's users have view-only privileges for all pricing and setup components.

When you create PDC users, you add them to one of these groups to control their access to PDC operations. For example, to create a user that can perform all operations in PDC, you can configure these new **values.yaml** keys for the **oc-cn-op-job-helm-chart** Helm chart:

```
ocpdc:
  wop:
    users:
      name: JohnDoeAdmin
      description: New Pricing Administrator
      password: EncodedPassword
      groups: PricingDesignAdmin
```

For information, see "Creating PDC Users" in *BRM Cloud Native System Administrator's Guide*.

### PCC Now Supports WebLogic Kubernetes Operator

PCC now supports WebLogic Kubernetes Operator for its cloud native deployment.

For more information on the configuration and testing of the PCC's integration with the WebLogic Operator for cloud-native environment (CNE) deployment, see "Configuring Pipeline Configuration Center" in the *BRM Cloud Native Deployment Guide*.

## Cloud Native Documentation Contains New Instructions

The BRM cloud native documentation has been updated to include instructions for doing the following:

- Optimizing the PDC system's CPU and memory usage for requests and limits during runtime. See "Using Resource Limits in PDC Domain Pods" in *BRM Cloud Native System Administrator's Guide*.
- Changing the language displayed in your PDC UI screens, XML import files, and XML export files. See "Managing Language Packs in PDC Pods" in *BRM Cloud Native System Administrator's Guide*.
- Migrating PDC from an on-premises release to a cloud native release. See "Migrating from PDC On Premises to PDC Cloud Native" in *BRM Cloud Native Deployment Guide*.
- Setting up ingress and egress flows for ECE cloud native deployments. See "Setting Up ECE Cloud Native Ingress and Egress Flows" in *BRM Cloud Native Deployment Guide*.
- Performing a zero-downtime upgrade of a BRM cloud native active-active disaster recovery system. See "Performing Zero-Downtime Upgrades of Disaster Recovery Cloud Native Systems" in *BRM Cloud Native Deployment Guide*.
- Creating, editing, deleting, and retrieving custom storable classes and storable class fields in your BRM cloud native database. See "Creating Custom Fields and Storable Classes" in *BRM Cloud Native System Administrator's Guide*.



### Note:

These instructions apply to Release 15.0.0 or later.

## New Features in Cloud Native 15.0.0

BRM cloud native 15.0.0 includes the following enhancements:

- [Images Now Available on Oracle Container Registry](#)
- [BRM Cloud Native Enhancements](#)
- [Changing ECE Configuration During Runtime](#)
- [PDC Cloud Native Deployment Enhancements](#)

### Images Now Available on Oracle Container Registry

BRM cloud native images are now available on Oracle Container Registry (<https://container-registry.oracle.com>).

For more information, see "Pulling BRM Images from the Oracle Container Registry" in *BRM Cloud Native Deployment Guide*.

## BRM Cloud Native Enhancements

BRM cloud native includes the following enhancements:

- BRM cloud native now supports Podman for building container images.
- The real-time and batch rating engines now support SSL-enabled communication with BRM.
- BRM cloud native now supports the BRM SDK, which allows you to make and compile customizations for your BRM system.

For more information, see *BRM Cloud Native Deployment Guide*.

## Changing ECE Configuration During Runtime

You can now use Kubernetes jobs to do the following during ECE runtime without requiring you to restart ECE pods:

- Reload configuration information from the **charging-settings.xml** file into ECE cache
- Change grid-level logging options

For more information, see "Changing the ECE Configuration During Runtime" in *BRM Cloud Native System Administrator's Guide*.

## PDC Cloud Native Deployment Enhancements

PDC cloud native includes the following enhancements:

- Deploying and configuring Pricing Design Center cloud native services no longer requires manual post-installation tasks. These tasks are now automated in the PDC cloud native deployment process.
- PDC cloud native images have been decoupled from Fusion Middleware images, reducing the overall size of the PDC images. To use PDC cloud native, you now download the Fusion Middleware images and provide their location in your PDC **override-values.yaml** file.

For more information, see "Configuring Pricing Design Center" in *BRM Cloud Native Deployment Guide*.

# 5

## New Features in BRM

Learn about the new features in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Features in BRM 15.1](#)
- [New Features in BRM 15.0.1](#)
- [New Features in BRM 15.0.0](#)

### New Features in BRM 15.1

BRM 15.1 includes the following enhancements:

- [Web Services Manager No Longer Requires Deployment in an External Application](#)
- [General Ledger IDs Can Now Be Associated With Tax Codes](#)
- [Enhancement to pin\\_cycle\\_fees](#)
- [BRM Now Supports Modifying the Maximum Length of an Opcode Flist Field](#)
- [Asynchronous Change in the Billing Day of Month for Large Hierarchies](#)
- [BRM Can Now Generate Proforma Invoices](#)
- [Enhancement to Business Event Mapping and Publisher Definitions](#)
- [New Attributes to Define Events and Elements](#)
- [C-Based BRM Applications Now Support pinlog Rotation](#)
- [BRM REST API Endpoints Updated](#)
- [Wholesale Sharing Group Performance Improvements](#)

### Web Services Manager No Longer Requires Deployment in an External Application

In previous versions, the BRM Web Services Manager was deployed into an external server, such as Oracle WebLogic Server or Tomcat. Now, a standalone version of the Web Services Manager is available. This provides the following benefits:

- Simplifies deployment and customization.
- Improves performance and execution times.
- Removes dependency on external applications and total cost of ownership.
- Provides improved testing capabilities.

Support has not been removed for the older type of Web Services Manager, so you can continue to deploy it into WebLogic Server or Tomcat if that best meets your business needs. Support for this option may be removed in future releases, however.

For more information, see *BRM Web Services Manager*.

## General Ledger IDs Can Now Be Associated With Tax Codes

You can now associate general ledger IDs (G/L IDs) with tax codes in PDC. For more information, see "Creating Tax Codes" in *PDC Online Help* and "Creating Tax Codes" in *BRM Calculating Taxes*.

## Enhancement to `pin_cycle_fees`

The **`pin_cycle_fees`** utility has been enhanced to support the splitting of events for backdated operations. When the backdate window includes multiple billing cycles, the **`pin_cycle_fees`** utility splits the events by cycle and applies the charges individually for each cycle based on the backdated activity.

For more information, see "Prorating Cycle-Forward Fees and Canceling Charge Offers By Using the `pin_cycle_fees` Utility" and "`pin_cycle_fees`" in *BRM Configuring and Running Billing*.

## BRM Now Supports Modifying the Maximum Length of an Opcode Flist Field

You can now modify or validate the maximum length of an opcode flist field for an existing opcode or create a loadable opcode specification for a custom opcode using the **`generate_config_xml_from_opcode_spec.py`** script.

For more information, see "Modifying the Maximum Length of an Opcode Flist Field" in *BRM Developer's Guide*.

## Asynchronous Change in the Billing Day of Month for Large Hierarchies

BRM now allows you to change the billing day of month (DOM) for the parent accounts and child accounts asynchronously by performing parallel updates for all accounts in a large hierarchy. This avoids locking the parent account, which restricted any other operations during the update process.

For information, see "About Changing the Billing Day of Month for Large Hierarchies" in *BRM Configuring and Running Billing*.

## BRM Can Now Generate Proforma Invoices

Before generating a final invoice, you can now create a proforma invoice, which is an initial, optional step in the billing process. It is similar to final billing, however, it does not finalize the bill. It creates a pre-invoice that your customers can review for accuracy before the final bill and invoice are generated. Afterward, your customers can manually accept or reject the proforma invoice. For more information, see "Generating Proforma Invoices" in *BRM Designing and Generating Invoices*.

## Enhancement to Business Event Mapping and Publisher Definitions

You can now map business events to database queues based on the value of a new **TAG** token and specify to publish business events to multiple database queues. For more information, see "Mapping Business Events to Database Queues" in *BRM System Administrator's Guide*.

You can also have multiple definitions for the same publisher, but with different output format. For more information, see "Publisher Definitions" in *BRM Developer's Guide*.

## New Attributes to Define Events and Elements

The following new attributes have been introduced to define events and elements:

1. **PcmOpFlag**: Specifies an optional field that stores the flag value to run the PCM\_OP\_READ\_FLDS or PCM\_OP\_READ\_OBJ opcode.
2. **ReadFlds**: Specifies to read one or more fields in an object from the transaction cache or, if it is not in the cache, from the BRM database.
3. **ElemId**: Specifies to read a specific array element.
4. **ReadObj**: Specifies to read an entire object from the transaction cache or, if it is not in the cache, from the BRM database.
5. **ReadValFrom**: Specifies an optional attribute that retrieves an object POID (**ObjPoid**) from a specific array in the incoming opcode flist.

For more information, see "Syntax of Elements and Attributes " in *BRM Developer's Guide*.

## C-Based BRM Applications Now Support pinlog Rotation

You can now configure individual C-based BRM applications to rotate their **pinlog** files. The files can be rotated based on:

- The length of time the **pinlog** file has been open, such as every 3 days at 05:00
- The **pinlog** file's size, such as 50 MB

You can also combine the rotation schemes (use time and file size to rotate files), such as 50 MB files open for 3 days closed at 05:00.

For more information, see "Rotating Log Files for C/C++-Based Applications" in *BRM System Administrator's Guide*.

## BRM REST API Endpoints Updated

The following BRM REST API endpoints have been updated in the 15.1 release:

- The Get Payment Methods and Get Payment Methods for an Account endpoints now support the **name** and **invoice.name** query parameters
- The Get an Applied Customer Billing Rate by ID and Get Applied Customer Billing Rates endpoints now support the **bill.id** query parameter

For more information, see [REST Services Manager API for Billing and Revenue Management](#).

## Wholesale Sharing Group Performance Improvements

You can now improve the performance of rolling up balances from sharing group members to the owner's bill unit by doing the following:

- Enabling the sharing roll-up functionality. You enable this functionality when you create or modify a wholesale sharing group.
- Running the new **pin\_rollup\_sharing\_balances** utility. This multithreaded utility launches a separate thread to roll up each member's noncurrency balance to the owner.

Previously, the owner of the sharing group was locked during each member's billing, which led to contentions. Now, the owner is not locked during member billing, and the roll up of balances from members to the owner happens during owner billing.

For more information, see "Rolling Up Balances from Members to Owners for Wholesale Sharing Groups" in *BRM Configuring and Running Billing*.

## New Features in BRM 15.0.1

BRM 15.0.1 includes the following enhancements:

- [Contract Management Now Independent of Deliverable-Based Revenue Recognition](#)
- [Contract Management Enhancements](#)
- [Flist Management Macros Now Include Compile-Time Flags](#)
- [Invoice Documents Can Now be Generated for Custom Criteria](#)
- [Itemized Tax Calculation for Disputes and Settlements](#)
- [Triggering Either In-Advance or Post-Expiration Notifications](#)
- [Trial Billing Support for Subset of Child and Parent Accounts in a Wholesale Hierarchy](#)
- [Processing an Account's Charge Offer Using the pin\\_cycle\\_fees Utility](#)

## Contract Management Now Independent of Deliverable-Based Revenue Recognition

You can now create contracts regardless of the revenue recognition scheme your BRM system uses. In previous releases, you could create contracts only if deliverable-based revenue recognition was enabled. Deliverable-based revenue recognition aligns with the ASC 606 and IFRS 15 accounting standards. For information, see "Managing Customer Contracts" in *BRM Managing Customers*.

In addition, contract management now supports the following operations:

- Performing backdated operations
- Using multiple G/L segments
- Using Conversion Manager
- Performing rerating
- Using the Web Services Manager opcodes
- Performing accounts receivable (A/R) operations, such as adjustments



### Note:

Contract management does not support these operations when deliverable-based revenue recognition is enabled. See "Enabling Deliverable-Based Revenue Recognition" in *BRM Collecting General Ledger Data*.

## Contract Management Enhancements

BRM now supports the following contract management enhancements:

- **Specifying a minimum contract length:** You can now specify a minimum length for a contract with corresponding penalty charges for early cancellation. If customers cancel early, they must pay the remaining balance up to the minimum contract length. See "About Penalty Fees" in *PDC Creating Product Offerings* for more information.

For example, assume a subscription term has a 1-year commitment period, a minimum contract length of 4 months, and a \$50 monthly fee. Customers would be charged \$50 for each month remaining in the 4-month minimum contract length. A customer canceling after 1 month would pay \$150, and a customer canceling after 3 months would pay \$50. A customer canceling after 6 months would pay \$0 because they already paid the 4-month minimum.

- **Applying penalty fees:** The penalty fee can now consist of an early termination fee, the remaining contract balance, or both. See "About Penalty Fees" in *PDC Creating Product Offerings* for more information.

In previous releases, the penalty fee could be an early termination fee or the contract balance. You could not apply both.

- **Extending the /subscriber\_contract storable class:** You can now extend the `/subscriber_contract` storable class to store additional fields. To do so, see "Extending Subscriber Contracts" in *BRM Opcode Guide*.
- **Customizing how penalty fees are applied during cancellation:** You can use the new `PCM_OP_CONTRACT_POL_CANCEL_CONTRACT` policy opcode to customize how penalty fees are calculated and applied during the contract cancellation process.

## Flist Management Macros Now Include Compile-Time Flags

When calling the PUT flist management macros, you can now set compile-time flags in your custom code's Makefile. The compile-time flags specify to automatically set source pointers to NULL during PUT operations and assign a NULL value to an flist or object after the macro call, preventing it from being destroyed in the future.

[Table 5-1](#) lists each flist management macro, its compile-time flag, and what happens after the macro is called with the flag.

**Table 5-1 New Compile-Time Flags for Flist Management Macros**

Flist Macro Name	Compile-Time Flag	After Macro Call
PIN_FLIST_FLD_PUT	- DASSIGN_NULL_AFTER_FLD_PUT	<b>valp</b> changed to NULL
PIN_FLIST_ELEM_PUT	- DASSIGN_NULL_AFTER_ELEM_PUT	<b>elem_flistp</b> changed to NULL
PIN_FLIST_SUBSTR_PUT	- DASSIGN_NULL_AFTER_SUBSTR_PUT	<b>substr_flistp</b> changed to NULL

For information, see "Using Compile-Time Flags to Avoid Errors in Flists" in *BRM Developer's Guide*.



## Invoice Documents Can Now be Generated for Custom Criteria

You can generate invoice documents for invoices that meet your custom criteria, such as only for Canadian customers with an invoice delivery type of email. You specify the criteria using a list of key-value pairs, which correspond to parameters you add to the data model defining the requirements for selecting invoices.



### Note:

With custom criteria, the selected invoices are split into batches, and one job is scheduled for each batch using the bursting mode.

For information, see "Generating Invoice Documents Based on Custom Criteria" in *BRM Designing and Generating Invoices*.

## Itemized Tax Calculation for Disputes and Settlements

BRM can now calculate the tax settlement details when a dispute or settlement is performed for a bill, item, or event, allowing you to know how much tax is being settled per jurisdiction.

