

Oracle® Retail Replenishment Optimization
Implementation Guide
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Primary Author: Melissa Artley

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Oracle Retail Replenishment Optimization Implementation Guide, 13.4.3.

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Preface

The *Oracle Retail Replenishment Optimization Implementation Guide* describes post-installation tasks that need to be performed in order to bring Replenishment Optimization online and ready for production use.

Audience

This Implementation Guide is intended for the Replenishment Optimization application integrators and implementation staff, as well as the retailer's IT personnel. This guide is also intended for business analysts who are looking for information about processes and interfaces to validate the support for business scenarios within Replenishment Optimization and other systems across the enterprise.

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Related Documents

For more information, see the following documents in the Oracle Retail Replenishment Optimization Release 13.4.3 documentation set:

- *Oracle Retail Replenishment Optimization Implementation Guide*
- *Oracle Retail Replenishment Optimization Installation Guide*
- *Oracle Retail Replenishment Optimization Release Notes*
- Oracle Retail Predictive Application Server documentation

The following documentation may also be needed when implementing RO:

- *Oracle Retail Planning Batch Script Architecture Implementation Guide*

For more information about RPAS and the ODI Enabled Integration, see the following documentation sets:

- Oracle Retail Enabled ODI Integration documentation

- Oracle Data Integrator documentation
- Oracle Retail Predictive Application Server documentation

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- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to recreate
- Exact error message received
- Screen shots of each step you take

Review Patch Documentation

When you install the application for the first time, you install either a base release (for example, 14.0) or a later patch release (for example, 14.1.1). If you are installing the base release, additional patch, and bundled hot fix releases, read the documentation for all releases that have occurred since the base release before you begin installation. Documentation for patch and bundled hot fix releases can contain critical information related to the base release, as well as information about code changes since the base release.

Oracle Retail Documentation on the Oracle Technology Network

Documentation is packaged with each Oracle Retail product release. Oracle Retail product documentation is also available on the following Web site:

http://www.oracle.com/technology/documentation/oracle_retail.html

(Data Model documents are not available through Oracle Technology Network. These documents are packaged with released code, or you can obtain them through My Oracle Support.)

Documentation should be available on this Web site within a month after a product release.

Conventions

The following text conventions are used in this document:

| Convention | Meaning |
|-----------------|--|
| boldface | Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary. |
| <i>italic</i> | Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values. |
| monospace | Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter. |

Introduction

The primary goal of Replenishment Optimization (RO) is to harness the replenishment methods available in the client's replenishment system. To make the best use of the available replenishment capabilities, RO recommends optimized replenishment parameters at the SKU/location level. The recommendations take into account sales volume, volatility, availability of forecast data, seasonality, client business rules and constraints, and financial objectives to determine the optimized values.

RO automatically monitors item/location demand and supply chain variables to determine the optimal inventory for the greatest return. It recommends replenishment settings, either automatically approving the changes or raising alerts; for example, alerting higher impact items. The optimal replenishment settings recommended by Oracle Retail Replenishment Optimization may be used to update Oracle Retail Advanced Inventory Planning (AIP) replenishment parameters or the retailer's legacy replenishment system. For a more detailed overview of the functionality within RO, see the *Oracle Retail Replenishment Optimization User Guide for the RPAS Classic Client* and *Oracle Retail Replenishment Optimization User Guide for the RPAS Fusion Client*.

Contents of This Guide

This implementation guide addresses the following topics:

- [Chapter 1, "Introduction"](#): Overview of the RO business workflow and skills needed for implementation.
- [Chapter 2, "Implementation Considerations"](#): Explanation of the factors to take into consideration before performing the implementation.
- [Chapter 3, "Build Scripts"](#): Information on building and patching the RO domain.
- [Chapter 4, "Integration"](#): Overview of the Integrated Inventory Planning Suite integration, a detailed review of the Analytic Parameter Calculator for Replenishment Optimization (APC RO) integration, and integration configuration.
- [Chapter 5, "Configuration Considerations"](#): Information on the functional changes or enhancements that can be made for RO.
- [Chapter 6, "Configuring the RO Solution"](#): Information on the RO plug-in that is available for automating the steps required for configuration.
- [Chapter 7, "Batch Processing"](#): Explanation of batch scheduling and batch designs.
- [Chapter 8, "Internationalization"](#): Translations provided for RO.

RO and the Oracle Retail Enterprise

Figure 1–1 shows the architecture of RO and the Oracle Retail Predictive Application Server (RPAS).

Figure 1–1 RO and the Oracle Retail Enterprise

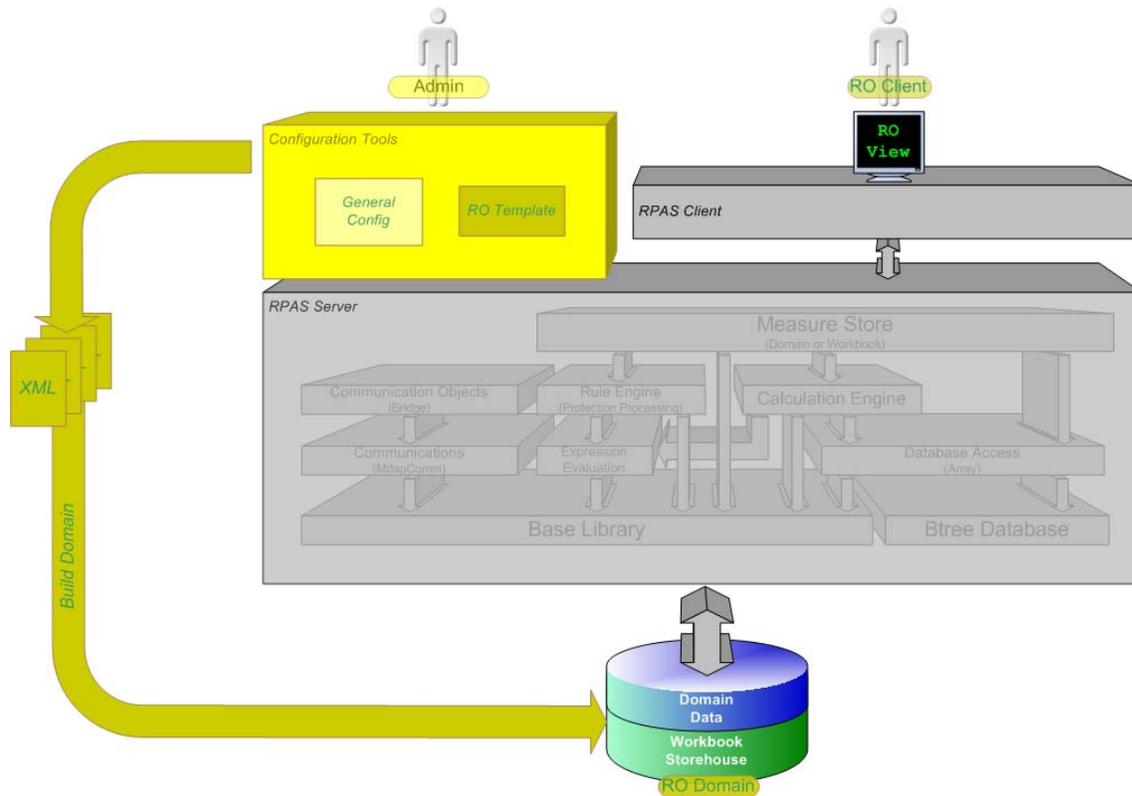


Figure 1–1 describes the RO template application. In the truest sense, RO and other templates are not applications in the same way that the RPAS client is an application, as end users are not presented a user interface specific to the template. The RO and other templates are the predefined means to view specific types of data in the domain such that the RPAS client user interface is used to read from and write to the domain.

The system administrator responsible for maintaining the RPAS Configuration Tools ensures that the appropriate templates are available. Each template has the following associated information to define its predefined attributes:

- Measures
- Special expressions
- Rules
- Workbook layout

A client requests for the use of one of the templates by using the Configuration Tools. A number of XML files are then output, which define the domain to be created. These XML files are used to build the specified domain, incorporating all the attributes mentioned above that have been defined specifically.

Once the domain has been created, the end user can access the domain data through the RPAS client.

Business Process Workflows

This section describes the business process workflows needed to execute and maintain the RO environment.

For additional information about RO batch scripts, refer to [Chapter 7, "Batch Processing"](#).

APC RO Data Load Process

APC RO provides numerous measure data files to RO. These hierarchy files can be generated using the APC RO measure data files.

For additional information on the APC RO Data Load process, see "[APC RO Data Load Process](#)".

