

Oracle® Retail Demand Forecasting

Release Notes

Release 15.0

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Oracle Retail Demand Forecasting (RDF) is a statistical and promotional forecasting solution. It uses state-of-the-art modeling techniques to produce high quality forecasts with minimal human intervention. Forecasts produced by the Demand Forecasting system enhance the retailer's supply chain planning, allocation, and replenishment processes, enabling a profitable and customer-oriented approach to predicting and meeting product demand.

All Oracle Retail Grade and Oracle Retail Curve documentation is included with the RDF documentation. The packaging and delivery of Curve and Grade remains the same.

Note: Because RDF, Curve, and Grade use the Oracle Retail Predictive Application Server (RPAS) platform, Oracle Retail recommends that you review the *Oracle Retail Predictive Application Server Release Notes* for fixed and known issues that may affect RDF.

In addition, RPAS 13.3 and later releases have significant technical enhancements related to hierarchy management (such as integer indexing) that have an effect on the configuration and maintenance of RDF, Curve, and Grade. You must upgrade to key RPAS versions and complete the upgrade process as described in the chapter, "Patch Installation" in the *Oracle Retail Demand Forecasting Installation Guide* before upgrading to a 15.0 RDF domain.

Grade Overview

Grade is a clustering tool that provides insight into how various parts of a retailer's operations can be grouped together. Typically, a retailer may cluster stores over item sales to create logical groupings of stores based upon sales of particular products. This provides increased visibility to where products are selling, and it allows the retailer to make more accurate decisions in merchandising. Beyond this traditional use of clusters, Grade is flexible enough to cluster any business measure based on products, locations, time, promotions, customers, or any hierarchy configured in the solution.

Key Grade functionality includes:

- Two methods of creating Grades/Clusters:
- Breakpoints: the sorting of data points into groups based on user-defined indexes
- Clustering, or the BaNG Algorithm: the optimization of data points into clusters based on the user-defined number of clusters

- Group By capabilities: support the segmentation of clusters for more detailed and focused cluster generation
- Clustering statistics: provide insight into the relationship of members within a cluster and how all clusters relate to one another
- Cluster What-if: allows user changes to members assigned to clusters and the review of recalculated clustering statistics

Regardless of the method employed to create clusters, Grade is designed to support the decision-making process necessary to create effective and actionable groupings of data.

Curve Overview

Curve is an optional automated predictive solution that can generate ratio arrays from historical data at user-specified intersections. The profiles generated by Curve can be used for various purposes; for example, they can be used to convert the organization level assortment plans into base level weekly sales forecasts and to generate seasonal forecasts, daily forecasts, or new product forecasts using lifecycle profiles.

Important Steps to Address RMS/RPAS/RDF Integration

This section describes important steps to address the RMS/RPAS/RDF integration.

Change of Class and Subclass Naming

Oracle Retail Merchandising System (RMS) sends hierarchy files to Oracle Retail Demand Forecasting (RDF). RMS ensures that a class is unique to only its department and a subclass is unique to only its own class. In other words, Dept10 and Dept. 20 both can contain Class 100. However, within RPAS, unless class names are unique across the domain, it results in a multi-parent problem. Prior to Release 13.1.2, RDF tried to ensure uniqueness by concatenation of positions as follows:

- RDF Class = RMS Dept + RMS Class
- RDF Subclass = RMS Dept + RMS Class + RMS Subclass

However, this can result in a multi-parent problem. For example:

RMS Department	RMS Class	RPAS/RDF Class
10	110	10110
101	10	10110

In this scenario, Clss10110 rolls into both Dept10 and Dept101. This is not acceptable in any RPAS application.

Resolution

Position names are made unique by adding an underscore. In the previous example, the classes would be named `Clss10_110` and `Clss101_10`. However, when these position names are corrected and new hierarchy files are created, the existing class/subclass name no longer exists. Therefore, if the upgrade process is not specifically followed, any data that was stored at the class or subclass level (such as `Clss10110`) is erased.

Important: Failure to follow these upgrade instructions could result in data loss.

The following upgrade process needs to be followed only by the customers who:

- Use standard integration between RMS and RPAS based applications (other than AIP).
- Have stored data at class or subclass levels.
- Upgrade from a version prior to 13.0.4.18 to 13.0.4.18 or later. Those customers must apply the [Upgrade Process for Class and Subclass Naming](#). In the future, customers already on 13.0.4.18 or later do not need to use this process again.