You can configure BRM to segregate the tax amount for each dispute and settlement based on the tax code and tax jurisdiction by setting the **TaxReturnJuris** business parameter to **itemize**. By default, the parameter is set to **summary**, which specifies to segregate the tax amount based on the tax code. For information, see "Configuring Itemized Taxation for A/R and Payments" in *BRM Calculating Taxes*.

In addition, the PCM\_OP\_GET\_ITEM\_DETAILS opcode has been enhanced to show the settled tax and settled taxed amounts based on the tax code and jurisdiction level for each item. For information, see "About the Item Data Retrieved" in *BRM Opcode Guide*.

## Triggering Either In-Advance or Post-Expiration Notifications

When setting up your system to send messages to customers through an external application, you can now configure BRM to trigger notifications before an event occurs, after an event occurs, or both. This applies to the following:

- **Balance elements:** You can configure any currency or noncurrency balance element to trigger notification events when its validity period is about to expire, when it has already expired without new funds being added, or for both.
- **Product expiration:** You can configure a subscription to trigger notification events before the subscription expires, after the subscription expires, or for both.
- **Subscription renewals:** You can configure a subscription to trigger notification events before it is due for renewal, after it is past due for renewal, or for both.

In previous releases, in-advance and post-expiration notifications were either both enabled or both disabled.

For information, see "Configuring BRM to Send Notifications to External Notification Applications" in *BRM Managing Customers*.

## Trial Billing Support for Subset of Child and Parent Accounts in a Wholesale Hierarchy

In wholesale bill unit hierarchies, you can now trigger trial billing for:

- All child accounts under a specific parent billing account and the parent billing account
- Specific child accounts alone under a parent billing account
- Specific parent billing account alone skipping the check on whether trial billing is performed for all child accounts under the parent billing account

Prior to this release, trial billing had to be performed for all child accounts and then for all parent accounts.

For information, see "Running Trial Billing" in *BRM Configuring and Running Billing*.

## Processing an Account's Charge Offer Using the `pin_cycle_fees` Utility

The **`pin_cycle_fees`** utility now processes only the charge offers for which it is called. Earlier, **`pin_cycle_fees`** used to process all charge offers, even when it was called for a specific charge offer. For more information, see "Canceling an Account's Charge Offer Using `pin_cycle_fees` Utility" in *BRM Configuring and Running Billing*.

## New Features in BRM 15.0.0

This section lists the features introduced between BRM 12.0 Patch Set 8 and BRM 15.0.0.

For information about the features introduced between BRM 12.0 and BRM 12.0 Patch Set 8, see "[New Features in BRM](#)" in *BRM 12.0 Patch Set Release Notes*.

BRM 15.0.0 includes the following enhancements:

- [64-Bit Support for All BRM Components](#)
- [Supported Upgrades to Release 15.0](#)
- [Support for Purchasing Same Product or Discount Multiple Times with Separate Balances](#)
- [BRM REST Services Manager API Supports Order Bill Fulfillment](#)
- [Pipeline Rating Supports SSL Connection to BRM](#)
- [Support for Full-Day Discounts](#)
- [Improved Timeout Consistency](#)
- [Improved Synchronization Between BRM and External CRM Applications](#)
- [BRM CM Now Supports Authorization](#)
- [Improved POID Caching](#)
- [Simplified BRM Multischema Installation](#)
- [BRM Supports Validation for Dynamic Charging](#)
- [Conversion Manager Supports All New Functionality](#)

## 64-Bit Support for All BRM Components

All former BRM 32-bit components, such as the Connection Manager (CM), are now 64-bit components. In addition, you can now use all timestamps representing a date after January 19, 2038.



### Note:

Support extends to all BRM, Pricing Design Center, Business Operations Center, Billing Care, and Elastic Charging Engine components.

If you are upgrading to BRM 15.0, you need to recompile any BRM customizations, such as policy opcodes, as 64-bit extensions. For more information, see "Migrating Custom Code to a 64-bit Environment" in *BRM Installation Guide*.

## Supported Upgrades to Release 15.0

The following upgrade paths to the 15.0 release are supported:

- BRM 12.0 to BRM 15.0
- Any BRM 12.0 Patch Set to BRM 15.0
- ECE 12.0 to ECE 15.0
- Any ECE 12.0 Patch Set to ECE 15.0

The upgrade paths support the following on-premise and cloud native versions:

- On-premise versions of BRM with an ECE charging engine to a 15.0 version
- On-premise versions of BRM with real-time and batch rating engines to a 15.0 version
- BRM cloud native with an ECE charging engine to a 15.0 version
- BRM cloud native with real-time and batch rating engines to a 15.0 version
- On-premise versions of BRM with real-time and batch rating engines to BRM cloud native 15.0 with real-time and batch rating engines

## Support for Purchasing Same Product or Discount Multiple Times with Separate Balances

Previously, customers could extend the validity of a balance by purchasing a product or discount again, and the new balance was added to the existing balance. Now, you can track the new and existing balances separately, with separate validity dates.

You can use two new options with the **loadpricelist** utility. When creating deals in your XML file, you set the value for the **<purchase\_mode>** element under the **<deal\_product>** or **<deal\_discount>** element. You can set the purchase mode to:

- **4:** Longest date. Extends the old subscription with a separate balance, setting the validity end date to whichever is later, the new or existing validity.
- **5:** Cumulative validity. Extends the old subscription with a separate balance, setting the validity end date by adding the new validity to what remains of the old validity.

For example, on June 1, a customer purchases a deal that grants 3GB of data, is valid for seven days, and has a grace period of 4 days. On June 3, after using 1GB, they purchased the deal again. With both options, the new 3GB balance is added to a new balance group, separate from the remaining 2GB in the old balance group.

With option 4, the new balance is valid starting on June 3, and BRM compares the validity periods of the old and new balances to set the validity end date for the new balance to the later of the two end dates, June 10. The old balance retains the original validity dates.

With option 5, the new balance is valid starting on June 8. BRM adds what remains of the validity period of the old balance to the new balance to set the validity end date for the new balance to June 15. The old balance retains the original validity dates.

For information, see "Purchasing the Same Product or Discount Multiple Times" in *BRM Setting Up Pipeline Pricing*.

## BRM REST Services Manager API Supports Order Bill Fulfillment

The BRM REST Services Manager API now supports the following order bill fulfillment operations:

- Purchasing a product offering, such as a bundled offer, charge offer, or discount offer
- Suspending a purchased service
- Resuming a suspended service
- Terminating a purchased product offering

You can also specify to cancel a customer's service in the future.

If you support two-phase billing, you can specify whether to purchase an offer with the start date set to 365 days in the future or to the actual activation date.

You implement order bill fulfillment using the new Perform Billing Fulfillment operation in the BRM REST Services Manager API. For more information, see *REST Services Manager API for Billing and Revenue Management*.



### Note:

The order bill fulfillment operations are based on the TMF 622 Product Ordering API and cover the bill fulfillment-related tasks of the product ordering flow.

The order bill fulfillment operations also support extending the framework by adding attributes to the request payload.

## Pipeline Rating Supports SSL Connection to BRM

The BRM real-time and batch rating engines now support SSL communication with the BRM Connection Manager (CM), improving the security among all BRM components.

For information, see "Enabling SSL/TLS in Real-Time Pipeline" in *BRM System Administrator's Guide*.

## Support for Full-Day Discounts

Previously, when rounding to midnight was disabled, and a discount was purchased after midnight, the discount would not be applied to the entire day. For example, a discount purchased at 15:00 on June 1 would apply only from 15:00 through 24:00 on June 1. Now, you can specify to apply the discount to the entire day even when rounding to midnight is disabled. That is, a discount purchased at 15:00 would apply from 00:00 through 24:00 on June 1.

You can use the new option with the **loadpricelist** utility. When creating discounts in your XML file, you set the value for the **<discount\_validity\_rounding>** element under the **<discount>** element. You can set **<discount\_validity\_rounding>** to one of the following:

- **ON**: Sets the discount start time to the time of purchase.
- **OFF**: Sets the discount start time to midnight (00:00:00) of the day the discount is purchased.
- **NOT\_SET**: Uses the systemwide setting in the **/config/business\_profile** object. This is the default.

For information, see "Setting Discount Validity Rounding" in *BRM Setting Up Pipeline Pricing*.

## Improved Timeout Consistency

Previously, timeouts in BRM terminated only the client side of the operation. The database operation was rolled back only after the transaction was completed.

BRM client applications contain a new parameter for setting the maximum timeout of BRM transactions. If a timeout occurs, the client side of the operation is terminated, and the transaction is not committed to the database. This guarantees that transactions are not committed when timeouts occur and writes to the database do not occur at any point during the transaction.

For information, see "Setting a Timeout Value for Requests Sent to the CM" in *BRM System Administrator's Guide*.

## Improved Synchronization Between BRM and External CRM Applications

Previously, BRM used the Synchronization Queue Data Manager to synchronize pricing data, such as charge offers, discount offers, and chargeshare offers, with external customer relationship management (CRM) applications. In the 15.0 release, Synchronization Queue Data Manager has been obsoleted.

To improve performance, BRM now uses the Oracle Data Manager (DM) to synchronize data between BRM and your external CRM. Oracle DM sends pricing data in business events to Oracle Advanced Queuing (AQ) database queues in the BRM database, where your external CRM can retrieve it. For information, see "Synchronizing Pricing Data between the BRM Database and External CRMs" in *BRM System Administrator's Guide*.

### Note:

Oracle DM rolls back the transaction in both the BRM database and the AQ database queue if the commit to either fails.

The BRM 15.0 installation includes scripts and configuration files to help you create and configure the AQ database queues.

## BRM CM Now Supports Authorization

Previously, BRM thick client applications, such as Customer Center and Pricing Center, handled all authorization with BRM. In addition, command-line utilities could not manage fine-grained authorization because they are part of the BRM server and have access to all opcodes and storable classes.

To improve security, the CM layer now also performs authorization. Authorization in the CM is based on opcodes the user is allowed to run and storable classes the user is allowed to read or update. The list of opcodes and storable classes users can access are defined in roles.

For more information, see "Managing Login Names and Passwords" in *BRM System Administrator's Guide*.

## Improved POID Caching

BRM 15.0 includes a new POID generation logic that limits the number of times data needs to be retrieved from the database, which improves performance.

## Simplified BRM Multischema Installation

In BRM 15.0, the multischema installation process has been simplified, reducing the overall time to set up your system.

Previously, the process for creating the database schemas was a two-step process. First, it made the primary and secondary schemas with all tables and snapshots. Second, it dropped the tables and snapshots from the secondary schemas and replaced them with views.

Now, the BRM multischema installation creates the database schemas in one step. It creates the primary schema with all tables and snapshots and the secondary schemas with views.

See "Installing a Multischema System" in *BRM Installation Guide* for more information.

## BRM Supports Validation for Dynamic Charging

Previously, you could dynamically override pricing at purchase time with no validation. Now, the overrides you can use at purchase time are restricted and validated by price tags created as setup components.

You configure price tags as setup components in PDC and publish them to BRM in changesets. The price tags are stored in the **/config/price\_tags** object.

The rules configured in the setup components determine which price tags are valid for a resource and which values can be used at purchase time. You can restrict price tags to certain resources, resource units, and services. You can restrict the values that can be used to a list or range of values.

For example, you could create the following price tag setup components:

- Applicable to the minute unit of free minutes resources of TelcoGSM and Telephony services, with permitted values of 10 and 20.
- Applicable to any unit of US Dollar resources of TelcoGSM services, with permitted values between 100 and 200.

- Applicable to the byte unit Euro resources of TelcoGSM services, with no restrictions on the value.

At purchase time, you retrieve the list of price tags and valid values for a specified resource, service, or product using the `PCM_OP_SUBSCRIPTION_GET_PRICE_TAGS` opcode. The opcode output includes the valid values you can use to override the price.

You can also see the details for price tags configured for products using the `PCM_OP_PRICE_GET_PRODUCT_INFO` opcode or the **Get Offer Details** endpoint of the Billing Care REST API.

For information, see "Configuring Dynamic Charging" in *PDC Creating Product Offerings*.

## Conversion Manager Supports All New Functionality

Conversion Manager supports all features added between the BRM 12.0 and BRM 15.0 releases, such as loan management and taxation exemptions.

# 6

## New Features in ECE

Learn about the new features in Oracle Communications Elastic Charging Engine (ECE).

Topics in this document:

- [New Features in ECE 15.1](#)
- [New Features in ECE 15.0.1](#)
- [New Features in ECE 15.0.0](#)

### New Features in ECE 15.1

ECE 15.1 includes the following enhancements:

- [Cleaning Up Stale Sessions Now Supported on NoSQL Databases](#)
- [HTTP Gateway Now Supports SSL Connections with NRF, PCF, and SMF](#)
- [Diameter Gateway Now Supports Dual-Stack IPv4 and IPv6](#)
- [BRM to ECE Synchronization Now Supports Currency Balances](#)
- [ECE Now Supports Cleaning Sy Sessions from the Cache](#)
- [ECE Now Logs Conflict Resolution Errors](#)
- [External Module Gateways Now Support Degraded Mode](#)
- [ECE Can Now Terminate Requests that Time Out in the Client](#)
- [Applying Fixed Charge for Zero Usage Now Supported](#)
- [ECE HTTP Gateway Now Supports OAuth 2.0 Authentication](#)
- [ECE Performance Enhancement Metrics](#)
- [Kafka Producer and Consumer Metrics Now Supported](#)
- [HTTP Gateway Now Supports 3GPP R17 for 5G](#)
- [RADIUS Gateway Now Supports Disconnect Requests](#)
- [RADIUS Gateway Now Supports Retrieving Subscriber Profile Information](#)
- [HTTP Gateway Now Supports Site-Specific SCP Configuration](#)
- [Automatically Renewing Granted Allowances Now Supported](#)

### Cleaning Up Stale Sessions Now Supported on NoSQL Databases

CDR Gateway now supports the following functionality on ECE systems using an Oracle NoSQL database. In previous releases, this functionality was supported only on persistence-enabled ECE deployments.

- [Closing open CDR sessions when a termination request does not arrive within a configurable duration.](#)



- Adding a custom reason value to a CDR's **causeForRecordClosing** field that specifies why a CDR session was closed.

You configure this functionality by using the **enableIncompleteCdrDetection**, **enableStaleSessionCleanupCustomField**, and **staleSessionCauseForRecordClosingString** fields in the *ECE\_home/config/management/charging-settings.xml* file. For more information, see "Setting Up ECE to Generate CDRs" in *ECE Implementing Charging*.

## HTTP Gateway Now Supports SSL Connections with NRF, PCF, and SMF

The HTTP Gateway (CHF) now supports SSL encryption between it and the NRF, PCF, and SMF network functions. You can enable this secure communication during the ECE deployment process or afterward.