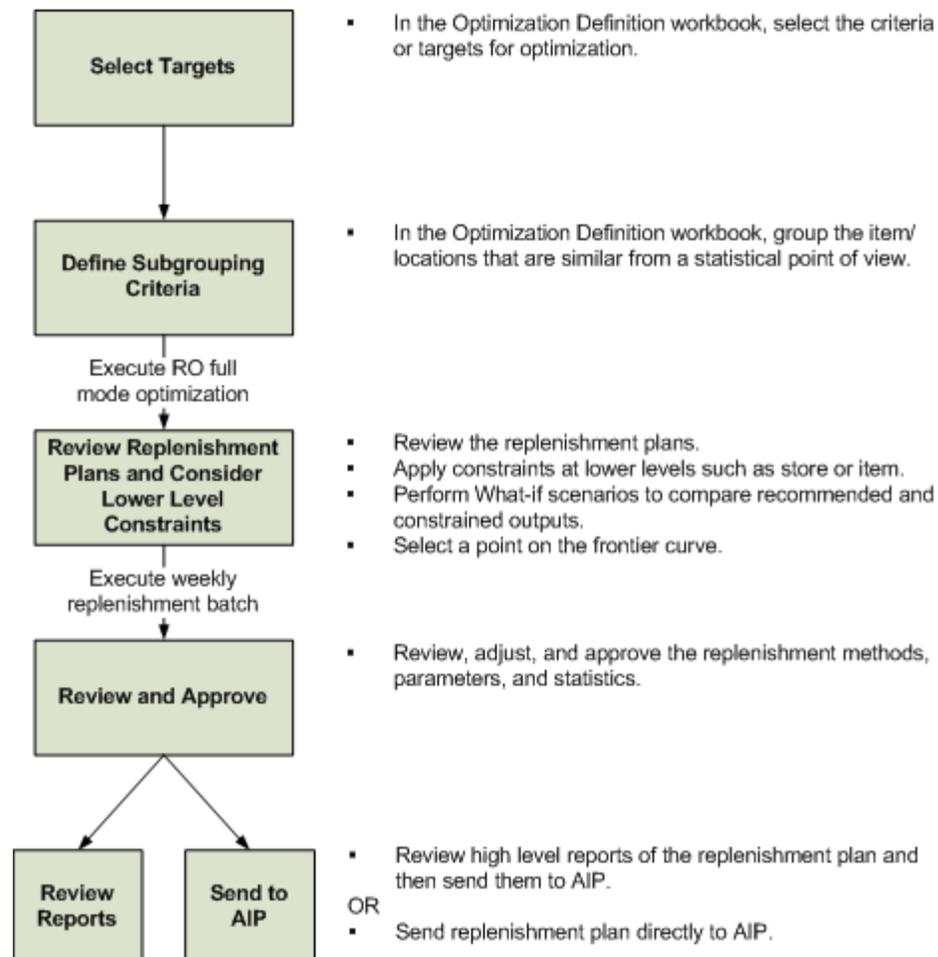
Full Mode Optimization

When RO is first implemented, it is expected that full mode optimization and replenishment are run for every optimization partition.

The full mode optimization can be run quarterly.

[Figure 1–2](#) shows the workflow for the full mode batch of RO.

Figure 1–2 Full Mode Optimization Batch Process Workflow



Full Mode Optimization Process Steps

Following the steps below, perform full mode optimization when RO is first configured or when a major change to the replenishment plan is necessary.

1. Create the Optimization Definition workbook.

| Action | Description |
|--------|--|
| A | Set the optimization mode to full mode for everything. |
| B | Set subgroup criteria. |
| C | Set optimization parameters. |
| D | Commit the changes to domain. |

2. Run the optimization batch.

| For... | Script Name |
|------------------------|---------------------|
| Store optimization | ro_optbatch_str.ksh |
| Warehouse optimization | ro_optbatch_wh.ksh |

3. Create the Optimization Review workbook. Review the optimization batch results and select the targeted point along the inventory cost trade-off curve. Approve the user-selected replenishment scenarios.
4. Run the replenishment batch process using the approved scenario.

| For... | Script Name |
|------------------------|----------------------|
| Store optimization | ro_replbatch_str.ksh |
| Warehouse optimization | ro_replbatch_wh.ksh |

5. Open the replenishment workbooks, review results from replenishment batch process, and approve the system recommended settings.

Note: If you do not approve of the results from the system recommended settings, you can input user override, perform what-if analysis, and approve the override settings.

6. Run the report batch so that the results are viewable from OBIEE.

| For... | Script Name |
|------------------------|------------------------|
| Store optimization | ro_reportbatch_str.ksh |
| Warehouse optimization | ro_reportbatch_wh.ksh |

7. Export to AIP.

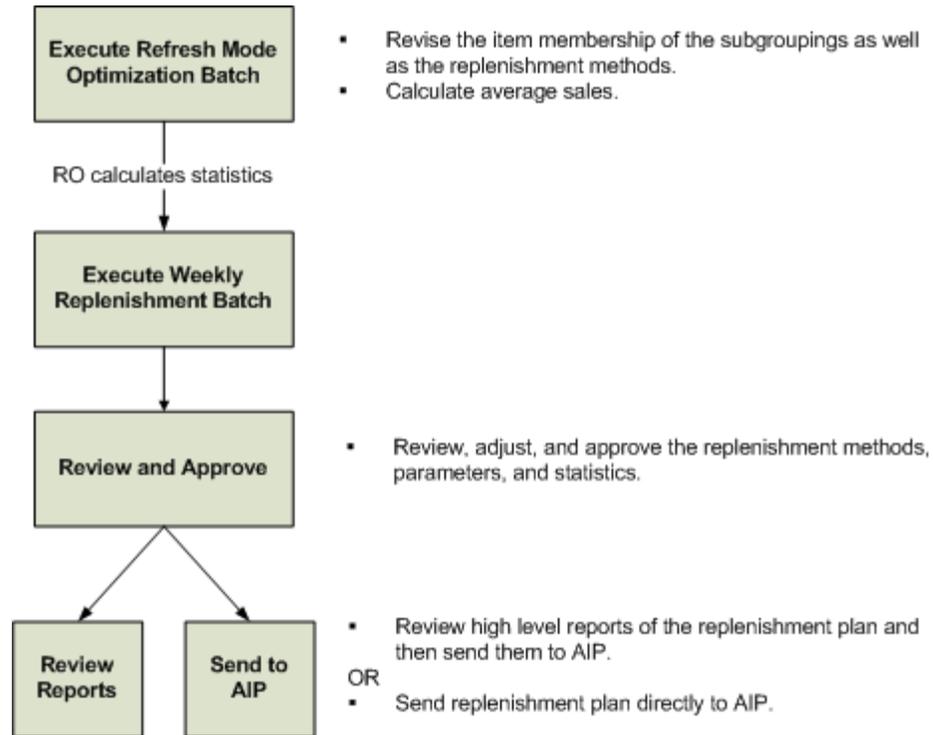
| For... | Script Name |
|------------------------|------------------------|
| Store optimization | ro_export_to_aip.sh |
| Warehouse optimization | ro_export_to_aip_wh.sh |

Refresh Mode Batch Optimization

Run refresh mode batch optimization to maintain the RO environment. Refresh mode batch optimization can be run weekly.

Figure 1-3 shows the workflow for the weekly refresh mode batch of RO.

Figure 1-3 Refresh Batch Optimization Process Workflow



Refresh Mode Batch Optimization Process Steps

Following the steps below, perform refresh mode batch optimization to maintain the RO environment.

1. Create an Optimization Definition workbook.

| Action | Description |
|--------|--|
| A | Set the optimization mode to refresh mode. |
| B | Commit the changes to the domain |

2. Run the optimization batch.

| For... | Script Name |
|------------------------|---------------------|
| Store optimization | ro_optbatch_str.ksh |
| Warehouse optimization | ro_optbatch_wh.ksh |

3. Run the replenishment batch process using the approved scenario.

| For... | Script Name |
|------------------------|----------------------|
| Store optimization | ro_replbatch_str.ksh |
| Warehouse optimization | ro_replbatch_wh.ksh |

- Open the replenishment workbooks, review the results from the replenishment batch process, and approve the system recommended settings.

Note: If you do not approve of the results from the system recommended settings, you can input user override, perform what-if analysis, and approve override settings.

- Run the report batch so the results are viewable from OBIEE.

| For... | Script Name |
|------------------------|------------------------|
| Store optimization | ro_reportbatch_str.ksh |
| Warehouse optimization | ro_reportbatch_wh.ksh |

- Export to AIP.

| For... | Script Name |
|------------------------|------------------------|
| Store optimization | ro_export_to_aip.sh |
| Warehouse optimization | ro_export_to_aip_wh.sh |

Skills Needed for Implementation

The implementer needs an understanding of the following applications and technical concepts.

Applications

The implementer should understand the interface requirements of the integrated applications and data sources for the master data, demand, and inventory history. For the Integrated Inventory Planning Suite, the implementer needs this knowledge for the following applications:

- Oracle Retail Analytic Parameter Calculator Replenishment Optimization
- Oracle Retail Advanced Inventory Planning
- Oracle Retail Demand Forecasting

Technical Concepts

The implementer should understand the following technical concepts:

- UNIX system administration, shell scripts, and job scheduling
- Performance constraints based on the retailer's infrastructure
- Technical architecture for RO
- Retailer's hierarchical (SKU/store/day) data

- RO batch processes
- How to set up an RPAS domain
- RPAS configuration and how to use the RPAS Configuration Tools
- Understanding of how Fusion Client works
- Working of RPAS rule language
- Measures and dimension constructs
- Basic merchandising
- Basic forecasting

Implementation Considerations

The following information needs to be considered before implementing RO:

- [Historical Data](#)
- [Domain Partitioning](#)
- [Formatting](#)
- [Plug-ins](#)
- [Patch Considerations](#)
- [Batch Scheduling](#)
- [Security](#)
- [Internationalization](#)

Historical Data

It is recommended that you have at least two years of historical sales and inventory data for creating replenishment optimization plans. Less data can be used; but the more data that is available, the more statistical significance can be given to Replenishment Optimization.