Upgrade Process for Class and Subclass Naming

1. Point the environment variable `RPAS_HOME` to the new `RPAS_HOME`.
2. Run the script `$RPAS_HOME/rfx/src/rmse_rpas_merchhier.ksh` to generate the `rmse_rpas_merchhier.dat` file. This is how the new position names are generated.
3. Run `repos.ksh` with the `-a n` flag to produce the position rename file and run **renamePositions** without applying the changes. Examine the log file `PRODrename.log` for errors.
4. When ready, run the `repos.ksh` script without the `-a y` flag to apply the changes.

Change of Position Label Widths

Fields lengths for RDF hierarchies were increased to accept wider labels from RMS. These new field lengths are currently not patchable directly in any RPAS domain. Therefore, the following upgrade process must be followed:

Upgrade Process for Field Lengths

All customers using 13.0.4.18 and earlier should perform the following steps every time a new hot fix is applied.

1. Export the following environment variables in the environment before running the upgrade scripts.
 - `UPGRADE_HOME`: This variable should point to the path of upgrade scripts where `environment.ksh`, `updateschemafiles.ksh`, `updatetoolsconfiguration.ksh`, and other configuration files are present.
 - `RDF_DOMAIN_PATH`: The path of RDF domain which you are going to patch. The dimension field length of this RDF domain is taken and applied to the configuration and schema files.
 - `RDF_SCHEMA_DIR`: The RETL RDF schema files directory. This must be the latest release directory, which you use for patching. It points to the `SCHEMA` files location in the release, which you use for patching the RDF domain.

- TOOLS_CONFIG_DIR: The Configuration Tools XML files directory. It points to the directory where the `hierarchy.xml` file is present. It must be the latest release directory which you use for patching.
 - UPGRADE_BACKUP_DIR: A backup of SCHEMA and `hierarchy.xml` files is kept in this directory.
2. Set up the following upgrade scripts:
 - The `updateschemafiles.ksh` script updates the dimension field length of schema files to the length as available in the domain.
 - The `updatetoolsconfiguration.ksh` script updates the dimension field length of configuration files to the length as available in the domain.
 3. Change the directory to UpgradeScripts directory.

```
$ cd UpgradeScripts
```
 4. Run `updatetoolsconfiguration.ksh`. This updates the `hierarchy.xml` file.

```
$ ./ updatetoolsconfiguration.ksh
```
 5. Run `updateschemafiles.ksh`. This updates the RETL RDF schema files.

```
$ ./ updateschemafiles.ksh
```

Note: For added visibility for retailers, these instructions are included in both the *Oracle Retail Demand Forecasting Release Notes* and the *Oracle Retail Demand Forecasting Installation Guide*. For more information, see the *Oracle Retail Demand Forecasting Installation Guide*.

Upgrade Note

While not directly related to RDF, the 13.3 Release of Oracle Retail Predictive Application Server (RPAS) has undergone a major change to simplify hierarchy administration. Full details of these changes are outlined in the 13.3 *Oracle Retail Predictive Application Server Release Notes*. Due to these changes, configuration updates have been made to RDF, and you will need to perform additional steps to upgrade your RDF domain, such as setting dimension sizes. The upgrade to RPAS 13.3 or later for this application includes a conversion process in addition to the normal upgrade process. Details are provided in the chapter, "Patch Installation", in the *Oracle Retail Demand Forecasting Installation Guide*.

Upgrading to 15.0

When upgrading to RDF version 15.0, if the current version is older than 14.0 and a life cycle profile was configured in Curve, then the domains need to be rebuilt. Patching will not work.

The GA version of CPEM is not upgradeable to version 15.0 from any other previous versions. The two main reasons are the changes in the cannibalization level, and the requirement for item/store level data.

Hardware and Software Requirements

See the Oracle Retail Demand Forecasting Installation Guide for information about the following:

- Hardware and software requirements
- Oracle Retail application software compatibility information

Functional Enhancements

RDF 15.0 includes the following functional enhancements.

Flexible Grouping and Clustering Items and Locations

For baseline forecasting generation, RDF uses the source level concept. The idea behind source level forecasting is that the shape of the forecast is derived from the demand of a group of similar items, while the magnitude is given by an item's individual selling pattern. Ideally the source level intersection is high enough so the noise in demand at the item level is averaged out, but low enough such that an item's demand details do not become indistinct. The best way to achieve this is to group items with similar demand characteristics and use them to generate the shape of the forecast.