For more information, see "Securing Communication Between the CHF and NRF, PCF, and SMF" in *BRM Cloud Native System Administrator's Guide*

## Diameter Gateway Now Supports Dual-Stack IPv4 and IPv6

Diameter Gateway has been enhanced to support dual-stack IPv4 and IPv6 in CCR requests.

For more information, see *ECE Diameter Gateway Protocol Implementation Conformance Statement*.

## BRM to ECE Synchronization Now Supports Currency Balances

BRM now synchronizes the currency balances for both parent and child accounts with ECE during wholesale billing that occurs at the end of a billing cycle.

For information, see "About Wholesale Billing" in *BRM Configuring and Running Billing*.

## ECE Now Supports Cleaning Sy Sessions from the Cache

ECE now supports the cleaning of stale Sy sessions from the **DiameterPersistenceSySession** cache. When this functionality is enabled, ECE automatically removes stale Sy sessions each time it receives a request from the Diameter client to initiate a Spending Limit Request (SLR).

For more information, see "Cleaning Sy Sessions from the Cache" in the *ECE Implementing Charging*.

## ECE Now Logs Conflict Resolution Errors

In active-active disaster recovery systems, any changes to the ECE cache on one site are automatically federated to the ECE cache on other sites. This federation process can lead to situations where concurrent updates to the same data in different sites results in conflicts. For example, Site 1 processes Joe's purchase of 500 prepaid minutes, and, at the same time, Site 2 processes Joe's usage of 20 prepaid minutes. ECE uses custom conflict resolution logic to merge these changes at both sites.

However, ECE may occasionally be unable to resolve these conflicts. When this happens, ECE now:

- Logs details about unresolved conflicts to the ECS log files, which are located in the *ECE\_home/logs* directory.

- Tracks information about conflict resolutions in a new ECE metric. [Table 6-1](#) outlines the metric introduced in the 15.1 release.

**Table 6-1 New Coherence Federated Service Metric**

Metric Name	Type	Description
ece.federated.service.change.records	Counter	Tracks the number of change records and tags them by conflict classification type: <ul style="list-style-type: none"><li>– notModified</li><li>– error</li><li>– alreadyConflictResolved</li><li>– internallyModified</li><li>– externallyModified</li><li>– sameBinary</li><li>– sameRevisionNumber</li><li>– deleted</li><li>– conflictDetected</li></ul>

For more information, see "About Conflict Resolution During the Federation Process" in *BRM System Administrator's Guide*.

## External Module Gateways Now Support Degraded Mode

External Module (EM) Gateways now verify whether an Elastic Charging Server (ECS) cluster is healthy before forwarding requests to it. When the number of healthy nodes in an ECS cluster falls below the minimum configured threshold, the EM Gateway returns an error to the BRM server and stops forwarding requests to the ECS cluster.

For more information, see "Supporting External Module Gateways in Degraded Mode" in *BRM System Administrator's Guide*.

## ECE Can Now Terminate Requests that Time Out in the Client

Client applications can contain their own request timeouts that activate when ECE takes too long to respond. When this occurs, the client application abandons the request, but ECE may continue to process the request and send a response, which the client discards. This extra processing is unnecessary and can be detrimental to ECE production systems approaching overload conditions. To improve performance, you can now configure the HTTP Gateway and Diameter Gateway to terminate requests that have timed out on the client side.

For more information, see "Checking for Client-Side Timeouts in HTTP Gateway" and "Checking for Client-Side Timeouts in Diameter Gateway" in *ECE Implementing Charging*.

## Applying Fixed Charge for Zero Usage Now Supported

You can now customize ECE to apply a fixed charge even if the associated usage charge is zero, when a subscription's charge offer contains both a fixed charge and a usage charge. By default, ECE does not apply any charges if the usage charge is zero.

For more information, see "Customizing ECE to Apply Fixed Charge for Zero Usage" in *ECE Implementing Charging*.

## ECE HTTP Gateway Now Supports OAuth 2.0 Authentication

The HTTP Gateway (CHF) now supports OAuth 2.0 authentication for 5G services. If this feature is enabled, the HTTP Gateway now only serves incoming requests from the network functions after validating the authentication of these requests. This applies to only 5G standalone REST APIs.

For more information, see "ECE REST API Security" in *BRM Security Guide* and [REST API for Elastic Charging Engine](#).

## ECE Performance Enhancement Metrics

New ECE Metrics along with updates to the existing metrics have been made. For more information, see "ECE Metrics" in *BRM System Administrators Guide* and "ECE Cloud Native Metrics" in *BRM Cloud Native System Administrators Guide*.

## Kafka Producer and Consumer Metrics Now Supported

ECE now allows you to monitor Apache Kafka producer and consumer metrics.

For more information, see the following in *BRM System Administrators Guide*:

- About Monitoring Kafka Servers
- Kafka Client Metrics

## HTTP Gateway Now Supports 3GPP R17 for 5G

HTTP Gateway (CHF) now supports 3GPP R17 for 5G services, alongside R16. This applies to 5G standalone (CHF) APIs only.

For more information, see [REST API for Elastic Charging Engine](#).

## RADIUS Gateway Now Supports Disconnect Requests

RADIUS Gateway can now manage disconnect request messages, which are sent to immediately end a customer's usage session that is in progress.

For more information, see the following:

- "About RADIUS Gateway Disconnection" in *ECE Implementing Charging*
- "Configuring ECE and RADIUS Gateway to Manage Disconnect Requests" in *ECE Implementing Charging*

## RADIUS Gateway Now Supports Retrieving Subscriber Profile Information

You can now customize the RADIUS Gateway to retrieve subscriber profile information, including customer and balance data, enabling its use for decision-making during the authentication process.

For more information, see "About RADIUS Gateway Authentication" in *ECE Implementing Charging*.

## HTTP Gateway Now Supports Site-Specific SCP Configuration

You can now configure primary and secondary SCP authorities for each HTTP Gateway instance in your system. This enables your system to send 5G traffic notifications for each HTTP Gateway instance.

For more information, see "Configuring Communication Through SCP" in *ECE Implementing Charging*.

## Automatically Renewing Granted Allowances Now Supported

You can now configure ECE to automatically renew granted allowances once the resources of the previous grant have been depleted. For example, you can automatically renew 5 free minutes after each consumption of 10 MB data. This enables continuous access to the granted resource without requiring manual renewal.

For more information, see "About Automatically Renewing Granted Allowances" in *ECE Implementing Charging*.

## New Features in ECE 15.0.1

ECE 15.0.1 includes the following enhancements:

- [ECE Uses Non-Linear Rating by Default](#)
- [Configuring External Modules for High Availability](#)
- [Setting the Order to Consume Allowances](#)
- [Active-Active Sy Session Re-Anchoring](#)
- [Creating Midsession-Rated Events for Product Changes](#)
- [Enhanced Rated Event Formatter Resiliency](#)

## ECE Uses Non-Linear Rating by Default

ECE now uses non-linear rating for all usage rating, but you can configure ECE to use linear rating for specified products or product-and-event combinations. In previous releases, the default was linear rating.

For information, see "About Linear and Non-Linear Rating" in *ECE Implementing Charging*.

## Configuring External Modules for High Availability

The External Manager (EM) Gateway now supports the same load-balanced and active-passive failure modes previously only available for Data Managers (DMs).

In the CM **pin.conf**, you can now define a single **em\_pointer** entry with multiple host and port pairs that will be tried in order when attempting to establish a connection (permitting active-passive semantics). This is in addition to the previous configuration with multiple **em\_pointer** entries which allowed only load-balanced connection attempts (permitting active-active semantics).

Note that only one type of configuration may be used for a given EM, but different EM components may use either configuration type. For example, connections to ECE's EM

Gateway might use active-passive logic, while connections to the Pipeline Manager might use active-active logic.

In a cloud native environment, you configure a service and port pair, where a Kubernetes service acts as a logical target for multiple components. In this model, you can connect to a preferred Kubernetes service (on, say, site 1), which would load-balance across several EMs configured on site 1. In this model, you can connect to a preferred Kubernetes service (on say, site 1) and that would load-balance across a number of EMs configured on site 1.

So, for cloud native, you can, in effect, mix HA and load-balanced configurations (although they are always configured as HA or load-balanced in the CM).

For more information on EM Gateway, see "Configuring ECE for High Availability" in *BRM System Administrator's Guide*.

## Setting the Order to Consume Allowances

You can now configure the order in which ECE consumes allowances from offers with the same priority. To do so, use the new **offerSelectionModeOnEquiPriorityOffers** entry in your **charging-settings.xml** file, **values.yaml** file, or ECE configuration MBeans. You can specify whether to consume allowances from offers based on the earliest validity start date or the earliest validity end date.

For information, see "Configuring the Consumption Order for Offers with the Same Priority" in *ECE Implementing Charging*.

## Active-Active Sy Session Re-Anchoring

In active-active disaster recovery systems, a prolonged Diameter Gateway outage on one site may cause Sy sessions to not re-anchor to the next available Diameter Gateway. This occurs because PCRF does not send update requests back to the available Diameter Gateway in the same deployment site or in another deployment site.

To fix this, ECE contains new JMX commands that instruct Diameter Gateway to:

- Start consuming from a specified partition ID
- Stop consuming from a specified partition ID

When one or more Diameter Gateway instances fail, you can use the JMX command to enable the active Diameter Gateway instance to start consuming from specific Kafka partitions for the failed Diameter Gateway instance.

For more information, see "Active-Active Sy/Gy Session Re-Anchoring" in *BRM System Administrator's Guide*.

## Creating Midsession-Rated Events for Product Changes

You can now configure ECE to generate midsession-rated events when rating moves from one product to another for the consumption of resources. For example, assume a session consists of the following:

- Total Used Service Units (USU): 800 MB
- First 220 MB is rated using Product 1
- Next 500 MB is rated using Product 2
- Remaining 80 MB is rated using Product 3

In this case, ECE would generate the two midsession-rated events:

- CDR 1 for 220 MB
- CDR 2 for 500 MB

The remaining 80 MB being rated using Product 3 stays in the active session.

**Note:**

This feature does not work if the product has a rate plan with multiple tiers.

For more information, see "Generating Midsession-Rated Events for Charge Offer Changes" in *ECE Implementing Charging*.

## Enhanced Rated Event Formatter Resiliency

Rated Event (RE) Formatter has been enhanced to continue processing events when temporary database connectivity issues occur.

Sometimes, database issues can cause database writes to fail while database reads succeed. This causes rated events to remain in the Coherence cache and not persist in the database. After the database issue is resolved, rated events in the cache are written to the database. However, the RE Formatter checkpoint for formatting rated events has already advanced, causing the rated events to be lost. This causes a data resiliency issue.

To fix this, RE Formatter now monitors the rated event persistence activity by ECS nodes. If persistence stops, RE Formatter pauses the checkpoint. Checkpoint advancing restarts only after:

- The database write issue is resolved
- The persistence backlog by the ECS nodes is cleared

## New Features in ECE 15.0.0

This section lists the features introduced between ECE 12.0 Patch Set 8 and ECE 15.0.0.

For information about the features introduced between ECE 12.0 and ECE 12.0 Patch Set 8, see "[New Features in ECE](#)" in *BRM 12.0 Patch Set Release Notes*.

ECE 15.0.0 includes the following enhancements:

- [HTTP Gateway Now Supports Primary and Secondary NRFs](#)
- [Specifying to Consume Main Balance Before Loan Balance](#)
- [ECE Charging Refund Enhancements](#)
- [Rollover Information Now Synchronized with ECE](#)
- [Extension for Customizing Notification Payloads](#)
- [Extension for Unrated Quantity Information](#)
- [Extension for Custom Reason Codes](#)
- [Extension for Generating RARs for Sharing Group Members](#)
- [Extension for Retrieving Worst Cost Setting](#)

- Diameter Gateway Balance Query Response Enhancement
- CDR Generator Can Mark CDRs as Incomplete
- CDR Generator Can Detect Duplicate CDRs and Stale Sessions
- Dynamic Quota Not Granted When No RSU in Request
- ECE Supports Immediately Consuming Debit Discounts
- Publish Notifications to Separate Kafka Topic
- ECE Now Supports Kafka JMX Metrics
- ECE Now Supports SSL Connections with Kafka Servers
- Improved Synchronization Between BRM and ECE
- `ece_brs_current_latency_by_type_seconds` Metric Generates Latency Data Per Service

## HTTP Gateway Now Supports Primary and Secondary NRFs

You can now configure primary and secondary Network Repository Function (NRF) registration servers in HTTP Gateway. When a heartbeat to the primary NRF server fails, HTTP Gateway retries the heartbeat for a configurable number of times. If all retries fail, HTTP Gateway initiates a registration request on the secondary NRF server.

You configure one or more primary NRF servers using the existing **`nrfRestEndPointUrl`** MBean attribute, and you configure one or more secondary NRF servers using the new **`nrfSecondarySiteRestEndPointUrls`** MBean attribute.

To configure primary and secondary NRF registration servers:

1. Access the ECE configuration MBeans in a JMX editor, such as JConsole. See "Accessing ECE Configuration MBeans" in *ECE Implementing Charging*.
2. Expand the **ECE Configuration** node.
3. Expand **charging.nfProfileConfigurations**.
4. Expand **Attributes**.
5. Specify the value for the following attributes:
  - **`nrfRestEndPointUrl`**: Set this to the endpoint URL of one or more primary NRF servers. To configure multiple primary NRF servers, list the endpoint URLs, in order, separated by a comma (,).
  - **`nrfSecondarySiteRestEndPointUrls`**: Set this to the endpoint URL of one or more secondary NRF servers. To configure multiple secondary NRF servers for a primary, list the endpoint URLs, in order, separated by a semicolon (;). If you have multiple primary NRF servers and want to map each to a different secondary NRF server, separate the endpoint URLs by a comma (,).

For example, the following specifies that the **`primaryNRF_1`** NRF server has two secondary NRF servers (**`secondary_NRF_1`** and **`secondary_NRF_2`**). The **`primaryNRF_2`** NRF server has only one secondary NRF server (**`secondary_NRF_3`**):

```
nrfRestEndPointUrl="www.primaryNRF_1.com,www.primaryNRF_2.com"
secondaryNrfEndpointUrl="www.secondary_NRF_1.com;www.secondary_NRF_2.com,www.seco
ndary_NRF_3.com"
```

For information, see "Configuring Multiple Primary and Secondary NRF Registration Servers" in *ECE Implementing Charging*.



## Specifying to Consume Main Balance Before Loan Balance

By default, ECE consumes a customer's loan balance before consuming the customer's principal balance. You can now configure at the service level to consume the principal balance before consuming the loan balance. You might do this, for example, to prevent fraud by customers using their loan balance and leaving before paying it back.

For information, see "Customizing Consumption Order of Loan and Principal Balances" in *ECE Implementing Charging*.

## ECE Charging Refund Enhancements

By default, ECE temporarily stores information about direct debit requests in its cache to validate any refunds against one of the requests. However, some event types may not be eligible for refunds, so storing the direct debit request information in the cache is unnecessary. You can now configure ECE not to store direct debit requests in its cache for specific event types.