When introducing new items, it is always the case that the historical data is - at best - very short. To avoid making recommendations for items with only a few data points, the cloning functionality available in RPAS can be used to clone the historical data of a well established like item into the history of a new item.

Finally, it is generally beneficial that the historical data is filtered for outliers or promotional lifts before it is included in the optimization. This can be achieved by using the data preprocessing capabilities available in RPAS.

Domain Partitioning

Partitioning is done to avoid contention for resources. Building a workbook and committing data are two processes that can cause contention.

How data is partitioned has an impact on the business process. The RO domain is defined as a global domain. For performance reasons, a simple domain is not recommended. There should be an even distribution of users across a set of local domains. For example, separate domains for men's merchandise, women's merchandise, and children's merchandise. When a user is committing data in the men's merchandise domain, this will not affect the users in the women's or children's domain because of the use of partitioning.

Consider the following questions when defining the partitioning of the domain:

- How do I partition to meet my business needs?
- How do I partition my users?
- How do I create groups of users to further partition the solution?

Domain partitioning is supported on any dimension of the Product (PROD) hierarchy and any dimension of the Location (LOC) hierarchy if the optimization level is below partition. These hierarchies are standard RPAS hierarchies.

Note: The partitioning level in the RO configuration is PGRP, which is labeled Group. It is recommended that this not be changed.

In the base configuration, Group is a dimension label. The group dimension is a regular dimension in the product hierarchy, which the customer can rename or delete. One of the major purposes of partitioning in RO is to facilitate the parallelization of the batch process.

Formatting

Formatting can be done in the configuration or the workbook after the domain is built.

- An implementer can create generic styles for the measures and assign them to measure components or realized measures. For each measure, these styles can be overridden on each workbook template. Formatting can only be changed by using the RPAS Configuration Tools. For more information, see the *Oracle Retail Predictive Application Server Configuration Tools User Guide*.
- Once the domain is built, the implementer can set up worksheet sizes and placements, exception value formatting, gridlines, and other formatting. The implementer instantiates a workbook of the template to set up specific formatting by using the Format menu. The updated format is then saved to the template so that it is available to all users for any newly created workbooks. For information on how to use the Format menu, see the *Oracle Retail Predictive Application Server User Guide for the RPAS Classic Client* and *Oracle Retail Predictive Application Server User Guide for the RPAS Fusion Client*.

Plug-ins

Plug-ins are application-specific Java code modules that run inside and automate the RPAS Configuration Tools to assist the implementer with specific application configuration. There are rules that an implementer must follow when configuring an application. A plug-in makes such adherence easier by automating parts of the configuration process and validity-checking entries that are made.

An RO plug-in is available for automating the steps required for configuration. For information on the RO plug-in, see [Chapter 6, "Configuring the RO Solution"](#).

Patch Considerations

With a new release, there are two types of patches that can affect the RO domain:

- Changes to the code in the RPAS libraries

The configuration is not affected by this type of patch. For these types of changes, applying the patch is a straightforward process.

- Changes to the configuration

These types of changes can be more complex. If you have customizations in the configuration, you can use the `rpasConfigMgr` utility to determine the differences between your existing configuration and the new one. Then, you can use the utility to merge the two configurations. Any changes that cannot be applied are written to a change log. For more information, see the *RPAS Configuration Tools User Guide*.

Batch Scheduling

Batch scripts are lists of commands or jobs executed without human intervention. A batch window is the time frame in which the batch process must run. It is the upper limit on how long the batch can take. Batch scripts are used for importing and exporting data and for generating size profiles. The retailer needs to decide the best time for running batch scripts within the available batch window.

The retailer should also determine how often the sales and inventory data needs to be uploaded.

Security

To define workbook template security, the system administrator grants individual users, or user groups, access to specific workbook templates. Granting access to workbook templates provides users the ability to create, modify, save, and commit workbooks for the assigned workbook templates. Users are typically assigned to groups based on their user application (or solution) role. Users in the same group can be given access to workbook templates that belong to that group alone. Users can be assigned to more than one group and granted workbook template access without belonging to the user group that typically uses a specific workbook template. Workbook access is either denied, read-only, or full access. Read-only access allows a user to create a workbook for the template, but the user can not edit any values or commit the workbook. The read-only workbook can be refreshed.

When users save a workbook, they assign one of three access permissions to the workbook:

- World — Allow any user to open and edit the workbook.
- Group — Allow only those users in the same group to open and edit the workbooks.
- User — Allow no other users to open and edit the workbook.

Note: A user must have access to the workbook template in order to access the workbook, even if the workbook has World access rights.

For more information on security, see the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* and *Oracle Retail Predictive Application Server Administration Guide for the Fusion client*.

Internationalization

For more information on translation for RO, see [Chapter 8, "Internationalization"](#).

Build Scripts

This chapter describes the set up that must be done before building the RO domain and the batch scripts that must be executed to build the domain.

Installation Dependencies

RPAS and RO must be installed before setting up and configuring RO.

- For information on installing RPAS, see the *Oracle Retail Predictive Application Server Installation Guide*.
- For information on installing RO, see the *Oracle Retail Replenishment Optimization Installation Guide*.

Environment Setup

Before downloading the installation package to the UNIX server, a central directory structure to support the environment needs to be created. This central directory is referred to in this document as `<ro_directory>`. The UNIX user performing the installation must set up an environment variable called `RO_HOME` in the user's profile:

```
export RO_HOME=<full path name to RO home>
```

RPAS Installation

The Java-based RPAS installation programs that are included with the installation package are used to install the server-side RPAS components on UNIX operating systems.

The RPAS installer performs the following functions:

- Installs the RPAS server
- Installs the Configuration Tools on the server
 - On Windows, an InstallShield package is used to install the Configuration Tools.
- Defines the DomainDaemon port

RPAS Client Installation

The RPAS server installation package also includes the following RPAS clients:

- RPAS Classic Client: A Windows-based client interface for end users and system administrators of an RPAS domain.

- **RPAS Fusion Client:** A Web-based client developed using Oracle Application Development Framework (ADF).

Each RPAS client installation package includes a separate installer to help you install the client. For more information on installing the RPAS clients, refer to the Oracle Retail Predictive Application Server Installation Guide.

RO Installation

In addition to the RPAS installer, the installation package also includes the Java-based RPAS installation program for the RO application.

The RO installer performs the following functions:

- Downloads the configuration and batch scripts into the `<ro_directory>/Config` and `<ro_directory>/bin` directories.
- Downloads a set of sample hierarchy and data files into the `<ro_directory>/TestInputNT` directory.
- Builds a sample domain at one of these locations:

| Path | Use |
|---|---------------------------|
| <code><ro_directory>/domain/RO_CCIO</code> | Store Level RO Domain |
| <code><ro_directory>/domain/RO_Warehouse</code> | Warehouse Level RO Domain |
| <code><ro_directory>/domain/RO_NTIER</code> | Multi-tier RO Domain |

Custom Domain Build

To do a custom build of a domain:

1. Update the `globaldomainconfig.xml` file with the correct domain paths.
2. If needed, update the default environment variables in `ro_environment.sh`.
3. Execute the `buildRO.sh` script:

```
./buildRO.sh
```

The first time `buildRO.sh` is executed, an error may occur when it tries to remove the old log file because a log file does not yet exist.

Environment Variables

In addition to the regular RPAS environment variables, including `RPAS_HOME`, you must set up the following environment variables and export them:

- **RPAS_JAVA_CLASSPATH**

This is the path to the RO JAVA libraries. It should appear as follows:
`$RPAS_HOME/applib/aaiReplenOpt.jar:$RPAS_HOME/applib/aaijni.jar`

Note: For Windows platforms, use a semicolon instead of a semicolon in `RPAS_JAVA_CLASSPATH`.

- **RIDE_HOME**

This is the full directory path to where the RPAS Configuration Tools are installed.

- **RO_HOME**

This is the central directory structure to support the environment.

- **RO_DOMAIN**

This is the full directory path of your domain.

- **PATH**

Include \$RPAS_HOME/bin, \$RO_HOME/bin, and \$RIDE_HOME/bin in the path.

- **JAVA_HOME**

This is the location of the Java directory.

- **LD_LIBRARY_PATH**

This is valid for the Oracle Solaris and Linux platforms.

| For... | Path |
|----------------|--|
| Oracle Solaris | LD_LIBRARY_PATH=\$JAVA_HOME/jre/lib/sparc/client:\$LD_LIBRARY_PATH |
| Linux | LD_LIBRARY_PATH=\$JAVA_HOME/jre/bin:\$JAVA_HOME/jre/lib/amd64/server:\$LD_LIBRARY_PATH |

- **LIBPATH**

This is valid only for the AIX machine.

| For... | Path |
|---------|--|
| AIX 5.3 | LIBPATH=\$JAVA_HOME/jre/bin:\$JAVA_HOME/jre/bin/j9vm:\$LIBPATH |
| AIX 6.1 | LIBPATH=\$JAVA_HOME/jre/bin:\$JAVA_HOME/jre/bin/classic:\$JAVA_HOME/jre/bin/j9vm:\$LIBPATH |

- **SHLIB_PATH**

This is valid only for HP-UX.