Generally, the items participating in a source level forecasting were part of the same dimension of the merchandise hierarchy. The same holds for stores, who were part of the same dimension in the location hierarchy. For instance if a source level was defined at the subclass/region intersection, all items in a certain subclass in all the stores of a certain region would determine and share the shape of the forecast. The shape of the forecast is accurate/as expected assuming all items in all stores within the source level have a similar demand pattern. However, in some cases this proves to be a hard assumption to meet; especially if the intersection is at a higher level, like department and chain.

The solution is to be able to group any item/stores that are similar. The similarity can be defined by retailer, and for the generally-available version of RDF, Oracle Retail makes recommendations. Examples of similar items could include items that:

- Started selling in summer (For example, May thru June, with a short lifecycle)
- Have max sales less than 10 units per week, and are selling year-round
- Have low variability and sell more than 50 units a week
- Are winter seasonal items
- Are summer seasonal items

Note: This requirement is similar to ad-hoc populating location and item groups in alternate hierarchies in the loc and prod hierarchies. However, it is even more flexible than the alternate hierarchies, because it is down to item/location, as opposed to group of items by group of locations.

Attribute Based New Item Modeling

A key part of the business of any retailer is the introduction of new items in the assortment and the opening of new stores. There is limited, if any, historical demand for those new items, and it is not trivial to generate forecasts for them. One way of doing it is to assign like items and derive the forecasts of the new items from the forecast of existing items. The challenge with this approach is the manual assignment of like item or sister stores. It is both time consuming, and there is no guarantee that the selection is appropriate. To help with the challenges, RDF is enabled to store attributes that characterize an item. Based on attributes and their importance (attribute weights), RDF can calculate similarities among new and existing items, and automatically recommend the best fit. This automated approach reduces the time spent by the RDF user to set up and manage new items. It also increases the forecast accuracy of new items, since the like item recommendation is optimized, rather than manual.

The functionality starts with alerts that guide the user through the review and approval process of like item recommendations. Worksheets guide the user through the approval process and show the attributes assigned to new items, the weighting for each, and the detailed similarity score by attribute.

Note: Oracle reserves the right to adjust future configurations for the *New Item* solution. It is recommended that any customization for *New Item* is limited to the common solution.

Data Pooling - Aggregate Causal Modeling

RDF utilizes the concept of Data Pooling to improve the level of forecasting accuracy while giving the level of granularity of promotional differentiation that users require. Data pooling allows a retailer to model promotional vehicles or offers to items and/or locations that may have little or no promotional history for a specified promotion type. RDF will use the effects from other items and locations, that have a more robust data set on a certain promotion to estimate the effect on the item/location that is being promoted. By utilizing a greater set of data to base the effects, a retailer can be more precise with their promotional modeling options to their customers while minimizing the risk of too much or too little inventory to support the promotion.

The use of data pooling is ideal for new items and items with little or poor promotional history. Additionally, controls are included to blend self-effects with pooled effects and is an important piece to promotion granularity. This blending allows retailers to consider causal types of a different offer type. For example, Buy One Get One Free or a percentage off. Types can also include the delivery vehicle, such as, using Circulars or online methods — if only one of the offer or vehicle are new to the promoted item.

New Forecasting Special Expression

Note: The Forecast special expression will be decommissioned in the next patch release. It is replaced by the Forecast150 special expression. For details on impact and upgrade, refer to the *Release15.0 Oracle Retail Demand Forecasting Configuration Guide*.

The enhanced option for overlapping promotions is decommissioned and is replaced by the data pooling approach. This new approach is proven to be faster and to deliver more accurate promotion effects estimates.

For Release 15.0, the Forecast150 special expression is introduced. Its main purpose is to support the aggregate causal modeling, but it has additional advantages over the previous special expression, Forecast:

- Usability

The new forecast special expression is more flexible. Building and maintaining rules is easier because it accepts the input parameter measures at different intersection as long as the input can be mapped to the forecast level. For instance, for an item/store/week forecast level, the new forecast expression can accept the forecast start date as scalar, at class/region or department level.

- Performance

The new special expression is coded in a new high performance I/O caching framework, which leads to better performance.

- Modularization

In 15.0, the causal effects estimation is split from forecasting. This modularization allows users to specify only the meaningful inputs for specific steps in the forecasting process. This simplifies the RPAS rules and makes them easier to write and maintain.

- Accuracy

The new forecast expression together with the new causal estimation special expression are the backbone of the Aggregated Causal Modeling approach discussed previously. This has been proven to improve the promotional forecast accuracy and robustness.

Noteworthy Defect Fixes

The following table contains issues that have been fixed for the current release.