To prevent ECE from storing direct debit request information in its cache for specific event types:

1. Access the ECE configuration MBeans in a JMX editor, such as JConsole. See "Accessing ECE Configuration MBeans" in *ECE Implementing Charging*.
2. Expand the **ECE Configuration** node.
3. Expand **charging.server**.
4. Expand **Attributes**.
5. In the **excludedEventsForDebitRefundSessions** attribute, list the event types separated by commas.

For information, see "Managing Direct Debit Data in ECE Cache" in *ECE Implementing Charging*.

## Rollover Information Now Synchronized with ECE

Rollover data is now included in the balance data synchronized from BRM to ECE. This allows ECE to include the rollover data in:

- In-session notifications sent to your customers
- Responses to balance queries sent from the ECE Java API

For information, see "About Balance Query Requests" in *ECE Implementing Charging*.

## Extension for Customizing Notification Payloads

ECE now includes extensions for customizing the data contained in notification payloads. For example, add the subscriber ID and event time stamp to all notification payloads.

For information, see "Post-Update Extension - Enriching External Notifications" in *ECE Implementing Charging*.



## Extension for Unrated Quantity Information

ECE now includes extensions for writing any unrated quantity that occurs during offline charging to a CDR or notifications payload.

For information, see "Configuring ECE to Support Prepaid Usage Overage" in *ECE Implementing Charging*.

## Extension for Custom Reason Codes

When ECE generates a midsession-rated event, it automatically records why the event was split in the event's **midSessionCDRSplitReason** field. ECE sets the field to one of the preconfigured reason codes in [Table 6-2](#).

**Table 6-2 Midsession Rated Event Reason Codes**

Reason Code	Description	Value
CONFIGURED_VOLUME_REACHED	The event exceeded a configured volume, such as 100 MB.	1
CONFIGURED_DURATION_REACHED	The event exceeded a configured amount of time, such as 2 hours.	2
RATING_CONDITION_CHANGE	The trigger was caused by a change in tariffs.	3
CONFIGURED_TIME_OF_THE_DAY_CROSSED	The event crossed a configured time of day, such as midnight.	4
INTERNAL_TRIGGER	The trigger was caused by a context change.	5
EXTERNAL_TRIGGER	The midsession trigger condition was met.	6
MULTIPLE_USU	The event contained multiple Used Service Units (USUs). ECE generates a midsession-rated event for each USU.	7
MULTIPLE_USU_AND_EXTERNAL_TRIGGER_OR_INTERNAL_TRIGGER	The event was caused by any of the preceding triggers.	8
PRE_MIDSESSION_CONDITION	The event reached a custom trigger at the prerating extension point.	9
POST_MIDSESSION_CONDITION	The event reached a custom trigger at the post-rating extension point.	10
ZONE_CHANGE	The trigger was caused by a change in zone. <b>Note:</b> This reason code is new in BRM 15.0.	11
BALANCE_EXHAUST	The event was triggered after the complete exhaustion of an existing balance. <b>Note:</b> This reason code is new in BRM 15.0.	12

You can now extend ECE to add these preconfigured reason codes to midsession-rated events generated by custom criteria. To do so, you extend ECE at the pre-rating and post-rating extension points. For more information, see these ECE SDK sample programs:

**SamplePostRatingMidSessionExtension** and **SamplePreRatingMidSessionExtension**.

For information, see "Viewing Reason for Midsession-Rated Event" in *ECE Implementing Charging*.

## Extension for Generating RARs for Sharing Group Members

When changes in charging occur during an active session, ECE sends a reauthorization request (RAR) to the network. By default, ECE sends an RAR for all active sessions initiated by that subscriber.

You can now extend ECE to send RARs for all active sessions using a sharing group balance. For example, assume a sharing group includes accounts A, B, C, and D, and accounts A and C currently have active sessions using the sharing group balance. If an RAR is triggered for account C, ECE sends RARs for account A's and C's active sessions.

For more information about extending ECE to support RARs for sharing group members, see these ECE SDK sample programs: **SampleRarPostChargingExtension**, **SampleRarPostRatingExtension**, and **SampleRarPreRatingExtension**.

For information, see "Customizing Server-Initiated Reauthorization for Sharing Groups" in *ECE Implementing Charging*.

## Extension for Retrieving Worst Cost Setting

You can now extend ECE to retrieve the value of the **isAdjustedForWorstCost** parameter, which specifies whether to reserve the worst possible cost during the authorization process. To do so, you extend ECE at the post-rating and post-charging extension points.

For information, see "Customizing Worst-Case Rating Reservation" in *ECE Implementing Charging*.

## Diameter Gateway Balance Query Response Enhancement

By default, Diameter Gateway includes information about the main balance in balance query responses. You can now configure Diameter Gateway to include both the main and loan balance information in balance query responses.

To configure it to do so, in the ECE Balance Java API, set the **balancequerymode** to **TURBO**. For more information about **balancequerymode**, see the documentation for **oracle.communication.brm.charging.messages.query** in [ECE Java API Reference](#).

## CDR Generator Can Mark CDRs as Incomplete

When CDR generation is enabled, each site in an active-active system contains a CDR Generator, and each site can generate unrated CDRs for external systems. When one of the active sites goes down, the CDR database retains all in-progress CDR sessions, and subsequent 5G usage requests are diverted to another active site, which generates CDRs for those in-progress CDR sessions.

To prevent downstream mediation systems from processing the in-progress CDR sessions, you can now configure CDR Generator to mark them as incomplete.

To enable CDR Generator to detect and mark CDRs as incomplete:

1. Access the ECE configuration MBeans in a JMX editor, such as JConsole. See "Accessing ECE Configuration MBeans" in *ECE Implementing Charging*.
2. Expand the **ECE Configuration** node.
3. Expand **cdrFormatters**.

4. Expand **Attributes**.
5. Set the **enableIncompleteCdrDetection** attribute to **true**. The default value is **false**.

For information, see "Generating CDRs for External Systems" in *ECE Implementing Charging*.

## CDR Generator Can Detect Duplicate CDRs and Stale Sessions

CDR Gateway can now detect and mark the following:

- CDR sessions that fail because a production site went down in an active-active disaster recovery system. When this feature is enabled, CDR Generator adds the **causeForRecordClosing** field to each CDR file, indicating why the CDR was released.
- Duplicate usage updates when a CDR is split across two sites in an active-active disaster recovery system. In this case, CDR Gateway adds a custom field to the record's extensions.

To enable duplicate CDR detection and stale session detection:

1. Access the ECE configuration MBeans in a JMX editor, such as JConsole. See "Accessing ECE Configuration MBeans" in *ECE Implementing Charging*.
2. Expand the **ECE Configuration** node.
3. Expand **charging.cdrGatewayConfigurations**.
4. Expand **Attributes**.
5. Set **retransmissionDuplicateDetectionEnabled** to **true**.
6. Under **ECE Configuration Node**, expand **cdrFormatterPlugins**.
7. Expand **Attributes**.
8. Specify values for the following fields:
  - **staleSessionCauseForRecordClosingString**: Set this to **PARTIAL\_RECORD**.
  - **enableStaleSessionCleanupCustomField**: Set this to **true**.

For information, see "Generating CDRs for External Systems" in *ECE Implementing Charging*.

## Dynamic Quota Not Granted When No RSU in Request

When a usage request is missing the requested service unit (RSU) AVP, ECE no longer returns the dynamic quota in the usage response to the network.

For information, see "Managing Dynamic Quotas for Online Sessions" in *ECE Implementing Charging*.

## ECE Supports Immediately Consuming Debit Discounts

ECE, like PDC, has added support for immediately deducting currency-based discounts from customer account balances.

## Publish Notifications to Separate Kafka Topic

By default, ECE publishes asynchronous notifications for external applications to the ECE Notification topic. You can now configure ECE to publish one or more asynchronous notifications to multiple partitions in a separate Kafka topic (called the ECE External Notification topic). ECE routes notifications using the customer ID as a partition key, meaning

each notification has a dedicated partition for a given customer. You can now configure ECE to publish all external notifications to one Kafka topic. In this case, the topic is named ECE.

For information, see "Publishing Asynchronous Notifications to a Separate Kafka Topic" in *ECE Implementing Charging*.

## ECE Now Supports Kafka JMX Metrics

ECE can now expose Kafka JMX standard metrics for monitoring notification messages. You can analyze and view these metrics using Prometheus and Grafana.

For information, see "Kafka JMX Metrics" in *BRM System Administrator's Guide*.

## ECE Now Supports SSL Connections with Kafka Servers

You can now create an SSL-enabled connection between ECE and the Kafka server. You enable SSL and specify the TrustStore location during the ECE installation process.

## Improved Synchronization Between BRM and ECE

When customer data is updated in the BRM database, the updates must be applied synchronously (in real-time) to ECE. For example, when a CSR adds, cancels, or modifies an account or when an adjustment such as a cycle fee is applied to an account balance, that information must be updated in ECE so that ECE can rate service usage events properly. Previously, BRM used the Account Synchronization Manager to synchronize data with ECE. In the 15.0 release, Account Synchronization Manager has been obsoleted.

To improve performance, BRM now uses the Oracle Data Manager (DM) to synchronize data between ECE and the BRM database. Oracle DM sends customer data in business events to Oracle Advanced Queuing (AQ) database queues in the BRM database. Then, the ECE Customer Updater retrieves the business events from the queues and updates the information in the ECE cache. For information, see "Synchronizing Account Data between BRM and ECE" in *BRM System Administrator's Guide*.



### Note:

Oracle DM rolls back the transaction in both the BRM database and the AQ database queue if the commit to either fails.

The BRM 15.0 installation includes scripts and configuration files to help you create and configure the AQ database queues.

## ece\_brs\_current\_latency\_by\_type\_seconds Metric Generates Latency Data Per Service

The **ece\_brs\_current\_latency\_by\_type\_seconds** metric now generates latency data per service type, such as by data, voice, and SMS. For information, see "BRS Metrics" in *BRM System Administrator's Guide*.

# 7

## New Features in PDC

Learn about the new features in Oracle Communications Pricing Design Center (PDC).

Topics in this document:

- [New Features in PDC 15.1](#)
- [New Features in PDC 15.0.1](#)
- [New Features in PDC 15.0.0](#)

### New Features in PDC 15.1

PDC 15.1 includes the following enhancements:

- [PDC Now Supports Automatic Renewal of Granted Allowances](#)

### PDC Now Supports Automatic Renewal of Granted Allowances

You can now configure granted allowances to automatically renew once the resources of the previous grant have been depleted. For more information, see "Auto Renewing Granted Allowances" in *PDC Online Help* and "Configuring the Auto Renewal of Allowances" in *PDC Creating Product Offerings*.

### New Features in PDC 15.0.1

PDC 15.0.1 includes the following enhancements:

- [Subscription Term Enhancements](#)
- [Triggering Either In-Advance or Post-Expiration Notifications](#)
- [New Mappings for PDC TMF 620 API](#)
- [Updated Examples in PDC TMF 620 REST API](#)

### Subscription Term Enhancements

PDC now supports the following subscription term enhancements:

- **Minimum Contract Length:** You can now specify a minimum length for a contract with corresponding penalty charges for early cancellation. If customers cancel early, they must pay the remaining balance up to the minimum contract length.

For example, assume a subscription term has a 1-year commitment period, a minimum contract length of 4 months, and a \$50 monthly fee. Customers would be charged \$50 for each month remaining in the 4-month minimum contract length. A customer canceling after 1 month would pay \$150, and a customer canceling after 3 months would pay \$50. A customer canceling after 6 months would pay \$0 because they already paid the 4-month minimum.

- **Penalty Fees:** The penalty fee can now consist of an early termination fee, the remaining contract balance, or both.

In previous releases, the penalty fee could be an early termination fee or the contract balance. You could not apply both.

For more information, see "About Penalty Fees" in *PDC Creating Product Offerings*.

To implement these enhancements, use the following:

- The PDC UI. See "Configuring Early Termination Fees" in *PDC Online Help*.
- The following XML tags in your **ImportExportPricing** input file: **minimumContractLength**, **minimumContractUnit**, and **penaltyOptions**. See the *PDC\_home/apps/Samples/Examples/Sample\_SubscriptionTerms.xml* file and "Subscription Terms" in *PDC Creating Product Offerings*.

## Triggering Either In-Advance or Post-Expiration Notifications

PDC now allows you to configure the following to generate notifications in advance, after expiration, or both. In previous releases, in-advance and post-expiration notifications were either both enabled or both disabled.

- **Balance elements:** You can configure any currency or noncurrency balance element to trigger notification events when its validity period is about to expire, when it has already expired without new funds being added, or for both.
- **Product expiration:** You can configure a subscription to trigger notification events before the subscription expires, after the subscription expires, or for both.
- **Subscription renewals:** You can configure a subscription to trigger notification events before it is due for renewal, after it is past due for renewal, or for both.

For information, see "Configuring BRM to Send Notifications to External Notification Applications" in *BRM Managing Customers*.

## New Mappings for PDC TMF 620 API

The [REST API Reference for Pricing Design Center TMF 620 API](#) supports new mappings for the following:

- GET, POST, and PATCH of product offering with extensions (proration settings, billing cycle settings, discount rules, triggers).
- GET, POST, and PATCH of attribute-based alterations (discount selector).
- PATCH of product offerings with selectors using service, event, and account attributes for subscription or usage events.
- Account-level charge and discount offers.

To view the new mappings, see "Mapping Product Offerings" in *PDC REST Services Manager Integration Guide*.

## Updated Examples in PDC TMF 620 REST API

The product offering price endpoints in [REST API Reference for Pricing Design Center TMF 620 API](#) includes additional examples using charge selectors.

## New Features in PDC 15.0.0

This section lists the features introduced between PDC 12.0 Patch Set 8 and PDC 15.0.0.

For information about the features introduced between PDC 12.0 and PDC 12.0 Patch Set 8, see "[New Features in PDC](#)" in *BRM 12.0 Patch Set Release Notes*.

PDC 15.0.0 includes the following enhancements:

- [Support for Purchasing Same Offer Multiple Times with Separate Balances](#)
- [PDC Supports Debiting in Discounts Consumed Immediately](#)
- [New TMF-Based REST API for PDC](#)
- [Support for Full-Day Discounts](#)
- [New PDC REST API](#)
- [Validation for Dynamic Charging](#)

### Support for Purchasing Same Offer Multiple Times with Separate Balances

Previously, customers could extend the validity of a balance by purchasing an offer again, and BRM added the new balance to the existing balance. Now, you can choose to track the new and existing balances separately, with separate validity dates.

You can choose from two new options:

- **Longest date:** Extends the old subscription with a separate balance, setting the validity end date to whichever is later, the new or existing validity.
- **Cumulative validity:** Extends the old subscription with a separate balance, setting the validity end date by adding the new validity to what remains of the old validity.