SHLIB_PATH=\$JAVA_HOME/jre/lib/IA64W/server:/opt/aCC/lib:\$SHLIB_PATH

- **PATH**

This is necessary for every platform. But on NT, there no environment variable for the library load path. Instead, the contents related to library path need to be included in PATH.

PATH=\$RPAS_HOME/lib;\$RPAS_HOME/applib;\$RIDE_HOME/lib; \$JAVA_HOME/bin;\$JAVA_HOME/lib:\$JAVA_HOME/bin/client:\$PATH

Files Needed to Build the RO Domain

Before the domain is built, the following types of files need to be set up:

- Standard RPAS hierarchy files
- RO-specific hierarchy files
- Data files

Standard RPAS Hierarchy Files

The following hierarchy files are needed:

- [Calendar \(CLND\) Hierarchy File](#)
- [Product \(PROD\) Hierarchy File](#)
- [Location \(LOC\) Hierarchy File](#)
- [Warehouse \(WHS\) Hierarchy File](#)

Note: As with all standard RPAS hierarchies, these hierarchies are configurable. For information about configuring these hierarchies, see [Chapter 5, "Configuration Considerations"](#).

Calendar (CLND) Hierarchy File

File name: clnd.csv.dat

File format: comma-separated values file

[Table 3–1](#) describes the fields in the file:

Table 3–1 *Calendar Hierarchy Fields*

| Field | Description |
|------------|--------------------------|
| DAY | Day ID |
| DAY label | Day label |
| WEEK | Week ID |
| WEEK label | Week label |
| MNTH | Fiscal Month ID |
| MNTH label | Fiscal Month label |
| QRTR | Fiscal Quarter ID |
| QRTR label | Fiscal Quarter label |
| SSN | Fiscal half ID |
| SSN label | Fiscal half label |
| YEAR | Fiscal Year ID |
| YEAR label | Fiscal Year label |
| DOW | Day of the Week ID |
| DOW label | Day of the Week label |
| DOS | Day of the Season ID |
| DOS label | Day of the Season label |
| WOY | Week of the Year ID |
| WOY label | Week of the Year label |
| WOS | Week of the Season ID |
| WOS label | Week of the Season label |

Example:

20091230,12/30/2009,W53_2009,1/1/2010,DEC_2009,December, FY 2009,Q4_2009,Quarter 4, FY 2009,S4_2009,Season 4, FY 2009,A2009,FY2009,WED,Wednesday,DOS96,DOS 96,WY53,Week 53,WS14,WOS 14

Product (PROD) Hierarchy File

File name: prod.csv.dat

File format: comma-separated values file

Table 3–2 describes the fields in the file:

Table 3–2 Product Hierarchy Fields

| Field | Description |
|------------|--------------------------|
| ITEM | SKU ID |
| ITEM label | SKU label |
| ITPT | Item Parent ID |
| ITPT label | Item Parent label |
| ITGR | Item Group ID |
| ITGR label | Item Group label |
| SCLS | Subclass ID |
| SCLS label | Subclass label |
| CLSS | Class ID |
| CLSS label | Class label |
| DEPT | Department ID |
| DEPT label | Department label |
| PGRP | Group ID |
| PGRP label | Group label |
| DVSN | Division ID |
| DVSN label | Division label |
| SPLR | Supplier ID |
| SPLR label | Supplier label |
| PTD1 | Parent Diff1 ID |
| PTD1 label | Parent Diff1 label |
| GPD1 | Grand Parent Diff1 ID |
| GPD1 label | Grand Parent Diff1 label |
| SCD1 | Subclass Diff1 ID |
| SCD1 label | Subclass Diff1 label |
| CLD1 | Class Diff1 ID |
| CLD1 label | Class Diff1 label |
| DPD1 | Department Diff1 ID |
| DPD1 label | Department Diff1 label |
| DIF1 | Diff1 ID |
| DIF1 label | Diff1 label |

Example:

```
10772144,LIP COLOR- 31RED:31RED:NONE,10772143,LIP COLOR-
31RED,10182143,LIP COLOR- 31RED,310,STODA,310,STODA,310,STODA,4500,Group
5,1,All Product,543213759,NORDELL,10182143,LIP COLOR- 31RED,10182143,LIP
COLOR- 31RED,310,STODA,310,STODA,310,STODA,_sml,Small

10184464,LIP ROUGE- 01PUCKER:01PUCKER:NONE,10184463,LIP ROUGE-
01PUCKER,10182163,LIP ROUGE-
01PUCKER,310,STODA,310,STODA,310,STODA,4500,Group 5,1,All
Product,553213760,NORDELL,10182163,LIP ROUGE- 01PUCKER,10182163,LIP ROUGE-
01PUCKER,310,STODA,310,STODA,310,STODA,_sml,Small
```

Location (LOC) Hierarchy File**File name:** loc.csv.dat**File format:** comma-separated values file

Table 3–3 describes the fields in the file:

Table 3–3 Location Hierarchy Fields

| Field | Description |
|------------|--------------------|
| STR | Store ID |
| STR label | Store label |
| DSTR | District ID |
| DSTR label | District label |
| REGN | Region ID |
| REGN label | Region label |
| AREA | Area ID |
| AREA label | Area label |
| CHN | Chain ID |
| CHN label | Chain label |
| CMPN | Company ID |
| CMPN label | Company label |
| SFMT | Store format ID |
| SFMT label | Store Format label |
| STCL | Store class ID |
| STCL label | Store class label |

Example:

```
769,store number 769,769,store number 769,3,region number 3,3,region
number 3,3,region number 3,200,Company 1,0,0,A,A

771,store number 771,771,store number 771,3,region number 3,3,region
number 3,3,region number 3,200,Company 1,0,0,A,A
```

Warehouse (WHS) Hierarchy File**File name:** whs.csv.dat**File format:** comma-separated values file

Table 3–4 describes the fields in the file:

Table 3–4 Warehouse Hierarchy Fields

| Field | Description |
|------------|-----------------------|
| WRHS | Warehouse ID |
| WRHS label | Warehouse label |
| WHGP | Warehouse Group |
| WHGP label | Warehouse Group label |

Example:

east, east warehouse
west, west warehouse

RO Hierarchy Files

The following are the required hierarchy files needed for RO:

- [Subgroup Hierarchy File](#)
- [Store APC Group Hierarchy File](#)
- [Warehouse APC Group Hierarchy File](#)
- [Store Scenario Hierarchy File](#)
- [Warehouse Scenario Hierarchy File](#)
- [Frontier Data Point Hierarchy File](#)
- [Break Point Hierarchy File](#)
- [KEK Hierarchy File](#)
- [PI Hierarchy File](#)

Subgroup Hierarchy File

For a description of this hierarchy structure, see [Subgroup Hierarchy File](#).

File name: subg.csv.dat

File format: comma-separated values file

Table 3–5 describes the fields in the file:

Table 3–5 Subgroup Hierarchy Fields

| Field | Description |
|------------|----------------|
| SGRP | Subgroup ID |
| SGRP label | Subgroup label |

Example:

48, subgroup 48
49, subgroup 49

Store APC Group Hierarchy File

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

File name: apcg.csv.dat

File format: comma-separated values file

[Table 3–6](#) describes the fields in the file:

Table 3–6 Store APC Group Hierarchy Fields

| Field | Description |
|------------|-----------------|
| AGRP | APC Group ID |
| AGRP label | APC Group label |

Example:

```
48, store APC group 48
```

```
49, store APC group 49
```

Warehouse APC Group Hierarchy File

This hierarchy file is generated from APC RO data files. For a description of the file generation, see ["APC RO Data Load Process"](#) on page 4-5.

File name: wapg.csv.dat

File format: comma-separated values file

[Table 3–7](#) describes the fields in the file:

Table 3–7 Warehouse Group Hierarchy Fields

| Field | Description |
|------------|-----------------------|
| WAGP | Warehouse Group ID |
| WAGP label | Warehouse Group label |

Example:

```
48, warehouse APC group 48
```

```
49, warehouse APC group 49
```

Store Scenario Hierarchy File

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

File name: scn.csv.dat

File format: comma-separated values file

[Table 3–8](#) describes the fields in the file:

Table 3–8 Store Scenario Hierarchy Fields

| Field | Description |
|------------|----------------|
| SCNO | Scenario ID |
| SCNO label | Scenario label |

Example:

48, store scenario 48

49, store scenario 49

Warehouse Scenario Hierarchy File

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

File name: wscn.csv.dat

File format: comma-separated values file

[Table 3–9](#) describes the fields in the file:

Table 3–9 Warehouse Scenario Hierarchy Fields

| Field | Description |
|------------|--------------------------|
| WSNO | Warehouse Scenario ID |
| WSNO label | Warehouse Scenario label |

Example:

48, warehouse scenario 48

49, warehouse scenario 49

Frontier Data Point Hierarchy File

For a description of this hierarchy structure, see [Frontier Data Point Hierarchy File](#).

