

Oracle® Retail Demand Forecasting

Release Notes

Release 13.4

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Oracle Retail Demand Forecasting Overview

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 13.4 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 example above, 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 above) 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:
 - `updateschemafiles.ksh` script updates the dimension field length of schema files to the length as available in the domain.
 - `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*.

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 13.4 includes the following functional enhancements.

Cross Promotional Effect Module (CPEM)

New to RDF 13.4 is the ability to estimate cross promotional effects. The two types of cross effects are:

- Cannibalization
- Halo

Cannibalization cross effects happen when a promoted item causes a drop in sales of a similar item. An example of this behavior is when a brand of mustard is promoted, it likely experiences an increase in sales and other mustard brands' demand decreases.

Conversely, Halo cross effects happen when a promoted item, or group of items causes an increase in sales of a complementary item or items. A typical case is when hot dogs are promoted, hot dog buns are likely to see an increase in sales as well.

CPEM is a module within RDF, but it is implemented separately of a RDF forecasting environment. The nature of the problem that mining for cross promotional relationships poses, that is, search for relationships among items in different areas of business, is not compatible with the master/local domain structure of a typical RDF environment. CPEM is implemented in a simple domain, such that mining for Halo effects can span all areas of the business.

The cross effects are exported to RDF, and incorporated in the forecast during the Causal forecasting generation.

Nonlinear Variables

The causal forecasting algorithm is enhanced to estimate the self lift of exponential variables. Prior to 13.4 the causal model was additive and it accepted boolean and real variables. However, none of them were allowed to be continuous, that is, to be active every period in history.

To accommodate exponential variables, the causal algorithm was changed to a multiplicative model, and it now accepts boolean and exponential variables. Note that real variables are not allowed if the model is multiplicative.

This feature allows an intuitive handling of price (or price change) as a causal variable.

An additional benefit of modeling the price as an exponential variable is the fewer number of variables — because price banding is not necessary anymore, and increased accuracy of the price effect on the forecast.

Promo Effectiveness Workbook

Prior to 13.4, a user could see the effect of a promotion, and interaction among promotions.

The workbook was overhauled for 13.4, and the functionality is extended to include the following:

- Visibility to baseline forecast, self and cross promo effects, self and cross regular effects, promotion plan, lift and effect overrides.
- Ability to perform promo what-if based on the baseline forecast, self and cross promo effects, self and cross regular effects, promotion plan, lift and effect overrides.

Technical Enhancements

RDF 13.4 includes the following technical enhancements.

Batch Script Architecture (BSA)

All batch scripts that are developed and delivered as part of this application have been rewritten using the Batch Script Architecture. The Batch Script Architecture (BSA) is designed to provide a robust, enterprise-ready architecture for parallel process control, restart control, log consolidation, and dependency checks.

Functionally, the batch operability is enhanced by making it easier to diagnose and correct problems. Errors and exceptions are isolated (contained) within the domains in which they occur. Processing is designed to easily restart and proceed with execution. Parallel tasks are managed, logged, and checked for errors, to the same standard as non-parallel tasks.

Oracle Retail Batch Script Architecture Implementation Guide

The Oracle Retail Batch Script Architecture Implementation Guide is new for this release. It documents the features and configuration details for implementing the Batch Script Architecture.

Domain Build Scripts

The RDF domain build/patch process has changed significantly for this release and all previous domain build/patch scripts are obsolete. New to this release of RDF is `buildRDF.sh`, which should be used to modify your domain build/patch script.

The script, `buildRDF.sh`, is used to create or patch an RDF domain by calling `execPluginTask.sh`, `rpasInstall`, and `loadRDFMeasures.sh`. Just like other RDF related scripts, `buildRDF.sh` and `loadRDFMeasures.sh` are located under the folder of `$RDF_HOME/bin`. Before running `buildRDF.sh`, ensure `$RDF_HOME` is correctly setup and `$RDF_HOME/bin` is in the `$PATH`.

Use the following procedure to create or patch an RDF domain. For additional information, refer to the *Oracle Retail Demand Forecasting Installation Guide*.

Procedure

To build a RDF domain, run the following command:

```
buildRDF.sh -c <config path> -i <input path> -l <log path>  
-d <domain path>[-m <max process#>] [-f: <log file>]
```

To patch a RDF domain, run the following command:

```
buildRDF.sh -c <config path> -i <input path> -l <log path>  
-d <domain path>[-m <max process#>] [-f: <log file>] -p
```

Where:	Is the Path for the:
<config path>	configurations
<input path>	input files
<log path>	log file name
<domain path>	domain
<max process#>	number of maxprocess

Notes:

The flag `-p` must be used for domain patching.

The flag `-m` is optional and if it is not used, then 1 is the default value for number of processes.

The flag `-f` is optional and if it is not used, then the `build_domain.log` is the default log file name for `rpasInstall`.

Fixed Issues/Defects

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

Defect Number	Product	Fixed Issue/Defect
NA	RDF	<p>There was an issue with the generally available (GA) configuration of pre-13.4 versions of RDF. An empty workbook tab exists that does not perform a function in the forecast scorecard workbook. This tab is not deleted by the plugin regeneration because it does not exist in the master template. It is thus considered a customization.</p> <p>The new taskflow generation code in 13.4.0 also creates a task for it. The empty workbook tab in the forecast scorecard workbook has been removed from the 13.4 GA configuration.</p> <p>For information on how to remove the empty workbook tab as part of your RDF upgrade process, see the 13.4 <i>Oracle Retail Demand Forecasting Installation Guide</i> and <i>Oracle Retail Demand Forecasting Configuration Guide</i>.</p>
14792949	RDF	<p>The <code>PreGenerateForecast</code> registers measures with incorrect NA (not applicable) values.</p> <p>This issue has been corrected.</p>

Defect Number	Product	Fixed Issue/Defect
14776452	RDF	Measure labels with special characters that are included in picklists, cause commit failures in the Forecast Approval workbook. This issue has been corrected by replacing the special characters with blank spaces when the measures are a picklist option.
14407550	RDF	RDF automation wipes out everything that is in the taskflow file. This issue has been corrected.
14002261	RDF	RDF automation sequence does not complete from a domain upgraded from 13.2 to 13.3. This issue has been corrected.
13982370	RDF	RDF scripts continue to run even after an internal error occurs. This issue has been corrected by better error checking and proper return codes.
13898685	RDF	In the preprocessing window, when the first period and the periods immediately before it have the event flag set to <i>True</i> , preprocessing does not count those periods in the history window as consecutive events and RDF does not compute the adjustment correctly. This issue has been corrected, by changing the algorithm to include those events in the preprocessing window.
14394470	Curve	The Curve plug-in execution throws exception because adding an edited measure causes duplication. This issue has been corrected.

Known Issues

The following table contains known issues for the current release.

Defect Number	Product	Known Issue/Defect
14672225	RDF	On some UNIX systems, there is a script error that stops the execution of the RMS RETL transform when date ranges are specified.

Related Documentation

For more information, see the following documents in the Oracle Retail Demand Forecasting 13.4 documentation set:

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

Previous Releases

For additional information on previous Oracle Retail Demand Forecasting release enhancements and additional information, refer to the release notes and documentation that accompany the previous release.

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