Affected Component	Fixed Issue/Defect	Defect Number
Alerts	When calling the alert manager utility, the generate function does not pass the -navigationThreshold option to the alert manager. This issue has been addressed by adding a new environment variable, ALERTNAVIGATIONTHRESHOLD, to specify an override for the default threshold.	20617026 20866191

Affected Component	Fixed Issue/Defect	Defect Number
Automation	Running automation on a 13.4 configuration fails. This issue has been resolved.	21241781 21392707
CPEM	CPEM can only run the cannibalization batch when there are less than 500 items in the ancestor level. This issue has been addressed by increasing the number to 1000.	20949072
Curve	The Curve Profile Approval is overriding past manual adjustments. This issue has been resolved by not allowing overrides of manual adjustments.	20214232 21425768
Export Script	The exportRDFtoAPCROWeekly.ksh script does not get the correct intersection of the approved forecast measure. This issue has been resolved.	20831332
Export Script	The exportRDFtoAPCRO.ksh script does not work when the RPAS_LOG_LEVEL=information. This issue has been resolved.	20831317
Forecasting	The promotional forecast is zero when a non-significant promotion is active. This issue has been resolved by making sure the forecast is at least equal to the baseline.	21340769
Forecasting	The forecast method override option of No Forecast is not being respected. This issue has been resolved.	20915334 21343682 21343692
Forecasting	Extremely high promotional forecasts may be generated when the causal data source is not properly preprocessed. This issue has been addressed by introducing a threshold that determines which data points (larger than the threshold) are processed by the causal engine.	21135909 21340791
Forecasting	The forecast length is a setting at subdomain level. This issue has been resolved by allowing forecast length override at the time series level.	21329069
Forecasting	For the profile-based forecasting method, the shift in profile does not correspond to the sales, when the leading zeroes are removed. This issue has been resolved, by making sure the calendar dimensions of the profile and sales are aligned.	20737088 21239138 21239145
Halo	The Halo batch is failing when more than 400 classes are selected. This issue has been resolved.	21666350
Integration	Integration issues with the rdf_e_rms.ksh script. This issue has been resolved.	20761857
Integration	Issues with the rdf_e_aip_appf.ksh script and the BSA framework. This issue has been resolved.	20729084
Label	There was a discrepancy between the taskflow and the view name. Accept Negative Lift versus Accept Negative Lifts. This issue has been resolved.	21282406
Label	On the levels page of the Promo Effectiveness wizard, the label of the level does not display fully. This issue has been resolved by allowing more characters.	20418132

Affected Component	Fixed Issue/Defect	Defect Number
Label	Labels are incorrect in the Promo Effectiveness workbook. This issue has been resolved by changing a worksheet label from <i>Promotion Parameters For Level</i> to <i>Promotion Lift Overrides for Level</i> .	21091582 21297471
Performance	Preprocessing slow due to rdfpreprocessingbatch.sh.	21328870 21841934
Performance	Demand Transference effects slows down AutoES Forecast Generation.	19170705
Performance	Export to AIP script, rdf_e_aip_appf.ksh, is slow.	18432391 21329026 21828742
Performance	The script, exportrdftoapro.ksh is slow.	21033539 21828753
Performance	Performance issue in \$rpas_integration_home/rfx/etc/loadretlmeasures.ksh.	20769876
Performance	The script, rdf_e_rms.ksh is slow.	21033521
Plug-ins	The RDF rpasInstall plug-ins do not respect the -in parameter of rpasInstall. This issue has been resolved.	21834825
Preprocessing	The RDF preprocessing flow is not calculating the desired forecast data sources. This issue has been resolved, by correcting the input and output measures of the preprocessing runs.	21539791
Promotions	There are instances when no promotion lifts are generated, although promotion effects are calculated. The issue has been resolved by fixing a bug in loading the promotion calendar.	21847931 21847925 21835742 21847926
Promotions	Enhanced approach for overlapping promotion generates NANQ values in the forecast. This issue has been resolved by fixing an issue when two overlapping effects are handled multiplicatively	21779052 21779065
Promotions	The overlapping promotion adjustment factor only takes the integer part of the value. This issue has been resolved by allowing real numbers.	20544144 20645262
Promotions	Applying promotional lift override from a higher level is not working properly if the override is zero. This issue has been resolved by ensuring the override is respected.	20418294 20602931
Promotions	The promotional effects set to override were ignored in the causal forecast. This issue has been resolved by applying the override effects.	20928014 20994882
Script	The functions.ksh script included BSA commands that cause errors in one of its functions, GetSubdomainPaths, when that function is called from a non-BSA script. This issue has been resolved.	20975832