File name: fcdp.csv.dat

File format: comma-separated values file

[Table 3–10](#) describes the fields in the file:

Table 3–10 Frontier Data Point Hierarchy Fields

| Field | Description |
|------------|---------------------------|
| FCPT | Frontier data point ID |
| FCPT label | Frontier data point label |

Example:

00198,points 00198

00199,points 00199

Break Point Hierarchy File

For a description of this hierarchy structure, see [Break Point Hierarchy File](#).

File name: brkp.csv.dat

File format: comma-separated values file

[Table 3–11](#) describes the fields in the file:

Table 3–11 Break Point Hierarchy Fields

| Field | Description |
|------------|-------------------|
| BKPT | Break point ID |
| BKPT label | Break point label |

Example:

08, break point 8

09, break point 9

KEK Hierarchy File

For a description of this hierarchy structure, see [KEK Hierarchy File](#).

File name: kek.dat

File format: comma-separated values file

[Table 3–12](#) describes the fields in the file:

Table 3–12 KEK Hierarchy Fields

| Field | Description |
|----------|-------------|
| EW | KEK ID |
| EW label | KEK label |

Example:

204, e_204

PI Hierarchy File

For a description of this hierarchy structure, see [PI Hierarchy File](#).

File name: pi.dat

File format: comma-separated values file

[Table 3–13](#) describes the fields in the file:

Table 3–13 Demand Group Hierarchy Fields

| Field | Description |
|-----------|-------------|
| PIK | PI ID |
| PIK label | PI label |

Example:

pi098, pi_98

pi099, pi_99

Required Data Files for Store Optimization

The following data files are required for store optimization:

Measures from a Merchandising or Replenishment System for Store Optimization

Note: All measures are in comma-separated values file format.

Table 3–14 Measures for Store Optimization

| Name | Filename | Required/Optional | Example |
|-------------------------------------|-------------------------|-------------------|-----------------------------|
| Item/store/week | | | |
| Weekly sales: actual sales at store | actsalsr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Weekly sales: cloned sales at store | clonesalsr.csv.ovr | Optional | 20091231,769,10772144,50.00 |
| Weekly on hand inventory | wklyinv_ohusr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Weekly on order inventory | wklyinv_ousr.csv.ovr | Optional | 20091231,769,10772144,60.00 |
| Weekly order unit | wklyorderusr.csv.ovr | Optional | 20091231,769,10772144,45.00 |
| Weekly lost sales units | wklylostslsusr.csv.ovr | Optional | 20091231,769,10772144,10.00 |
| Item/store | | | |
| Price | gpricesr.csv.ovr | Required | 769,10772144,29.99 |
| Cost | gcostsr.csv.ovr | Required | 769,10772144,14.99 |
| Packsize | aipintxitem_str.csv.ovr | Optional | 769,10772144,12 |
| PresentationStock | gpresstocksr.csv.ovr | Optional | 769,10772144,20 |
| Leadtime | aipintxitem_str.csv.ovr | Required | 769,10772144,7 |
| Reviewtime | aipintxitem_str.csv.ovr | Required | 769,10772144,7 |
| Rounding threshold | ground_thrshsr.csv.ovr | Optional | 769,10772144,,5 |
| Space per unit | spaceissr.csv.ovr | Optional | 769,10772144,20 |
| Forecast Item Flag | frcstflagsr.csv.ovr | Required | 769,10772144,true |

Measures from a Demand Forecasting Application for Store Optimization

Note: All measures are in comma-separated values file format.

Table 3–15 Measures from a Demand Forecasting Application for Store Optimization

| Name | Filename | Required/Optional | Example |
|------------------------|----------------------|-------------------|-----------------------------|
| Item/store/week | | | |
| Weekly forecast | wklyfcstusr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Weekly cumint | wklycumintsr.csv.ovr | Required | 20091231,769,10772144,75.00 |

Measures for AIP Integration

These measures must be loaded into the RO domain and be in sync with the integration hierarchy data prior to executing the AIP to RO interface. These measures ensure that the imported AIP data is successfully optimized and replenished, which in

turn allows RO to produce meaningful data to be exported back to AIP based on the selected Replenishment method.

Table 3–16 Measures for AIP Integration

| Name | Filename | Required/Optional | Example |
|-------------------------------------|-------------------------|-------------------|-----------------------------|
| Weekly sales: actual sales at store | actsalsr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Weekly on hand inventory | wklyinv_ohusr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Item Price | gpricesr.csv.ovr | Required | 769,10772144,29.99 |
| Item Cost | gcostsr.csv.ovr | Required | 769,10772144,14.99 |
| Leadtime | aipintxitem_str.csv.ovr | Required | 769,10772144,7 |
| Weekly forecast | wklyfcstusr.csv.ovr | Required | 20091231,769,10772144,50.00 |
| Weekly cumint | wklycumintsr.csv.ovr | Required | 20091231,769,10772144,75.00 |

Measures from APC RO for Store Optimization

Table 3–17 Measures from APC RO for Store Optimization

| Name | Filename |
|---|----------------------------------|
| Store Scenario | |
| Replenishment method | rplmthscnsr.csv.ovr, string type |
| Replenishment parameter 1 | rplparm1scnsr.csv.ovr |
| Replenishment parameter 2 | rplparm2scnsr.csv.ovr |
| Replenishment auxiliary parameter 1 | auxparm1scnsr.csv.ovr |
| Replenishment auxiliary parameter 2 | auxparm2scnsr.csv.ovr |
| Scenario priority | priorityscnsr.csv.ovr |
| Store APC group | |
| APC group leadtime lower bound | apcltlbagsr.csv.ovr |
| APC group leadtime upper bound | apcltubagsr.csv.ovr |
| APC group mean sales lower bound | apcmeanlbagsr.csv.ovr |
| APC group mean sales upper bound | apcmeanubagsr.csv.ovr |
| APC group sales variability lower bound | apcvarlbagsr.csv.ovr |
| APC group sales variability upper bound | apcvarubagsr.csv.ovr |
| Store APC group/Store Scenario | |
| Service level | servlevelgssr.csv.ovr |
| Simulated average demand | simavgdmndgssr.csv.ovr |
| Week of supply | wosgssr.csv.ovr |
| Average order frequency | avgordfrgssr.csv.ovr |
| Average order size | avgordsizgssr.csv.ovr |
| Wastage | simwastegssr.csv.ovr |
| Stockouts | stkoutnmgssr.csv.ovr |
| Item/store/store scenario | |

Table 3–17 (Cont.) Measures from APC RO for Store Optimization

| Name | Filename |
|--------------------------|-------------------------|
| Service level | servlevelisssr.csv.ovr |
| Simulated average demand | simavgdmndisssr.csv.ovr |
| Weekly of supply | wosisssr.csv.ovr |
| Average order frequency | avgordfrqisssr.csv.ovr |
| Average order size | avgordsizisssr.csv.ovr |
| Wastage | simwasteisssr.csv.ovr |
| Stockouts | stkoutnmisssr.csv.ovr |

Required Data Files for Warehouse Optimization

The following data files are required for warehouse optimization:

Measures from a Merchandising or Replenishment System for Warehouse Optimization

Note: All measures are in comma-separated values file format.

Table 3–18 Measures for Warehouse Optimization

| Name | Filename | Required/Optional | Example |
|---|-------------------------|-------------------|-----------------------------|
| Item/warehouse/week | | | |
| Weekly sales: actual sales at warehouse | actsalwh.csv.ovr | Required | 20091231,12,10772144,500.00 |
| Weekly sales: cloned sales at warehouse | clonesalwh.csv.ovr | Optional | 20091231,12,10772144,500.00 |
| Weekly on hand inventory | wklyinv_ohuwh.csv.ovr | Required | 20091231,12,10772144,500.00 |
| Weekly on order inventory | wklyinv_oouwh.csv.ovr | Optional | 20091231,12,10772144,600.00 |
| Weekly order unit | wklyorderuwh.csv.ovr | Optional | 20091231,12,10772144,400.00 |
| Weekly lost sales units | wklylostslsuwh.csv.ovr | Optional | 20091231,12,10772144,100.00 |
| Item/warehouse | | | |
| Price | gpricewh.csv.ovr | Required | 12,10772144,29.99 |
| Cost | gcostwh.csv.ovr | Required | 12,10772144,14.99 |
| Packsize | aipintxitem_str.csv.ovr | Optional | 12,10772144,12.00 |
| PresentationStock | gpresstockwh.csv.ovr | Optional | 12,10772144,0 |
| Leadtime | aipintxitem_str.csv.ovr | Required | 12,10772144,7 |
| Reviewtime | aipintxitem_dc.csv.ovr | Required | 12,10772144,7 |

Table 3–18 (Cont.) Measures for Warehouse Optimization

| Name | Filename | Required/Optional | Example |
|--------------------|------------------------|-------------------|------------------|
| Rounding threshold | ground_thrshwh.csv.ovr | Optional | 12,10772144,.5 |
| Space per unit | spaceiswh.csv.ovr | Optional | 12,10772144,20 |
| Forecast Item Flag | frcstflagwh.csv.ovr | Required | 12,10772144,true |

Measures from a Demand Forecasting Application for Warehouse Optimization

Note: All measures are in comma-separated values file format.