For example, on June 1, a customer purchases an add-on bundle that grants 3GB of data, is valid for seven days, and has a grace period of four days. On June 3, after using 1GB, they purchase the bundle again. With both options, the new 3GB balance is added to a new balance group, separate from the remaining 2GB in the old balance group.

With the longest date option, the new balance is valid starting on June 3, and BRM compares the validity periods of the old and new balances to set the validity end date for the new balance to the later of the two end dates, June 10. The old balance retains the original validity dates.

With the cumulative validity option, the new balance is valid starting on June 8. BRM adds the validity period of the old balance to the new balance to set the validity end date for the new balance to June 15. The old balance retains the original validity dates.

You can choose the new options using:

- The PDC UI. When customizing offers in bundles, select the new options from the **Behavior** menu in the Purchase area.
- The **ImportExportPricing** utility. When creating bundles in XML, set the value `<purchaseMode>` element under the `<bundledProductOfferingItem>` element to either **LONGEST\_DATE\_NEW\_SUB\_BAL** or **EXTEND\_NEW\_SUB\_BAL**.

For information, see "About Purchasing the Same Offer Multiple Times" in *PDC Creating Product Offerings*.

## PDC Supports Debiting in Discounts Consumed Immediately

You can now create currency-based discounts in PDC that are deducted from the customer's account balance immediately. To do so, you add the new **Instant Debit** balance impact type to your discount.



### Note:

The **Instant Debit** balance impact type is supported if all of the following are true:

- ECE is enabled in the system
- It is included in a standard discount or a standard chargesharing pricing profile for ECE charging
- It uses currency balance elements
- It is included in fixed or percentage discounts

For information, see "About Discount Offers and Discounts" in *PDC Creating Product Offerings*.

## New TMF-Based REST API for PDC

PDC contains a new TMF-based REST API, allowing you to manage a BRM system's product offerings. The PDC TMF REST API can perform the following operations:

- Retrieves one or more product offerings, product offering prices, or product specifications
- Updates product offerings, product offering prices, or product specifications
- Creates product offerings, product offering prices, or product specifications
- Deletes product offerings, product offering prices, or product specifications
- Manages event notifications

For information, see [REST API Reference for Pricing Design Center TMF 620 API](#).

## Support for Full-Day Discounts

Previously, when rounding to midnight was disabled, and a discount was purchased after midnight, the discount would not be applied to the entire day. For example, a discount purchased at 15:00 on June 1 would apply only from 15:00 through 24:00 on June 1. Now, you can specify to apply the discount to the entire day even when rounding to midnight is disabled. That is, a discount purchased at 15:00 would apply from 00:00 through 24:00 on June 1.

You can configure this option using the PDC UI or the **ImportExportPricing** utility.

When creating discounts in an XML file, you set the value in the **<validityRounding>** element under the **<alterationOffering>** element. You can set **<validityRounding>** to one of the following:

- **OFF**: Sets the discount start time to the time of purchase.
- **ON**: Sets the discount start time to midnight (00:00:00) of the day the discount is purchased.



- **NOT\_SET**: Uses the systemwide setting. This is the default.

For information, see "Configuring Discount Validity Rounding" in *PDC Creating Product Offerings*.

## New PDC REST API

PDC contains a new REST API that allows you to do the following:

- Manage pricing components in your BRM system. For example, you can create, modify, and delete charge offers, discount offers, and selectors.
- Manage setup components in your BRM system. For example, you can create, modify, and delete setup components that PDC manages, such as balance elements, custom rules, deliverables, and tax codes.

For information, see [REST API Reference for Pricing Design Center](#).

## Validation for Dynamic Charging

Previously, you could dynamically override pricing at purchase time with no validation. Now, you create price tags as setup components with validation rules to determine valid overrides for charge offers and discount offers at purchase time.

You configure price tags as setup components, add them to balance impacts when creating charge offers and discount offers, and set their values at purchase time.

You use the **ImportExportPricing** utility or the PDC UI to create the price tag setup components and add them to balance impacts. The rules configured in the setup components determine which price tags are valid for a given balance impact and which values can be used at purchase time. You can restrict price tags to certain balance elements, resource units, and services. You can restrict the values that can be used to a list or range of values.

For example, you could create the following price tag setup components:

- Applicable to the minute unit of free minutes resources of TelcoGSM and Telephony services, and the only permitted values are 10 and 20.
- Applicable to any unit of US Dollars resources of TelcoGSM services, and permitted values are between 100 and 200.
- Applicable to the byte unit Euro resources of TelcoGSM services, with no restrictions on the value.

You cannot use price tags with charge shares or temporary balance elements in discount offers.

For information, see "Configuring Price Tags" in *PDC Creating Product Offerings*.

# 8

## New Features in Billing Care

Learn about the new features in Oracle Communications Billing Care.

Topics in this document:

- [New Features in Billing Care 15.1](#)
- [New Features in Billing Care 15.0.1](#)
- [Enhancements in Billing Care 15.0.0](#)

### New Features in Billing Care 15.1

Billing Care 15.1 includes the following enhancements:

- [Noncurrency Adjustment Enhancements](#)
- [Noncurrency Resource Enhancements](#)
- [Wholesale Parent Accounts Can Now Contain Multiple Bill Units](#)
- [Billing Care Now Allows Viewing Payment Details for a Deposit](#)
- [Enhancement to Charge Sharing Groups and Discount Sharing Groups](#)
- [Billing Care SDK Batch Customization Enhancements](#)
- [Account Searches Can Now Include Service ID](#)
- [Billing Care REST API Enhancements](#)

#### Noncurrency Adjustment Enhancements

Billing Care now allows you to make adjustments to noncurrency resources without creating a new sub-balance. See "Adjusting an Existing Sub-Balance" in *Billing Care Online Help*.

In previous releases, it only allowed you to create a new noncurrency adjustment. Billing Care then checked whether the adjustment could be added to any existing sub-balance based on the validity period and grantor option. If not, a new sub-balance was created.

#### Noncurrency Resource Enhancements

Billing Care now supports filtering the items in the balance bucket, changing the validity period for an existing noncurrency sub-balance, and modifying the credit control properties for the sub-balances.

For more information, see "Adjusting a Noncurrency Resource" in *Billing Care Online Help*.

#### Wholesale Parent Accounts Can Now Contain Multiple Bill Units

Billing Care now supports multiple bill units in a wholesale parent account. The account must contain the following:

- A default wholesale bill unit into which the charges of all child bill units are rolled up.

- One or more normal bill units for collecting charges that the parent makes. You can generate bills and invoices for each of these normal bill units independent of wholesale billing.

For more information, see "Configuring Wholesale Billing" in *BRM Configuring and Running Billing*.

In previous releases, Billing Care supported only one bill unit in a wholesale billing parent into which all parent and child charges were rolled up.

## Billing Care Now Allows Viewing Payment Details for a Deposit

You can now use Billing Care to view details related to a payment made for a deposit. For more information, see "Viewing Payment Details of a Deposit" in *Billing Care Online Help*.

## Enhancement to Charge Sharing Groups and Discount Sharing Groups

Billing Care has a new flag that defers the roll up of balances from sharing group members to a sharing group owner. This enhancement optimizes the roll up performance of charges to sharing group owners for large sharing groups.

In previous releases, charges from sharing group members were rolled up immediately to the sharing group owner. Thus, if an owner had multiple sharing group members, processing all charges at once caused performance issues.

In addition, you can now view the membership list, search for members, and manage individual service memberships for accounts in a charge sharing group or discount sharing group.

For more information, see "Sharing Groups" in *Billing Care Online Help*.

## Billing Care SDK Batch Customization Enhancements

The Billing Care SDK now supports the following customizations of the batch payment and batch template windows:

- **Custom columns:** Add custom columns to the Batch Creation and Batch Template windows, allowing for inclusion of additional data relevant to your business needs.
- **Enhanced search:** Implement a drop-down list for payment search, providing a more efficient way to locate specific payments.
- **Configurable drop-down lists:** Implement custom drop-down lists within batches and batch templates, enabling predefined options for specific fields. You can replace standard text boxes with drop-down lists for specific columns.

For more information, see *Billing Care SDK Guide*.

## Account Searches Can Now Include Service ID

Billing Care now allows you to search accounts based on the service ID when a service has multiple aliases for a service. An enhancement has been made to display or search alias list values other than at the 0th index.

## Billing Care REST API Enhancements

The following Billing Care REST API endpoints have been added in the 15.1 release:

- `PUT /bcws/webresources/v1.0/sharing/group/{id}/members` (Add or Delete Services for Members)
- `GET /bcws/webresources/v1.0/sharing/{id}/members/types` (Get Sharing Group Member Types)
- `GET /bcws/webresources/v1.0/sharing/{id}/members` (Get Sharing Group Member Details)

For more information, see [REST API Reference for Billing Care](#).

## New Features in Billing Care 15.0.1

Billing Care 15.0.1 includes the following enhancements:

- [Billing Care Now Supports Contracts for All Revenue Recognition Types](#)
- [Authorization for Billing Care Contracts View](#)
- [Authorization for Billing Care Batch Payment Process and Batch Template Views](#)
- [Itemized Tax Calculation for Disputes and Settlements](#)
- [Standardized Date and Time Formats](#)
- [Enhancements for Batch Payments, Refunds, and Reversals](#)
- [Tracking CSR Activity for Audit Purposes](#)

## Billing Care Now Supports Contracts for All Revenue Recognition Types

Billing Care now supports contracts when deliverable-based recognition is disabled. A contract is a subscription with terms your customers agree to when purchasing it. The terms define the commitment period and options for canceling and renewing the subscription. See "Managing Customer Contracts" in *BRM Managing Customers* for more information.

In previous releases, Billing Care supported contracts only when deliverable-based revenue recognition was enabled.

To support contracts, Billing Care includes the following enhancements:

- The Account Creation wizard now displays the **Terms** stop, regardless of whether deliverable-based revenue recognition is enabled.

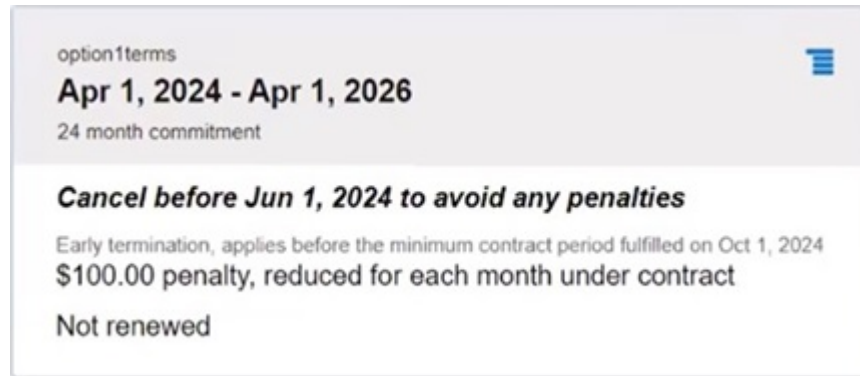
### **Note:**

The Account Creation wizard grays out the **Terms** stop and skips the **Terms** page when a package does not contain terms.

- The **Subscriptions** area on the **Bills** tab has been obsoleted. To view all subscriptions, packages, and contracts a customer owns, you now click the **Assets** area on the **Bills** tab.
- The new Filtered Services dialog box allows you to filter services-focused asset cards by service type, service status, or service ID.
- On the **Assets** page in the **Services** and **Offers** view, assets cards now display a **View Contract** button when a package contains terms.
- The **Assets** page includes a new **Contracts** view, which allows you to view details about the contract's terms, such as the commitment period, the grace period, the penalty for

canceling early, and the auto-renewal options. [Figure 8-1](#) shows a sample asset card in the **Contracts** view.

**Figure 8-1 Example Asset Card in Contracts View**



For more information, see the following in *Billing Care Online Help*:

- Assets
- Purchase

You can also customize the information displayed on the contract term's asset card.

There are also two new endpoints in the Billing Care REST API to support this feature:

- GET `/bcws/webresources/v1.0/subscriptions/account/{id}/purchasedcontracts` (**Get Purchased Contracts for an Account**)
- GET `/bcws/webresources/v1.0/subscriptions/contracts/{id}/services` (**Get Services for a Contract**)

For more information about these endpoints, see *REST API Reference for Billing Care*.

## Authorization for Billing Care Contracts View

Billing Care supports authorization for the new Billing Care Contracts view. The authorization Subscription resource includes the following new actions:

- **ContractRenew:** Allows the user to enable or disable a contract's auto-renewal options in Billing Care or through the Billing Care REST API.
- **ContractTerminate:** Allows the user to cancel a customer's contract in Billing Care or through the Billing Care REST API.

When a user does not have these resource grants:

- The Billing Care UI hides the auto-renewal and termination actions on all contract asset cards.
- The Billing Care REST API generates these error messages when users attempt to perform the auto-renewal or termination actions:
  - You do not have permission to enable or disable auto-renew facility for contracts.
  - You do not have permission to terminate a contract.

For more information, see "About Billing Care Authorization Resources" in *BRM Security Guide*.

## Authorization for Billing Care Batch Payment Process and Batch Template Views

Billing Care supports authorization for the new Billing Care Batch Payment Process and Batch Template views. The authorization Payment resource includes the following new actions:

- **BatchTemplateCreate:** Allows the user to create batch templates in Billing Care or through the Billing Care REST API.
- **BatchTemplateDelete:** Allows the user to delete batch templates in Billing Care or through the Billing Care REST API.
- **BatchTemplateModify:** Allows the user to modify batch templates in Billing Care or through the Billing Care REST API.
- **BatchProcess:** Allows the user to validate and submit batch payments, batch reversals, and batch refunds in Billing Care or through the Billing Care REST API.
- **noManualAllocationMandatory:** When the user runs validation, it allows validation to pass when a payment amount is less than the total due for the account.

For more information, see "About Billing Care Authorization Resources" in *BRM Security Guide*.

## Itemized Tax Calculation for Disputes and Settlements

You can now view details about the taxes applied or reversed during accounts receivable operations and payments at the following level:

- **Itemize:** BRM segregates tax details based on the tax code and tax jurisdiction.
- **Summarize:** BRM segregates tax details based on the tax code only.

If the **TaxReturnJuris** business parameter is enabled (set to **itemize**), you can see information based on the tax code and jurisdiction level for each item. The settled tax amount, settled taxed amount, and settled non-taxed amount will be shown as a consolidated amount for each item if it is set to **summarize** (default).

For more information, see "Working with Disputes" in *Billing Care Online Help*.

## Standardized Date and Time Formats

Date and time formats have been standardized across the Billing Care user interface. Earlier, the date used the standard dd/mm/yyyy format for displaying and inputting dates across all locales. It now uses a locale-specific date standard. The time format has been standardized to the 24-hour format regardless of the locale.

For more information, see "About Date and Time Formats" in *Billing Care Online Help*.

## Enhancements for Batch Payments, Refunds, and Reversals

The Billing Care UI now supports creating and editing batches and editing imported batches. You can create, edit, import, and validate batch payment files (**.pmt**) directly in the Billing Care UI, with batch templates stored in the database for efficiency. Key functionality includes validating batch files and processing them based on standard or custom templates, managing individual records within a batch, and handling errors by editing failed records and creating

new batches. You can also manually suspend payments requiring special handling and allocate payments to bills or items.