Affected Component	Fixed Issue/Defect	Defect Number
Smoothing	Negative adjustments are made to sales values when preprocessing demand using the Standard Exponential Smoothing (LS STD ES) method. This issue has been resolved by making sure the filtered result is not lower than input data when using the Lost Sales Standard Exponential Smoothing method.	20576393
Wizard	The Forecast Scorecard workbook wizard allows users to drill down lower than the dimensions of the forecast level intersection. This issue has been resolved.	19501711 20504231
Workbook	The Forecast Approval workbook cannot be built if month and week position names are the same. This issue has been resolved by modifying custom wizard code to be able to handle duplicated position names.	21426006 20347646 21425951
Workbook	In the Promotion Effectiveness workbook, a promotion cannot be overridden unless the current date is included in the workbook. This issue has been resolved by removing the limitation.	21226669
Workbook	In the Interactive Forecasting workbook, AutoES selects SimpleES as forecasting method instead of a seasonal method. This issue has been resolved by using the same forecast special expression in the workbooks and in batch.	14379406 21187244
Workbook	In the Forecast Scorecard workbook, the time phased measures are not calculated correctly when only part of the forecast horizon is included in the workbook. This issue has been resolved.	20358850 20883840
Workbook	On rebuilding the Promo Effectiveness workbook, the items previously selected in the wizard are not displayed. This issue has been resolved.	18541961
Workbook	Wrong label in the Extra Week Administration workbook wizard. This issue has been resolved by adding the label to the configuration.	19999110 20504187

Hot Fix 15.0.0.1 Available for RDF 15.0

Hot fix 15.0.0.1 is available at My Oracle Support to address some issues discovered in RDF 15.0. You must download and install this hot fix.

Access My Oracle Support at the following URL:

<https://support.oracle.com>

See the README file included with the hot fix for more information about the content of the hot fix and instructions for installing it.

Known Issues

The following table contains issues that have been identified for the current release.

Affected Component	Known Issue/Defect	Defect Number
Halo	Currently, in Halo batch, the promotion variable (pagxlcirc) that calculates the system forecast is from the previous batch. If users change the promotion indicator between the previous batch and Halo batch, then the change does not occur.	17799032
Override Option	There is no override option for the approval method in the Forecast Maintenance workbook. A workaround is provided in Bug DB.	19467391
Translation Files	There may be issues when loading translated strings into RDF.	20923721
Grade Workbooks	When navigating through the wizard selections for certain Grade workbooks, the selections are being duplicated on screen. The workbooks include Generate Grade Breakpoints and Generate Clusters.	18196485
CPEM Domain Build	When building a CPEM domain, the log may contain <code>DimAttrManagerException</code> for the measure <code>canmapsum</code> . This exception can be ignored and the newly built domain can safely be used.	22236816
RDF Domain Upgrade	After removing the dismantled <i>cloning</i> functionality, the RDF plug-in does not completely remove created measures, rules, and workbooks. This results in failure in the domain upgrade process. There is no available workaround and it is recommended to wait until the next hotfix before upgrading to Release 15.0.	22288455

Related Documentation

For more information, see the following documents in the Oracle Retail Demand Forecasting Release 15.0 documentation set:

- *Oracle Retail Demand Forecasting Configuration Guide*
- *Oracle Retail Demand Forecasting Implementation Guide*
- *Oracle Retail Demand Forecasting Installation Guide*
- *Oracle Retail Demand Forecasting Release Notes*
- *Oracle Retail Demand Forecasting User Guide for the RPAS Classic Client*
- *Oracle Retail Demand Forecasting User Guide for the RPAS Fusion Client*
- Oracle Retail Predictive Application Server documentation

The following documentation may also be needed when implementing RDF:

- *Oracle Retail Planning Batch Script Architecture Implementation Guide*

Supplemental Documentation

The following document is available through My Oracle Support at the following URL:

<https://support.oracle.com>

Oracle Retail Demand Forecasting 15.0 Cumulative Fixed Issues (Note ID 2068687.1)

This document details the fixed issues and defects for all RDF, Curve, and Grade patch releases prior to and including the current release.

Supplemental Training on My Oracle Support

The following document is available on the My Oracle Support Web site. Access My Oracle Support at the following URL:

<https://support.oracle.com>

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Value-Added Reseller (VAR) Language

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