Table 3–19 Measures from a Demand Forecasting Application for Warehouse Optimization

| Name | Filename | Required/Optional | Example |
|----------------------------|----------------------|-------------------|-----------------------------|
| Item/warehouse/week | | | |
| Weekly forecast | wklyfcstuwsh.csv.ovr | Required | 20091231,12,10772144,500.00 |
| Weekly cumint | wklycumintwh.csv.ovr | Required | 20091231,12,10772144,750.00 |

Measures from APC RO for Warehouse Optimization

Table 3–20 Measures from APC RO for Warehouse Optimization

| Name | Filename |
|---|----------------------------------|
| Warehouse Scenario | |
| Replenishment method | rplmthscnwh.csv.ovr, string type |
| Replenishment parameter 1 | rplparm1scnwh.csv.ovr |
| Replenishment parameter 2 | rplparm2scnwh.csv.ovr |
| Replenishment auxiliary parameter 1 | auxparm1scnwh.csv.ovr |
| Replenishment auxiliary parameter 2 | auxparm2scnwh.csv.ovr |
| Scenario priority | priorityscnwh.csv.ovr |
| Warehouse APC group | |
| APC group leadtime lower bound | apcltlbagwh.csv.ovr |
| APC group leadtime upper bound | apcltubagwh.csv.ovr |
| APC group mean sales lower bound | apcmeanlbagwh.csv.ovr |
| APC group mean sales upper bound | apcmeanubagwh.csv.ovr |
| APC group sales variability lower bound | apcvarlbagwh.csv.ovr |
| APC group sales variability upper bound | apcvarubagwh.csv.ovr |
| Warehouse APC group/Warehouse Scenario | |
| Service level | servlevelgswh.csv.ovr |
| Simulated average demand | simavgdmndgswh.csv.ovr |
| Week of supply | wosgswh.csv.ovr |
| Average order frequency | avgordfrgswh.csv.ovr |
| Average order size | avgordsizgswh.csv.ovr |

Table 3–20 (Cont.) Measures from APC RO for Warehouse Optimization

| Name | Filename |
|--|-------------------------|
| Wastage | simwastegswh.csv.ovr |
| Stockouts | stkoutnmgswh.csv.ovr |
| Item/warehouse/warehouse scenario | |
| Service level | servlevelisswh.csv.ovr |
| Simulated average demand | simavgdmndisswh.csv.ovr |
| Weekly of supply | wosisswh.csv.ovr |
| Average order frequency | avgordfrqisswh.csv.ovr |
| Average order size | avgordsizisswh.csv.ovr |
| Wastage | simwasteisswh.csv.ovr |
| Stockouts | stkoutnmisswh.csv.ovr |

Required Files for Internal Data

Note: This measure is loaded from a fixed width file. The widths of the two fields are 20 characters each. The entry should be left-justified.

The following internal data files are required and are included in the base releases:

Table 3–21 Internal Data Files

| Name | Filename | Required/Optional | Example |
|---------------------|-------------------|-------------------|-------------|
| KEK | | | |
| W value | gw_val.csv.ovr | Required | 102, 2.4875 |
| Z value | gz_val.csv.ovr | Required | |
| PI | | | |
| Average sales index | gmean_sls_ind.ovr | Required | pi016, 0.16 |
| Safety stocks | gpi_val.ovr | Required | |

Configuration Files for the RPAS Fusion Client

The RO installation software enables you to install the Activity Taskflow and Online Help files for the RPAS Fusion Client. In order to install the Activity Taskflow files, the RPAS Fusion Client must already be installed. For more information on installing the RPAS Fusion Client, refer to the Oracle Retail Predictive Application Server Installation Guide.

During the RPAS Fusion Client installation, the installer automatically sets up the RPAS domain connection configurations in the ProfileList.xml file. If you choose to set up the domain connection after the installation or set up an additional domain, you must manually set up the connection. For more information, refer to the Oracle Retail Predictive Application Server Administration Guide for the RPAS Fusion Client.

Creating Users and User Groups

For greater security, users and user groups are not automatically created when you build or patch a domain. To create users and user groups, you must use the `usermgr` utility. To learn more about `usermgr`, see the Operational Utilities chapter of the Oracle Retail Predictive Application Server Administration Guide for the RPAS Classic Client and Oracle Retail Predictive Application Server Administration Guide for the RPAS Fusion Client.

Loading and Extracting Data

Data is loaded into RO using the standard RPAS approach. See the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* and *Oracle Retail Predictive Application Server Administration Guide for the RPAS Fusion Client* for details on formatting the load data files and on the utilities that enable administrators to load data into RPAS. For information on integration scripts, see [Chapter 4, "Integration"](#). For information on any other batch scripts, see [Chapter 7, "Batch Processing"](#).

Add each hierarchy or data load. To synchronize the data in the domain, run the four rule groups listed below.

Store Optimization

- `mace -d $MASTER_RO_DOMAIN -run -group post_gdataloadsr`
- `post_gdataloadsr` need to be run from master domain
- `mace -d $SUB_DOMAIN -run -group post_dataaloadsr`
- `post_dataaloadsr` need to be run from each sub domain

Warehouse Optimization

- `mace -d $MASTER_RO_DOMAIN -run -group post_gdataloadWh`
- `post_gdataloadWh` need to be run from master domain
- `mace -d $SUB_DOMAIN -run -group post_dataaloadWh`
- `post_dataaloadWh` need to be run from each sub domain

Building the RO Domain

The script used to build or patch the RO domain is described in this section. The script is located in the `<ro_directory>/bin` directory.

Note: To patch a domain, use `buildRO.sh` with the `-p` flag as described in [Table 3–22](#).

Batch Designs

This section contains detailed information on the following build scripts:

[Building a Domain](#)

Building a Domain

Script

buildRO.sh

Usage

buildRO.sh <options -cdil> <flags -gpt>

Table 3–22 Domain Descriptions

| Argument | Valid Values | Description |
|----------|--------------|---|
| options | c | Configuration directory Default is <ro_directory>/config |
| | d | Domain path Default is <ro_directory>/domain |
| | i | Input directory Default is <ro_directory>/input |
| | l | Log directory Default is <ro_directory>/logs |
| flags | g | Set this flag to use debug function libraries. |
| | p | Set this flag to make a patch build. |
| | t | Set this flag to make a test build. |

Notes

- The script uses the Configuration Tools rpasInstall utility to build a domain. See the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* and *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client* for details on this utility.
- The script also uses the mace and loadmeasure RPAS utilities. See the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* and *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client* for details on these utilities.
- All hierarchy and measure files are placed in \$RO_HOME/input.

Converting a Domain

Starting with Release 13.3, RPAS uses integer indexing for hierarchy positions. As a result, an RPAS utility program, convertDomain, needs to be executed before an old domain can be patched to Release 13.3.

Note: For additional information about upgrading RO to a 13.4.3 domain, see the section, “For the Server” in the *Oracle Retail Replenishment Optimization Installation Guide*.

These instructions must be completed before beginning an upgrade to Release 13.4.3.

Prior to running convertDomain, the following steps must be performed:

1. Load three hierarchies into the RO domain, as follows:

- a. Ensure that these three files are present in the domain's input folder:

- excp.dat
- optg.csv.dat
- repl.dat

- b. Run the following commands:

```
$ loadHier -d "{domain-folder}" -load excp
$ loadHier -d "{domain-folder}" -load optg
$ loadHier -d "{domain-folder}" -load repl
```

For additional details about the loadHier utility and its command line flags, refer to the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* or the *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client*.

2. Upgrade and patch the RO domain to the latest 13.2.3 hotfix. Follow the instructions provided in the chapter, "Patch Installation", in the 13.2.3 *Oracle Retail Replenishment Optimization Installation Guide*.

Note: Always follow the installation instructions related to the release that you are upgrading to as there may be differences from release to release.

3. Run convertDomain as described in the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* or the *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client*.

This chapter describes the following information:

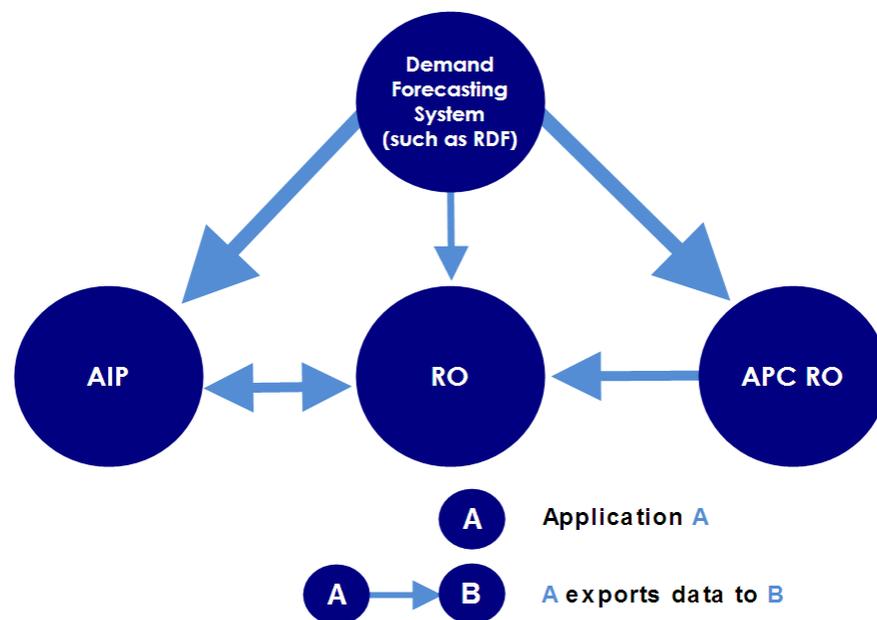
- [Overview of the Integrated Inventory Planning Suite](#)
- [Overview of the Analytic Parameter Calculator for Replenishment Optimization \(APC RO\) and RO Integration](#)
- [Integration Configuration](#)
- [Export to Merchandise System](#)

Overview of the Integrated Inventory Planning Suite

The Integrated Inventory Planning Suite is the integration of Demand Forecasting (RDF), Advanced Inventory Planning (AIP), Replenishment Optimization (RO), and Analytic Parameter Calculator Replenishment Optimization (APC RO) as a full-suite inventory management solution for retailers.