To support the Batch Payments feature, Billing Care includes the following enhancements:

- **Batch Creation and Editing:** You can create or import and edit batches directly with the Billing Care UI. See "Creating or Importing and Editing Batches" in *BRM Configuring and Collecting Payments* for more information.
- **Record Management:** Enhanced table interface allows you to add, edit, suspend, remove suspension, allocate, and delete individual records within batches. See "Working with Individual Records in Batches" in *BRM Configuring and Collecting Payments* for more information.
- **Validation and Submission:** You can see the results of validation in the GUI and fix incorrect batch entries before submitting them. See "Validating and Submitting Batches" in *BRM Configuring and Collecting Payments* for more information.
- **Template Management:** You can create, edit, or duplicate batch templates directly within the UI, simplifying batch processing setup. See "Working with Batch Templates" in *Billing Care Online Help* for more information.
- **Error Handling:** Manual suspension of payments and management of failed records facilitate error resolution and batch resubmission. See "Suspending a Payment in a Batch" and "Removing Suspension of a Payment in a Batch" in *Billing Care Online Help* for more instructions.

For detailed instructions, see "Batch Payments, Refunds, and Reversals" in *Billing Care Online Help* and "Processing Payment Batches in Billing Care" in *BRM Configuring and Collecting Payments*.

There are also new endpoints in the Billing Care REST API to support this feature:

- POST /bcws/webresources/v1.0/batchpayments/validate (Validate a Payment Batch)
- POST /bcws/webresources/v1.0/batchpayments/submit (Submit a Payment Batch)
- POST /bcws/webresources/v1.0/batchrefund/validate (Validate a Refund Batch)
- POST /bcws/webresources/v1.0/batchrefund/submit (Submit a Refund Batch)
- POST /bcws/webresources/v1.0/batchreversal/validate (Validate a Reversal Batch)
- POST /bcws/webresources/v1.0/batchreversal/submit (Submit a Reversal Batch)
- POST /bcws/webresources/v1.0/batchpayments/batchtemplates (Create a Batch Template)
- PUT /bcws/webresources/v1.0/batchpayments/batchtemplates/{id} (Update a Batch Template)
- DELETE /bcws/webresources/v1.0/batchpayments/batchtemplates/{id} (Delete a Batch Template)
- GET /bcws/webresources/v1.0/batchpayments/batchtemplates (Get Batch Templates)
- GET /bcws/webresources/v1.0/batchpayments/batchtemplates/{id} (Get a Batch Template by Template ID)

For more information about these endpoints, see *REST API Reference for Billing Care*.

## Tracking CSR Activity for Audit Purposes

When CSRs perform activity in Billing Care, it can now store user context information, such as the CSR's client machine IP address, in the following fields of the **/user\_activity** database object:

- **PIN\_FLD\_API\_USER**: Contains the Web Services Manager user. By default, it is set to NULL, but you can override this behavior using the Billing Care SDK.
- **PIN\_FLD\_EXTERNAL\_USER**: Contains the external CSR's login or ID. By default, it is set to the external login ID, but you can override this behavior using the Billing Care SDK.
- **PIN\_FLD\_NAP\_IP\_ADDRESS**: Contains the client machine's IP address. By default, Billing Care attempts to set it to the client machine's IP address by looking up the X-Forwarded-For header value. If it is not found, it is set to the Billing Care service's IP address. However, you can override this behavior using the Billing Care SDK.
- **PIN\_FLD\_CORRELATION\_ID**: Contains an ID to tag for collating an operation. By default, it is set to NULL, but you can override this behavior using the Billing Care SDK.



### Note:

The Web server must pass this information so Billing Care can persist it in the BRM database.

## Enhancements in Billing Care 15.0.0

This section lists the features introduced between Billing Care 12.0 Patch Set 8 and Billing Care 15.0.0.

For information about the features introduced between Billing Care 12.0 and Billing Care 12.0 Patch Set 8, see "[New Features in Billing Care](#)" in *BRM 12.0 Patch Set Release Notes*.

Billing Care 15.0.0 includes the following enhancements:

- [Oracle JavaScript Extension Toolkit Version Upgraded](#)
- [LUX Grids Changed to Oracle JET Tables](#)

## Oracle JavaScript Extension Toolkit Version Upgraded

Billing Care screens and dialog boxes now use an upgraded Oracle JavaScript Extension Toolkit (JET) version. The screens were also migrated to a new style and syntax to improve the client tool's overall look and feel.



### Note:

You must update any Billing Care customizations that use `ojComponent` knockout binding (`data-bind="ojComponent:{...}"`) to use custom element equivalents. This is because the Oracle JET 12.0.0 release has removed support for `ojComponent` knockout binding.



## LUX Grids Changed to Oracle JET Tables

Billing Care does not support LUX Libraries starting from the 15.0.0 release. All of the LUX grids have been changed to Oracle JET tables. Following is a list of the Billing Care windows that have been updated to use Oracle JET tables instead of LUX grids.

- Past Due
- All Unallocated Payments
- All Unallocated Adjustments
- Allocate Payment Simple View
- Allocate Payment Advance View
- Allocate Adjustment Simple View
- Allocate Adjustment Advance View
- Payment Applied View
- Payment Details View
- Items Affected View in 'Payment Applied'
- A/R Actions View
- All Open Disputes View
- Account Adjustment Details
- Account Adjustment Details Items Affected
- Bill Adjustment Details
- Bill Adjustment Details Items Affected
- Transfer Negative Balance



### Note:

This impacts the billing care SDK, because if you have customized a standard Billing Care screen using LUX grids, or if you are using LUX grids in your custom code, you must update the customization to use Oracle JET tables.

For more information, see *Billing Care Online Help*.

# 9

## New Features in Business Operations Center

Learn about the new features in Oracle Communications Business Operations Center.

Topics in this document:

- [New Features in Business Operations Center 15.1](#)
- [New Features in Business Operations Center 15.0.1](#)
- [New Features in Business Operations Center 15.0.0](#)

### New Features in Business Operations Center 15.1

Business Operations Center contains no new features or enhancements in Release 15.1.

### New Features in Business Operations Center 15.0.1

Business Operations Center 15.0.1 includes the following enhancements:

- [Standardized Date and Time Formats](#)

#### Standardized Date and Time Formats

Date and time formats have been standardized across the Business Operation Center user interface. Earlier, the date used the standard dd/mm/yyyy format for displaying and inputting dates across all locales. It now uses a locale-specific date standard. The time format has been standardized to the 24-hour format regardless of the locale.

For more information, see "About Date and Time Formats" in *Business Operations Center Online Help*.

### New Features in Business Operations Center 15.0.0

This section lists the features introduced between Business Operations Center 12.0 Patch Set 8 and Business Operations Center 15.0.0.

For information about the features introduced between Business Operations Center 12.0 and Business Operations Center 12.0 Patch Set 8, see "[New Features in Business Operations Center](#)" in *BRM 12.0 Patch Set Release Notes*.

Business Operations Center 15.0.0 includes the following enhancements:

- [Support for Assigning Roles to Custom Jobs](#)

#### Support for Assigning Roles to Custom Jobs

Business Operations Center now allows you to assign one or more roles to each custom job category. This will enable you to control which users have permission to access each custom job category. For example, you could restrict access to Custom Job Category 1 to users with the Junior CSR role and access to Custom Job Category 2 to users with the Manager role.

Previously, you assigned all custom job categories to the same role.

For information, see "Configuring Business Operations Center to Run Custom Applications" in *BRM System Administrator's Guide*.

# 10

## Opcode Changes

Learn about new and modified opcodes in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Standard Opcodes](#)
- [New Policy Opcodes](#)
- [Changed Standard Opcodes](#)
- [Changed Policy Opcodes](#)

For more information about the opcodes, see "Opcode Descriptions" in *BRM Opcode Guide*.

## New Standard Opcodes

[Table 10-1](#) lists the standard opcodes that have been introduced in BRM.

**Table 10-1 New FM Standard Opcodes**

New Standard Opcode	Description
PCM_OP_BILL_MOVE_ITEM	(15.1) Moves items from one bill object to another within the same bill unit.
PCM_OP_SUBSCRIPTION_SHARING_ROLLUP_BALANCE	(15.1) Rolls up the cumulative charges from members of a wholesale sharing group to the owner.
PCM_OP_CUST_ASSOCIATE_ROLE	(15.0.0) Associates the <b>/config/role</b> object to the respective service.
PCM_OP_CUST_CREATE_ROLE	(15.0.0) Creates a new <b>/config/role</b> object.
PCM_OP_CUST_DELETE_ROLE	(15.0.0) Deletes the <b>/config/role</b> object.
PCM_OP_CUST_UPDATE_ROLE	(15.0.0) Updates the <b>/config/role</b> object.
PCM_OP_INSTALLMENT_PROPOSAL	(15.0.0) Based on the input parameters, such as the installment amount, the installment term, and the start date, the opcode divides the installment amount into an equal number of installments. If the installment amount cannot be divided into equal installments, the opcode rounds it off to the nearest amount and adds the remaining amount to the last installment.
PCM_OP_JOB_PROCESS_DEFINITION	(15.0.0) Creates, modifies, and deletes a job definition created through Business Operations Center.

## New Policy Opcodes

[Table 10-2](#) lists the policy opcodes that have been introduced in BRM.

**Table 10-2 New FM Policy Opcodes**

New Policy Opcode	Description
PCM_OP_AR_POL_GET_ACCT_ACTION_ITEMS	(15.1) Allows you to add descriptions or fields to the PCM_OP_AR_GET_ACCT_ACTION_ITEMS opcode's output list.
PCM_OP_AR_POL_FILL_TAXINFO	(15.0.1) Allows you to change the tax code associated with the item adjustment. The item adjustment opcode only uses the tax code and tax supplier from the output list of this policy opcode.
PCM_OP_CONTRACT_POL_CANCEL_CONTRACT	(15.0.1) Allows you to customize how penalty charges are applied during contract cancellation.
PCM_OP_SUBSCRIPTION_POL_PREP_OFFERING	(15.0.1) Allows you to customize the purchase offering's input list.
PCM_OP_JOB_POL_POST_PROCESS_DEFINITION	(15.0.0) Allows for post processing validation.
PCM_OP_JOB_POL_VALIDATE_DEFINITION	(15.0.0) Validates the job definition object when it is being created.

## Changed Standard Opcodes

Table 10-3 lists the standard opcodes that have been modified in BRM.

**Table 10-3 Changed Standard Opcodes**

Changed Standard Opcode	Description
PCM_OP_BILL_MAKE_BILL	(15.1) Modified to allow rolling up <b>/item/sponsor</b> charges from sharing group members to the sharing group owner. It also contains the following new input list field: <ul style="list-style-type: none"> <li>PIN_FLD_BILL_OBJ: Used only for proforma invoices. Specifies the bill object POID that needs to be accepted or rejected after preinvoicing.</li> </ul>
PCM_OP_CUST_SET_BILLINFO	(15.1) Modified the PIN_FLD_BILLINFO array to include the following new input list field: <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: Whether to run the job for changing the billing day of month (DOM) immediately or defer it for later. Possible values are immediately (<b>0x1</b>) or deferred (<b>0x2</b>).</li> </ul> <b>Note:</b> This is applicable when the business profile of the parent account is set to a profile that has the <b>AsyncBDMChange</b> key set to <b>yes</b> .
PCM_OP_INV_DECODE_INVOICE_DATA	(15.1) Modified to include the following new input list fields: <ul style="list-style-type: none"> <li>PIN_FLD_INVOICE_DATA: Specifies the invoice data string to decode. This field is mutually exclusive with the PIN_FLD_STRING field.</li> <li>PIN_FLD_STRING: Specifies the aggregated data string to decode. This field is mutually exclusive with the PIN_FLD_INVOICE_DATA field.</li> </ul>
PCM_OP_SUBSCRIPTION_PURCHASE_DISCOUNT	(15.1) Modified to include the following new input list field: <ul style="list-style-type: none"> <li>PIN_FLD_LIFECYCLE_STATUS: Specifies the BRM status mapped to the life cycle status retrieved from the <b>/config/product_state_map</b> object.</li> </ul>
PCM_OP_SUBSCRIPTION_PURCHASE_PRODUCT	(15.1) Modified to include the following new input list field: <ul style="list-style-type: none"> <li>PIN_FLD_LIFECYCLE_STATUS: The BRM status mapped to the lifecycle status is retrieved from the <b>/config/product_state_map</b> object.</li> </ul>

Table 10-3 (Cont.) Changed Standard Opcodes

Changed Standard Opcode	Description
PCM_OP_SUBSCRIPTION_SHARING_GROUP_CREATE	(15.1) Modified the PIN_FLD_CONTEXT_INFO substruct to include this new input flist field: <ul style="list-style-type: none"> <li>PIN_FLD_SHARING_ROLLUP: Specifies whether a sharing group supports rolling up resources is (1) or not (0).</li> </ul>
PCM_OP_SUBSCRIPTION_SHARING_GROUP_MODIFY	(15.1) Modified the PIN_FLD_CONTEXT_INFO substruct to include this new input flist field: <ul style="list-style-type: none"> <li>PIN_FLD_SHARING_ROLLUP: Specifies whether a sharing group supports rolling up resources is (1) or not (0).</li> </ul>
PCM_OP_AR_GET_ACCT_BILLS PCM_OP_AR_GET_BILLS	(15.0.1) Modified the PIN_FLD_RESULTS output flist array to include this new field: <ul style="list-style-type: none"> <li>PIN_FLD_TOTAL_DUE: The total due for the bill.</li> </ul>
PCM_OP_BAL_TRANSFER_BALANCE	(15.0.1) Modified the PIN_FLD_TRANSFERS_INT0 output flist array to include this new substruct: <ul style="list-style-type: none"> <li>PIN_FLD_LOAN_INFO: Substruct for passing information about the subscriber's loan.</li> </ul>
PCM_OP_CONTRACT_CANCEL_CONTRACT PCM_OP_PRICE_COMMIT_SUBSCRIPTION_TERM PCM_OP_SUBSCRIPTION_CALC_QUOTE	(15.0.1) Modified the PIN_FLD_PENALTY_OPTIONS output flist field to include these additional values: <ul style="list-style-type: none"> <li>3: The penalty fee is calculated based on the remaining contract balance plus a flat termination fee.</li> <li>4: The penalty fee is calculated based on the remaining contract balance plus a prorated termination fee.</li> </ul>
PCM_OP_CONTRACT_CREATE_CONTRACT	(15.0.1) Modified to include the following new input flist field: <ul style="list-style-type: none"> <li>PIN_FLD_POID: Contains the type-only POID of the extended / <b>subscriber_contract</b> object.</li> </ul>
PCM_OP_CUST_COMMIT_CUSTOMER PCM_OP_CUST_MODIFY_CUSTOMER PCM_OP_SUBSCRIPTION_PURCHASE_DEAL	(15.0.1) Modified the PIN_FLD_CONTRACT_INFO substruct to include the following new input flist fields: <ul style="list-style-type: none"> <li>PIN_FLD_POID: Contains the partial POID of the subscriber contract (/ <b>subscriber_contract</b> object) to create. The type and database sub-fields are used during creation, and all other sub-fields are ignored.</li> <li>PIN_FLD_INHERITED_INFO: Contains inherited information for the / <b>subscriber_contract</b> object.</li> </ul>
PCM_OP_EXEC_SPROC	(15.0.1) Modified to include the following new input flist fields: <ul style="list-style-type: none"> <li>PIN_FLD_ARGS.PIN_FLD_ARG: The name of the argument.</li> <li>PIN_FLD_ARG: The name of the argument for the ref-cursor type.</li> </ul>
PCM_OP_LOAN_GET_LOAN	(15.0.1) Modified to include the following new input flist field: <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: The flag. The default is 0, which specifies to get the total loan amount and total service fee. A value of <b>0x01</b> (PIN_LOAN_FLG_GET_LOAN_LIMIT) specifies to return only the loan limit details.</li> </ul>
PCM_OP_PRICE_GET_PRICE_LIST PCM_OP_PRICE_SET_PRICE_LIST	(15.0.1) Modified the PIN_FLD_PENALTY_OPTIONS output flist field to include these additional values: <ul style="list-style-type: none"> <li>3: The penalty fee is calculated based on the remaining contract balance plus a flat termination fee.</li> <li>4: The penalty fee is calculated based on the remaining contract balance plus a prorated termination fee.</li> </ul>

Table 10-3 (Cont.) Changed Standard Opcodes

Changed Standard Opcode	Description
PCM_OP_PYMT_TOPUP	<p>(15.0.1) Modified the PIN_FLD_LOAN_INFO substruct to include these new output flist fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_AMOUNT: The amount consumed from the top-up against the subscriber's loans.</li> <li>PIN_FLD_AVAILABLE_LOAN_LIMIT: The available loan amount that can be granted to the subscriber.</li> <li>PIN_FLD_CREDIT_LIMIT: The maximum loan amount that can be granted to the subscriber.</li> <li>PIN_FLD_OUTSTANDING_AMOUNT: The outstanding loan amount that needs to be paid back by the subscriber.</li> </ul>
PCM_OP_AR_GET_ITEM_DETAIL	<p>(15.0.0) Modified the PIN_FLD_RESULTS array to include new output flist fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_TAXES.SETTLED_TAX: Contains the tax amount settled as part of the payment or adjustment.</li> <li>PIN_FLD_SETTLED_TAXED_AMOUNT: Contains the taxable charge settled as part of the payment or adjustment.</li> </ul>
PCM_OP_BILL_DEBIT	<p>(15.0.0) Modified to include this new input flist field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: The flag. Possible values are reserved, PIN_BILL_FLG_BILL_DEBIT_NC_ADJUSTMENT (1) or used for noncurrency account adjustments (2).</li> </ul>
PCM_OP_CUST_COMMIT_CUSTOMER	<p>(15.0.0) Modified the PIN_FLD_PRICE_TAGS array to include this new input flist field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_RESOURCE_ID: Contains the resource ID with the tag name to be overridden.</li> </ul>
PCM_OP_CUST_MODIFY_CUSTOMER	<p>(15.0.0) Modified to include new input flist fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_PRICE_TAGS.PIN_FLD_RESOURCE_ID: Contains the resource ID with the tag name to be overridden.</li> <li>PIN_FLD_RESOURCE_ID: Contains the resource ID.</li> </ul>
PCM_OP_INV_VIEW_INVOICE	<p>(15.0.0) This output flist field is removed:</p> <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul> <p>(15.0.0) This output flist field under the PIN_FLD_FORMATS array is removed:</p> <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul>
PCM_OP_JOB_PROCESS_TEMPLATE	<p>(15.0.0) Modified to include new output flist fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_DELETED_FLAG: Indicates whether the <b>job template</b> was deleted or marked as closed. It is used for the delete PIN_FLD_ACTION.</li> </ul>

Table 10-3 (Cont.) Changed Standard Opcodes

Changed Standard Opcode	Description
PCM_OP_PRICE_GET_PRICE_LIST	<p>(15.0.0) Modified to include new output flist fields under the PIN_FLD_PRODUCTS array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_OFFER_VALIDITY_ROUNDING: Determines validity rounding at the offer level. Its value can be <b>0 (NOT_SET)</b>, <b>1 (ON)</b>, or <b>2 (OFF)</b>. The default value is <b>0 (NOT_SET)</b>.</li> <li>PIN_FLD_SCALE_ROUNDING: Determines whether scale rounding is enabled. Its value can be <b>0 (OFF)</b> or <b>1 (ON)</b>. The default value is <b>0 (OFF)</b>.</li> </ul> <p>(15.0.0) Modified to include new output flist fields under the PIN_FLD_DISCOUNTS array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_DISCOUNT_VALIDITY_ROUNDING: Determines whether discount rounding is enabled. Its value can be <b>0 (NOT_SET)</b>, <b>1 (ON)</b>, or <b>2 (OFF)</b>. The default value is <b>0 (NOT_SET)</b>.</li> </ul> <p>(15.0.0) These output flist fields under the PIN_FLD_RATE_PLANS array is removed:</p> <ul style="list-style-type: none"> <li>PIN_FLD_OFFER_VALIDITY_ROUNDING</li> <li>PIN_FLD_SCALE_ROUNDING</li> </ul>
PCM_OP_PRICE_SET_PRICE_LIST	<p>(15.0.0) Modified to include new input flist fields under the PIN_FLD_PRODUCTS array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_OFFER_VALIDITY_ROUNDING: Determines validity rounding at the offer level. Its value can be <b>0 (NOT_SET)</b>, <b>1 (ON)</b>, or <b>2 (OFF)</b>. The default value is <b>0 (NOT_SET)</b>.</li> <li>PIN_FLD_SCALE_ROUNDING: Determines whether scale rounding is enabled. Its value can be <b>0 (OFF)</b> or <b>1 (ON)</b>. The default value is <b>0 (OFF)</b>.</li> </ul> <p>(15.0.0) Modified to include new input flist fields under the PIN_FLD_DISCOUNTS array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_DISCOUNT_VALIDITY_ROUNDING: Determines whether discount rounding is enabled. Its value can be <b>0 (NOT_SET)</b>, <b>1 (ON)</b>, or <b>2 (OFF)</b>. The default value is <b>0 (NOT_SET)</b>.</li> </ul> <p>(15.0.0) This input flist field under the PIN_FLD_RATE_PLANS array is removed:</p> <ul style="list-style-type: none"> <li>PIN_FLD_OFFER_VALIDITY_ROUNDING</li> <li>PIN_FLD_SCALE_ROUNDING</li> </ul>
PCM_OP_PYMT_COLLECT	<p>(15.0.0) Modified to include new input flist fields under the PIN_FLD_CHARGES array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_INCLUDE_CHILDREN: Indicates whether to pick only the bill's items or all items for the entire hierarchy. It is used with <b>bill_object</b>. If it is set to <b>0</b>, it picks items only from that bill. If it is set to <b>1</b>, it includes items from the AR bill.</li> <li>PIN_FLD_BILL_OBJ: Contains the bill object from an <b>/event/billing/charge</b> event that is being recovered. It is applicable only when PIN_FLD_COMMMAND is set to PIN_CHARGE_CMD_RECOVER_PAYMENT.</li> </ul> <p>(15.0.0) Modified to include new output flist fields under the PIN_FLD_ITEMS array:</p> <ul style="list-style-type: none"> <li>PIN_FLD_TAXES: Contains the settled payment information per tax code per jurisdiction level.</li> </ul>



**Table 10-3 (Cont.) Changed Standard Opcodes**

Changed Standard Opcode	Description
PCM_OP_RATE_EVENT	(15.0.0) Modified to include new output flist entities: <ul style="list-style-type: none"> <li>PIN_FLD_RATE_PLAN_SELECTOR_OBJ field: Contains the POID for the rate plan selector object.</li> <li>PIN_FLD_RATE_PLAN_SELECTORS array: Contains the first non-matching column of the rate plan selector rows when the rating status is 21.</li> </ul>
PCM_OP_SUBSCRIPTION_PURCHASE_PRODUCT	(15.0.0) Modified to include this new input flist field under the PIN_FLD_PRICE_TAGS array: <ul style="list-style-type: none"> <li>PIN_FLD_RESOURCE_ID: Contains the resource ID.</li> </ul>
PCM_OP_SUBSCRIPTION_SET_PRODINFO	(15.0.0) Modified to include this new input flist field under the PIN_FLD_PRICE_TAGS array: <ul style="list-style-type: none"> <li>PIN_FLD_RESOURCE_ID: Contains the resource ID.</li> </ul>

## Changed Policy Opcodes

Table 10-4 lists the policy opcodes that have been modified in BRM.

**Table 10-4 Changed Policy Opcodes**

Changed Policy Opcode	Description
PCM_OP_BILL_POL_CALC_PYMT_DUE_T	(15.1) Modified to include the following new input flist fields: <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: Field for passing flags to identify proforma invoices.</li> <li>PIN_FLD_PREINVOICE_VALIDITY_T: Field that specifies the date at which a proforma invoice is automatically accepted.</li> </ul>
PCM_OP_CUST_POL_ENCRYPT_PASSWORD	(15.1) Modified to include the following new input flist field: <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: Field for passing the flag value to encode a password string.</li> </ul>
PCM_OP_CONTRACT_POL_PREP_CONTRACT	(15.0.1) Modified to include this new input flist substruct: <ul style="list-style-type: none"> <li>PIN_FLD_INHERITED_INFO: Substruct for passing contract-related fields.</li> </ul>
PCM_OP_SUBSCRIPTION_POL_SPEC_CANCEL	(15.0.1) Modified to include this new input flist array: <ul style="list-style-type: none"> <li>PIN_FLD_FLAGS: Array for action flags, aligning the end date of rollover buckets.</li> </ul>
PCM_OP_INV_POL_FORMAT_INVOICE	(15.0.0) This input flist field under the PIN_FLD_INHERITED_INFO substruct is removed: <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul>
PCM_OP_INV_POL_FORMAT_VIEW_INVOICE	(15.0.0) This input flist field is removed: <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul> (15.0.0) This output flist field under the PIN_FLD_FORMATS array is removed: <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul>
PCM_OP_INV_POL_PREP_INVOICE	(15.0.0) This input flist field under the PIN_FLD_INHERITED_INFO substruct is removed: <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM</li> </ul>

# 11

## Storable Class Changes

Learn about new and modified storable classes in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Storable Classes](#)
- [Changed Storable Classes](#)

For more information about storable classes, see *Storable Class Reference*.

### New Storable Classes

[Table 11-1](#) lists the storable classes that have been introduced in BRM.

**Table 11-1 New Storable Classes**

New Storable Class	Description
<b>/job/bdom</b>	(15.1) Stores details about an asynchronous billing day of month (DOM) job to run. It contains information about the bill unit, new billing DOM, and status of the job.
<b>/tmp_sharing_rollup_imp</b>	(15.1) Temporarily stores the non-currency balances from a sharing group member until they are rolled up into the owner.
<b>/config/batch_templates</b>	(15.0.1) Stores batch processing-related template data.
<b>/config/batch_templates/payment</b>	(15.0.1) Stores payment-related batch template data.
<b>/config/batch_templates/refund</b>	(15.0.1) Stores refund-related batch template data.
<b>/config/batch_templates/reversal</b>	(15.0.1) Stores reversal-related batch template data.
<b>/config/maxlength_validate</b>	(15.0.0) Stores business logic configuration parameters.
<b>/config/price_tags</b>	(15.0.0) Stores information of all the permitted <b>price_tags</b> that can be configured in offer.
<b>/config/role</b>	(15.0.0) Defines the permissions of a user.
<b>/event/job_definition/create</b>	(15.0.0) Records information about created <b>/job_definition</b> objects.
<b>/event/job_definition/delete</b>	(15.0.0) Records information about deleted <b>/job_definition</b> objects.
<b>/event/job_definition</b>	(15.0.0) Records information about <b>/job_definition</b> objects.
<b>/event/job_definition/modify</b>	(15.0.0) Records information about modified <b>/job_definition</b> objects.

### Changed Storable Classes

[Table 11-2](#) lists the storable classes that have been modified in BRM.

Table 11-2 Changed Storable Classes

Changed Storable Class	Description
<b>/account</b>	(15.1) Contains the following new field: <ul style="list-style-type: none"> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> </ul>
<b>/bill</b>	(15.1) Contains the following new field: <ul style="list-style-type: none"> <li>PIN_FLD_PREINVOICE_VALIDITY_T specifies the date at which a proforma invoice is automatically accepted.</li> </ul>
<b>/config/taxcodes_map</b>	(15.1) Contains the following new fields: <ul style="list-style-type: none"> <li>PIN_FLD_GL_ID associates a G/L ID to a tax code.</li> <li>PIN_FLD_GLID_NAME is the unique name for the associated G/L ID.</li> </ul>
<b>/event</b>	(15.1) Contains the following new array: <ul style="list-style-type: none"> <li>PIN_FLD_EVENT_MAP holds a list of rating group-specific information.</li> </ul>
<b>/event/billing/discount/action</b>	(15.1) Contains the following new fields under the PIN_FLD_ACTION_INFO array: <ul style="list-style-type: none"> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> <li>PIN_FLD_NAME specifies the name of the <b>/purchased_discount</b> object.</li> <li>PIN_FLD_LIFECYCLE_STATUS specifies the lifecycle status.</li> <li>PIN_FLD_BUNDLE_LEVEL specifies the bundled hierarchy level.</li> </ul>
<b>/event/billing/product/action</b>	(15.1) Contains the following new field: <ul style="list-style-type: none"> <li>PIN_FLD_IS_BUNDLE specifies the top-level product in a bundle hierarchy.</li> <li>PIN_FLD_PRODUCT_CHARACTERISTIC_OBJ specifies the POID of the product characteristic.</li> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> <li>PIN_FLD_NAME specifies the name of the <b>/purchased_discount</b> object.</li> <li>PIN_FLD_LIFECYCLE_STATUS specifies the life cycle status.</li> <li>PIN_FLD_BUNDLE_LEVEL specifies the bundled hierarchy level.</li> </ul>
<b>/history_bills</b>	(15.1) Contains the following new field: <ul style="list-style-type: none"> <li>PIN_FLD_PREINVOICE_VALIDITY_T specifies the date at which a proforma invoice is automatically accepted.</li> </ul>
<b>/item</b>	(15.1) The PIN_FLD_FLAGS input flist field includes the following additional value: <ul style="list-style-type: none"> <li>PIN_ITEM_FLAG_FROZEN defines that the <b>/item</b> is frozen and no accounts receivable operations are allowed on it.</li> </ul>