Figure 4–1 shows the conceptual overview of the integration of these products.

Figure 4–1 Conceptual Overview

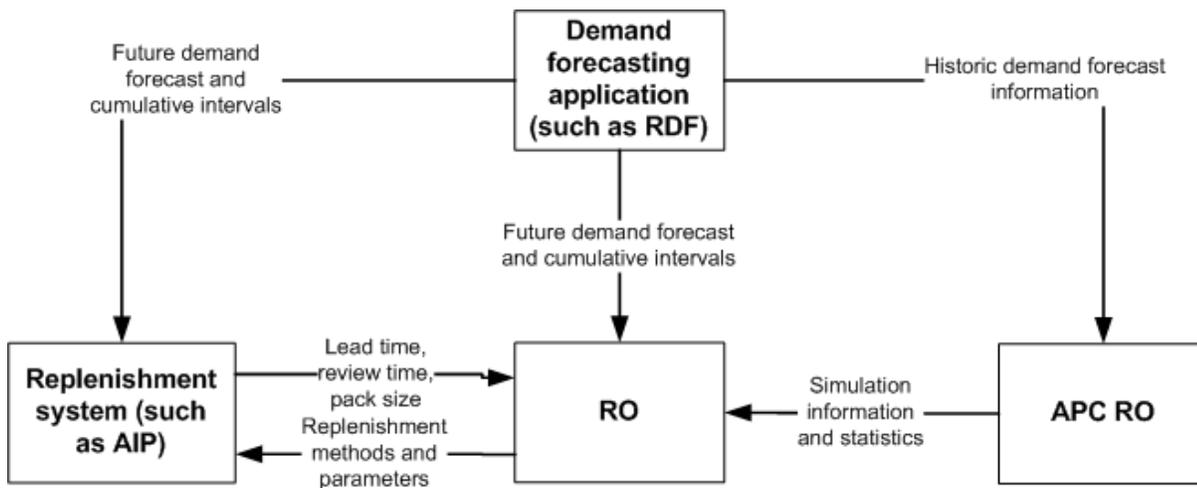


This solution supports data sharing among these applications. Note that the data sharing functionality is not dependent on the presence of all these applications. The defined data sharing between any of the applications works for the entire suite as well as for a subset of the applications.

Integrated Inventory Planning Suite Data Flow

Figure 4–2 shows the integration of the Integrated Inventory Planning Suite applications and the flow of data among those applications. Note that the figure below shows a replenishment system. This can be AIP or any other replenishment system. The demand forecasting application can be RDF or any other forecasting system.

Figure 4–2 Integrated Inventory Planning Suite Data Flow



Data Flow Description

These descriptions explain each of the data flows in Figure 4–2.

From a Demand Forecasting Application (such as RDF) to APC RO

Sends historic demand forecasts for a forecast horizon for a series of forecast start dates. It sends a separate forecast file for each forecast start date.

From a Demand Forecasting Application (such as RDF) to a Replenishment System (such as AIP)

- Sends time-phased demand forecasts (starting today and looking forward) at the item/store level.
- Sends the cumulative standard deviation of the forecast. This is needed for the calculation of safety stock.

From APC RO to RO

Sends simulation information and statistics:

Item/location/scenario level information
 Mean/variability/lead time grouping level information
 Mean/variabilitygrouping/lead time/scenario level information
 Scenario level information

From a Replenishment System (such as AIP) to RO

- Sends the lead time in flat files. The lead time (or order cycle) pattern generally contains the same lead time on all days that have a lead time; however, the lead time may increase for the weekend. Therefore, the most common lead time is found during the business week.
- Sends the review time in flat files. Review time is the number of days until the next possible receipt. It is a key factor in determining the minimum amount of projected stock that should be available until the next receipt. Because review time can change daily, the minimum available inventory must cover the longest review time in order to avoid stock outs.
- Sends the ordering pack size in flat files. The ordering pack size is the preferred pack size of an item that should be ordered from a source to the destination.

From a Demand Forecasting Application (such as RDF) to RO

- Sends time-phased demand forecasts (starting at the current day and looking forward) at the item/store level. This allows the user to understand how the replenishment settings would perform based on that demand.
- Sends the cumulative standard deviation of the forecast. This is needed for the calculation of safety stock.

From RO to a Replenishment System (such as AIP)

- Sends the recommended replenishment methods and parameters in flat files based on the schedule that the user sets.
- For AIP specifically, RO performs the necessary transformations needed to convert order-based replenishment parameters to a relevant form before sending it to AIP since AIP is a receipts-based system.

Overview of the Analytic Parameter Calculator for Replenishment Optimization (APC RO) and RO Integration

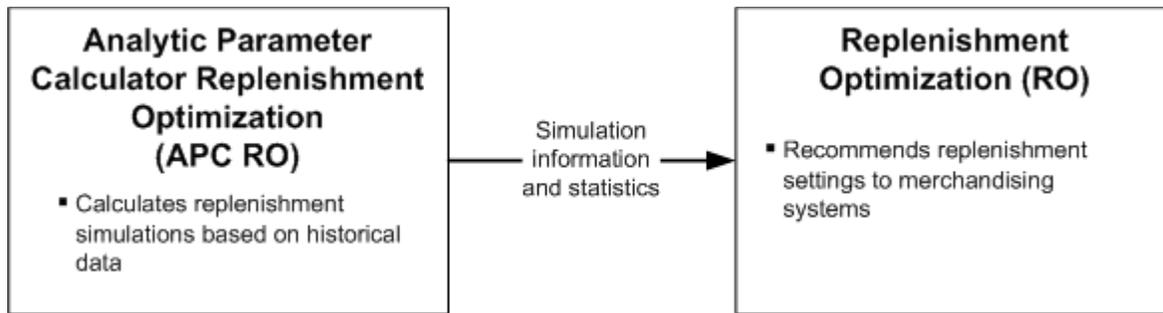
Analytic Parameter Calculator for Replenishment Optimization (APC RO) is an analytical, fact-based application that uses a client's historical sales patterns to perform replenishment simulations and calculate statistics. RO uses the APC RO results to make optimal replenishment recommendations based on specific business goals and retail constraints.

See the APC RO documentation for more information.

APC RO and RO Data Flow

[Figure 4-3](#) shows the integration of APC RO and RO and the flow of data between them.

Figure 4–3 APC RO and RO Integration



Data Flow Description

These descriptions explain the data flow in Figure 4–3.

Note: For information on required data files, see [Required Data Files for Store Optimization](#).

From APC RO to RO

The following data is imported into RO from APC RO:

- Item/location/scenario level information
- Mean/variability/lead time grouping level information
- Mean/variability grouping/lead time/scenario level information
- Scenario level information

Item/Location/Scenario Level Information
Table 4–1 Item/Location/Scenario Level Data Files

| Name | ETL Name |
|-------------------------------------|------------------------|
| Store Weeks of Supply Data | wosissr.csv.ovr |
| Store Service Level Data | servlevelissr.csv.ovr |
| Store Lead Time Data | gleadtimesr.csv.ovr |
| Store Simulated Average Demand Data | simavgdmndissr.csv.ovr |
| Store Average Order Frequency Data | avgordfrqissr.csv.ovr |
| Store Average Order Size Data | avgordsizissr.csv.ovr |
| Store Number of Stock-outs Data | stkoutmissr.csv.ovr |
| Store Average Simulated OUTL Data | simavgoutlissr.csv.ovr |
| Store Average Simulated OP Data | simavgopissr.csv.ovr |
| Store Average Wastage Data | simwasteissr.csv.ovr |

Mean/Variability/Lead Time Grouping Level Information
Table 4–2 Mean/Variability/Lead Time Grouping Level Data Files

| Name | ETL Name |
|-----------------------|-----------------------|
| Mean Lower Bound Data | apcmeanlbagsr.csv.ovr |
| Mean Upper Bound Data | apcmeanubagsr.csv.ovr |

Table 4–2 (Cont.) Mean/Variability/Lead Time Grouping Level Data Files

| Name | ETL Name |
|------------------------------|----------------------|
| Variability Lower Bound Data | apcvarlbagsr.csv.ovr |
| Variability Upper Bound Data | apcvarubagsr.csv.ovr |
| Lead Time Lower Bound Data | apcltlbagsr.csv.ovr |
| Lead Time Upper Bound Data | apcltubagsr.csv.ovr |