Table 11-2 (Cont.) Changed Storable Classes

Changed Storable Class	Description
<b>/purchased_discount</b>	<p>(15.1) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_PRODUCT_CHARACTERISTIC_OBJ specifies the POID of the product characteristic.</li> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> <li>PIN_FLD_NAME specifies the name of the <b>/purchased_discount</b> object.</li> <li>PIN_FLD_LIFECYCLE_STATUS specifies the life cycle status.</li> <li>PIN_FLD_BUNDLE_LEVEL specifies the bundled hierarchy level.</li> </ul>
<b>/purchased_product</b>	<p>(15.1) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_PRODUCT_CHARACTERISTIC_OBJ specifies the POID of the product characteristic.</li> <li>PIN_FLD_IS_BUNDLE specifies the top-level product in a bundle hierarchy.</li> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> <li>PIN_FLD_NAME specifies the name of the <b>/purchased_discount</b> object.</li> <li>PIN_FLD_LIFECYCLE_STATUS specifies the life cycle status.</li> <li>PIN_FLD_BUNDLE_LEVEL specifies the bundled hierarchy level.</li> </ul>
<b>/service</b>	<p>(15.1) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> </ul>
<b>/uniqueness</b>	<p>(15.1) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_IDENTIFICATION_CODE is a unique external ID for identifying an account.</li> </ul>
<b>/history_subscriber_contract</b> <b>/subscriber_contract</b>	<p>(15.0.1) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_MINIMUM_CONTRACT_END_T specifies the timestamp when the contract's minimum length ends.</li> </ul> <p>Also, the PIN_FLD_PENALTY_OPTIONS field includes these additional values:</p> <ul style="list-style-type: none"> <li><b>3:</b> The penalty fee is calculated based on the remaining contract balance plus a flat termination fee.</li> <li><b>4:</b> The penalty fee is calculated based on the remaining contract balance plus a prorated termination fee.</li> </ul>

Table 11-2 (Cont.) Changed Storable Classes

Changed Storable Class	Description
<b>/subscription_terms</b>	<p>(15.0.1) Contains the following new fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_MINIMUM_TERM_LENGTH specifies the minimum length that a customer must stay in the contract. If customers cancel early, they must pay the remaining balance up to the minimum contract length.</li> <li>PIN_FLD_MINIMUM_TERM_UNIT specifies the unit associated with the minimum term length, such as days, months, and years.</li> </ul> <p>Also, the PIN_FLD_PENALTY_OPTIONS field includes these additional values:</p> <ul style="list-style-type: none"> <li><b>3:</b> The penalty fee is calculated based on the remaining contract balance plus a flat termination fee.</li> <li><b>4:</b> The penalty fee is calculated based on the remaining contract balance plus a prorated termination fee.</li> </ul>
<b>/discount</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_DISCOUNT_VALIDITY_ROUNDING specifies validity rounding at the discount level. The default value is <b>0</b>.</li> </ul>
<b>/event/billing/discount/action</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_UNIQUE_ID is a unique ID that is used as an external ID.</li> </ul>
<b>/event/billing/product/action</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_UNIQUE_ID is a unique ID that is used as an external ID.</li> </ul>
<b>/event</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_GRANTED_BAL specifies the granted amount impacted for a sub_balance entry.</li> </ul>
<b>/invoice_detail</b>	<p>(15.0.0) The following field has changed from an integer data type to a 64-bit integer type:</p> <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM (under PIN_FLD_FORMATS) is a generic user-definable header number field for each format.</li> </ul>
<b>/invoice</b>	<p>(15.0.0) The following fields have changed from an integer data type to a 64-bit integer type:</p> <ul style="list-style-type: none"> <li>PIN_FLD_HEADER_NUM is a generic user-definable header number field.</li> <li>PIN_FLD_HEADER_NUM (under PIN_FLD_FORMATS) is a generic user-definable header number field for each format.</li> </ul>
<b>/job_definition</b>	<p>(15.0.0) Contains the following new fields:</p> <ul style="list-style-type: none"> <li>PIN_FLD_RESOURCE_NAME is a unique job resource name.</li> <li>PIN_FLD_CREATED_BY is a Business Operations Center user name that creates the job definition.</li> <li>PIN_FLD_MODIFIED_BY is a Business Operations Center user name that modifies the job definition.</li> <li>PIN_FLD_STATUS specifies the status of the job definition. The value can be active or expired.</li> </ul>
<b>/purchased_discount</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_UNIQUE_ID is a unique ID that is used as an external ID.</li> </ul>
<b>/purchased_product</b>	<p>(15.0.0) Contains the following new field:</p> <ul style="list-style-type: none"> <li>PIN_FLD_UNIQUE_ID is a unique ID that is used as an external ID.</li> </ul>

Table 11-2 (Cont.) Changed Storable Classes

Changed Storable Class	Description
<b>/service/admin_client</b>	(15.0.0) Contains the following new fields: <ul style="list-style-type: none"><li>• PIN_FLD_CONFIG_ROLE is a substruct containing configuration profile objects.</li><li>• PIN_FLD_CONFIG_PROFILE_OBJ specifies the link to configuration profile objects for which the object was created.</li></ul>
<b>/service/pcm_client</b>	(15.0.0) Contains the following new fields: <ul style="list-style-type: none"><li>• PIN_FLD_CONFIG_ROLE specifies the configuration profile object.</li><li>• PIN_FLD_CONFIG_PROFILE_OBJ specifies a link to the configuration profile object for which the object was created.</li></ul>

# 12

## Event Notification Changes

Learn about new and modified event notifications in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Event Notifications](#)
- [Changed Event Notifications](#)

### New Event Notifications

[Table 12-1](#) lists the event notifications that have been introduced in BRM.

**Table 12-1 New Event Notifications**

New Event Notification	Description
<b>/event/notification/billing/item/move</b>	(15.1) Generated when an item is moved from one bill to another.
<b>/event/notification/billing/updateBalances</b>	(15.1) Updates the currency balances in ECE for parent and child accounts during wholesale billing.
<b>/event/notification/billing/updateRollupBalances</b>	(15.1) Generated when a sharing group member's balance is rolled up to the sharing group owner.
<b>/event/notification/service/aac/modify</b>	(15.0.1) Generated when a service's AAC fields are modified.

### Changed Event Notifications

No event notifications have been modified in BRM 15.0 or later.

# 13

## Business Parameter Changes

Learn about new business parameters in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Business Parameters for 15.1](#)
- [New Business Parameters for 15.0.1](#)
- [New Business Parameters for 15.0.0](#)

### New Business Parameters for 15.1

The following tables list the new business parameters for BRM 15.1.

[Table 13-1](#) lists the new billing business parameters.

**Table 13-1** New Entries in `bus_params_billing.xml`

Business Parameter	Description
<b>PreInvoiceValidity</b>	Specifies the number of days a proforma bill and invoice remains in a <b>PreInvoiceInProgress</b> state, after which it is automatically accepted. The default is <b>0</b> , making the proforma bill and invoice valid indefinitely. See "Defining the Default Validity of Proforma Invoices" in <i>BRM Designing and Generating Invoices</i> .

[Table 13-2](#) lists the new customer business parameters.

**Table 13-2** New Entries in `bus_params_customer.xml`

Business Parameter	Description
<b>SkipCurrencyCheckForChild</b>	Specifies whether to ignore checking for a match between the currency for a paying child account and the currency for the parent. This parameter does not impact non-paying child accounts. The default is <b>disabled</b> .

### New Business Parameters for 15.0.1

The following tables list the new business parameters for BRM 15.0.1.

[Table 13-3](#) lists the new accounts receivable business parameters.



Table 13-3 New Entries in bus\_params\_AR.xml

Business Parameter	Description
<b>EventAdjustmentUnallocation</b>	Controls the transferable amount in event adjustments so that the sign of an item due will not change. The default is <b>disabled</b> . See "Enabling Accurate Handling of Event level Adjustment Amount" in <i>BRM Managing Accounts Receivable</i> .
<b>UseEventRoundingRulesForAdjustment</b>	Controls the rounding rules for event adjustments. The default is <b>disabled</b> . See "Enabling Event Rounding Rules for Adjustment" in <i>BRM Managing Accounts Receivable</i> .

Table 13-4 lists the new billing business parameters.

Table 13-4 New Entries in bus\_params\_billing.xml

Business Parameter	Description
<b>AddChildDueInIntermediateParentBill</b>	Enables a child's due, adjusted, dispute, write-off, transferred, and received balance impacts to be added to the intermediate parent's balances. The default is disabled ( <b>0</b> ). See "Adding Child Due Amount in Intermediate Parent Account" in <i>BRM Managing Customers</i> .

## New Business Parameters for 15.0.0

The following tables list the new business parameters for BRM 15.0.0.

Table 13-5 lists the new billing flow business parameters.

Table 13-5 New Entries in bus\_params\_billing\_flow.xml

Business Parameter	Description
<b>BillingFlowSkipCheckForCyclicDSG</b>	Controls whether to skip the discount sharing group cyclic relationship check during trial billing. The default is <b>disabled</b> .

Table 13-6 lists the new rating business parameters.

Table 13-6 New Entries in bus\_params\_rating.xml

Business Parameter	Description
<b>TaxReturnJuris</b>	Controls whether taxes should be summarized by jurisdiction level: <ul style="list-style-type: none"> <li><b>summarize</b>: BRM reports the consolidated settled tax amount, settled taxed amount, and settled non-taxed amount for each item. This is the default.</li> <li><b>itemize</b>: BRM reports the settled tax and settled taxed amount at the tax code and jurisdiction level.</li> </ul> For more information, see "Configuring Itemized Taxation for A/R and Payments" in <i>BRM Calculating Taxes</i> .

Table 13-7 lists the new subscription business parameters.

**Table 13-7 New Entries in bus\_params\_subscription.xml**

Business Parameter	Description
DeleteSharingGroupDuringTermination	Controls whether to delete the sharing group and sharing group members during account or service cancellation. The default is <b>disabled</b> .

[Table 13-8](#) lists the new system administration business parameters.

**Table 13-8 New Entries in bus\_params\_system.xml**

Business Parameter	Description
CMAuthorization	Controls whether to perform fine-grained authorization for pcm_client and thick client applications. The default is <b>enabled</b> . For information, see "Managing Login Names and Passwords for BRM Access" in <i>BRM System Administrator's Guide</i> .

# Schema and Index Changes

Learn about new and changed schemas and indexes in Oracle Communications Billing and Revenue Management (BRM) Suite.

- [Schema and Index Changes in 15.1](#)
- [Schema and Index Changes in 15.0.1](#)
- [Schema and Index Changes in 15.0.0](#)

## Schema and Index Changes in 15.1

For information about the schema and index changes between BRM 15.0 and BRM 15.1, see [BRM Schema and Index Changes](#).

## Schema and Index Changes in 15.0.1

BRM 15.0.1 includes the following schema and index changes:

- The following tables are added:
  - CONFIG\_BATCH\_TEMPLATES\_FLDS\_T
  - CONFIG\_BATCH\_TEMPLATES\_T
- The following indexes are added:
  - I\_TOPUP\_BAL\_GRP\_\_ID
  - I\_CONFIG\_BATCH\_TEMPLATES\_\_ID
- The columns in [Table 14-1](#) are added:

**Table 14-1 Columns Added**

Table	Column Added
AU_SUBSCRIBER_CONTRACT_T	MINIMUM_CONTRACT_END_T
HISTORY_SUBSCRIBER_CONTRACT_T	MINIMUM_CONTRACT_END_T
REVENUE_DISTRIBUTION_T	MINIMUM_CONTRACT_AMOUNT
SUBSCRIBER_CONTRACT_T	MINIMUM_CONTRACT_END_T
SUBSCRIPTION_TERMS_T	MINIMUM_TERM_LENGTH MINIMUM_TERM_UNIT

## Schema and Index Changes in 15.0.0

For information about the schema and index changes between BRM 12.0 and BRM 15.0.0, see [BRM Schema and Index Changes](#).

# 15

## Utility Changes

Learn about new and modified utilities in Oracle Communications Billing and Revenue Management (BRM).

Topics in this document:

- [New Utilities](#)
- [Changed Utilities](#)

### New Utilities

[Table 15-1](#) lists the utilities that have been introduced in BRM.

**Table 15-1** New Utilities

New Utility	Description
<code>pin_rollup_sharing_balances</code>	(15.1) Use to allow roll up of cumulative charges for non-currency resources from a wholesale sharing group member to the owner. See "pin_rollup_sharing_balances" in <i>BRM Configuring and Running Billing</i> .
<code>pin_update_bdom</code>	(15.1) Use to change the billing day of month (DOM) for the parent and child accounts in a large hierarchy asynchronously. See "pin_update_bdom" in <i>BRM Configuring and Running Billing</i> . <b>Note:</b> This is applicable only when the parent account's business profile is set to a profile with the <b>AsyncBDOMChange</b> key set to <b>yes</b> .
<code>generate_config_xml_from_opcode_spec.py</code>	(15.0) Use to modify the maximum length of an opcode flist field or create a loadable configuration file from an opcode specification for a custom opcode. See "generate_config_xml_from_opcode_spec.py" in <i>BRM Developer's Guide</i> .

### Changed Utilities

There are no changed utilities in BRM Suite 15.1.

# 16

## Known Problems

Learn about known problems in Oracle Communications Billing and Revenue Management (BRM) Suite and the appropriate workarounds.

BRM Suite 15.0 and 15.1 contain no known problems.

# Deprecated Features

Learn about features that have been deprecated in Oracle Communications Billing and Revenue Management (BRM) Suite.

Topics in this document:

- [Deprecated Features in 15.1](#)
- [Deprecated Features in 15.0.1](#)
- [Deprecated Features in 15.0.0](#)

## Deprecated Features in 15.1

No features were deprecated in BRM Suite 15.1.

## Deprecated Features in 15.0.1

No features were deprecated in BRM Suite 15.0.1.

## Deprecated Features in 15.0.0

[Table 17-1](#) lists the features that have been deprecated in BRM Suite 15.0.0.

**Table 17-1** Deprecated Features in BRM Suite 15.0.0

Component	Description
Account Synchronization Manager	BRM and ECE no longer support Account Synchronization Manager (dm_ifw_sync). You now use Oracle Data Manager (DM) to synchronize data between ECE and the BRM database.
Business Configuration Center	BRM no longer supports Business Configuration Center (BCC).
Collections Center	BRM no longer supports the Collections Center client application. You must now use Billing Care instead for collections or debt management tasks. For more information, see "Collections" in <i>Billing Care Online Help</i> .
Payment Tool	BRM no longer supports the Payment Tool client application. You must now use Billing Care instead for processing payments. For more information, see "Payments" in <i>Billing Care Online Help</i> .
Synchronization Queue Manager	BRM no longer supports Synchronization Queue Manager (dm_aq). You now use Oracle DM to synchronize pricing data between BRM and external customer relationship management (CRM) applications.