Mean/Variability Grouping/Scenario Level Information

Table 4–3 Mean/Variability Grouping/Scenario Level Data Files

| Name | ETL Name |
|---|------------------------|
| Store G/S Weeks of Supply Data | wosgssr.csv.ovr |
| Store G/S Service Level Data | servlevelgssr.csv.ovr |
| Store G/S Simulated Average Demand Data | simavgdmndgssr.csv.ovr |
| Store G/S Average Order Frequency Data | avgordfrqgssr.csv.ovr |
| Store G/S Average Order Size Data | avgordsizgssr.csv.ovr |
| Store G/S Number of Stock-outs Data | stkoutnmgssr.csv.ovr |
| Warehouse G/S WOS Data | whswosgwsr.csv.ovr |
| Warehouse G/S Simulated Average Issues Data | whssimdmngwsr.csv.ovr |
| Store G/S Average Simulated OUTL Data | simavgoutlgssr.csv.ovr |
| Store G.S Average Simulated OP Data | simavgopgssr.csv.ovr |
| Store G/S Average Wastage Data | simwastegssr.csv.ovr |

Scenario Level Information

Table 4–4 Scenario Level Data Files

| Name | ETL Name |
|----------------------------------|-----------------------|
| Store Replenishment Method Data | rplmthscnsr.csv.ovr |
| Store Parameter 1 Data | rplparm1scnsr.csv.ovr |
| Store Parameter 2 Data | rplparm2scnsr.csv.ovr |
| Store Auxiliary Parameter 1 Data | auxparm1scnsr.csv.ovr |
| Store Auxiliary Parameter 2 Data | auxparm2scnsr.csv.ovr |

APC RO Data Load Process

APC RO provides numerous measure data files to RO. These hierarchy files can be generated using APC RO measure data files.

Perform the APC RO Data Load process when RO is initially configured.

| Hierarchy Files | APC RO Measure Data File Name |
|----------------------------------|-------------------------------|
| store replenishment scenario | scn.csv.dat |
| warehouse replenishment scenario | wscn.csv.dat |
| store APC-group | apcg.csv.dat |
| warehouse APC-group | wapg.csv.dat |

Automatic APC RO Data Loading

To automate the APC RO Data load process, use the following script :

```
ro_load_apcro_data.sh
```

This script takes the domain path and output file from APC RO in one of these formats:

- xxx.tar.gz file
- xxx.tar file
- rpas standard .ovr files

The script then extracts the files from archive and performs the steps below in [APC RO Data Load Process Steps](#).

| Input Parameters | Description | Use |
|------------------|---|----------|
| -d domain_path | Indicates the RO domain path. | Required |
| -s data_path | Indicates the path location of APC RO data. Data files should be in formats of either: <ul style="list-style-type: none"> ■ .gz ■ .tar ■ rpas standard .ovr | Required |
| -P | Indicates whether you want to add -purgeAge 0 when performing load hier | Optional |

APC RO Data Load Process Steps

Follow the steps below to implement the APC RO data load process.

There are three scripts under \$RPAS_HOME/bin necessary to generate RO hierarchy files based on APC RO data:

- gen_RO_1d_hiers_sr.ksh
- gen_RO_1d_hiers_wh.ksh
- gen_1d_hiers.ksh

The gen_RO_1d_hiers_sr.ksh generates RO hierarchy files for store. The gen_RO_1d_hiers_wh.ksh generates RO hierarchy files for warehouse.

1. Run gen_RO_1d_hiers_sr.ksh and gen_RO_1d_hiers_wh.ksh from the same directory as the APC RO data files and ensure that these hierarchy files are generated:
 - scn.csv.dat
 - wscn.csv.dat
 - apcg.csv.dat
 - wapg.csv.dat
2. Update these hierarchy files.

Note: For the hierarchy files below, **-purgeAge 0** is only necessary when the previous positions along the dimension needs to be wiped out. Otherwise, do not use it.

| Hierarchy Files | File Name |
|----------------------------------|--------------------------------------|
| store replenishment scenario | loadHier -d . -load scn -purgeAge 0 |
| warehouse replenishment scenario | loadHier -d . -load wscn -purgeAge 0 |
| store APC-group | loadHier -d . -load apcg -purgeAge 0 |
| warehouse APC-group | loadHier -d . -load wapg -purgeAge 0 |

- Load the APC RO measure data files one by one.

Example: `loadmeasure -d . -m wosisssr`

Integration Configuration

The following sections describe the configuration needed for RO:

- [Setting Environment Variables](#)
- [Setting Default Measure Values](#)
- [Integration Scripts](#)
- [Batch Environment Scripts](#)
- [Using runBatch](#)
- [Batch Designs](#)
- [RO Stores Data Mapping](#)

Setting Environment Variables

After RO is installed, define the environment variables that RO needs to execute.

ro_environment.sh

The variables displayed in [Table 4–5](#) need to be defined properly.

Table 4–5 Environment Variables

| Environment Variable | Description |
|----------------------|--|
| RO_DOMAIN | The location of the RO domain. The default is set to the value set in TEST_RO_DOMAIN. |
| RO_CONTROL_FILES | The location of control files for this interface. The default is set to \${RO_DOMAIN}/control_files. |
| RO_TEMP_DIR | This should be a writable path. Use of /tmp is discouraged due to the typical small size of this partition on UNIX machines. |
| RO_LOG_HOME | The location of log files. The default is set to \${RO_DOMAIN}/logs. |
| RO_LOG_LEVEL | The default is set to ERROR if \$RPAS_LOG_LEVEL is not specified. |
| RO_FILE_TYPE | Format of files can be either CSV or TXT. The default is set to CSV. |
| AIP_INPUT | The location of input files coming from AIP. The default is \${RO_DOMAIN}/interface/aip/input. |
| AIP_OUTPUT | The location of output files to be sent to AIP. Default is \${RO_DOMAIN}/interface/aip/output. |

Table 4–5 (Cont.) Environment Variables

| Environment Variable | Description |
|----------------------|--|
| CLASSPATH | Include the following in CLASSPATH: \$RPAS_HOME/applib/RO.jar \$RPAS_HOME/applib/groovy-all.jar \$RPAS_HOME/applib/ant.jar \$RPAS_HOME/applib/ant-launcher.jar \$RPAS_HOME/applib/aaiReplenOpt.jar \$RPAS_HOME/applib/aaijni.jar |

Setting Default Measure Values

The following measures need to be adjusted to have the correct values based on implementation.

Export to Replenishment System

This measure specifies which product/location should be considered when extracting data for AIP. By default all product/location data are exported if the measure is not populated.

Integration Scripts

Integration scripts are used for moving data between applications. [Table 4–6](#) lists the integration scripts for RO.

Table 4–6 Integration Scripts

| Application | Script | Arguments | Description |
|--------------------------|-----------------------|-----------|---|
| RO Stores Implementation | ro_export_to_aip.sh | None | This is the main script that invokes the export process and creates data files to be sent to AIP. |
| RO Stores Implementation | ro_import_from_aip.sh | None | This is the main script that invokes the load process and loads AIP data into RO. |

Batch Environment Scripts

ro_environment.sh sets the necessary environment variables for execution of RO integration scripts. It is invoked within the integration scripts listed in the table above. The details of environment variables are listed in the [Setting Environment Variables](#) section.

Using runBatch

To execute a batch, the integration scripts in RO make a call to the Groovy class runBatch, which parses the xml file <batchStep>.xml.

The following describes the Groovy runBatch.class:

- runBatch is invoked like any other Java class provided that the Groovy jar files have been properly set in the class path.
- runBatch requires two arguments that are paths to a systemVariable.xml, which is located in the RPAS_HOME. The other XML file contains details of the batch to

run. For instance, for RO to export to AIP, use the xml file called exportSteps.xml. For RO import from AIP, use a similar xml file called importSteps.xml.

```
java runBatch $RPAS_HOME/applib/resources/systemVariables.xml $RO_
DOMAIN/interface/aip/< >.xml
```

- <batchStep>.xml should be located at \$RO_DOMAIN/interface/aip
- <batchStep>.xml follows the format below. Within the batchSteps tags, there are repeated batchStep tags that represent the different steps in the batch. Each batchStep has two attributes: name and run. To turn off a specific batchStep, change the run attribute from **true** to **false**.

```
<batchsteps>
  <batchstep>
    <name>Step1</name>
    <run>true</run>
  </batchstep>
  <batchstep>
    <name>Step2</name>
    <run>true</run>
  </batchstep>
</batchsteps>
```

Batch Designs

The following integration scripts exist for stores and warehouses.

For stores:

- ro_export_to_aip.sh
- ro_import_from_aip.sh

For warehouses:

- ro_export_to_aip_wh.sh
- ro_import_from_aip_wh.sh

Script Resource

The script resource is the same for all the integration scripts listed above.

Path: \$RPAS_HOME/applib/resources

AIP Import/Export Data Paths

The import/export data path is the same for all the integration scripts listed above.

Path: \$RO_DOMAIN/interface/aip

RO Stores Data Mapping

The mapping data below is for stores only.

Output Measure Data

The table below displays the measure files that RO sends to AIP.

Table 4–7 Output Measure Data

| File Name | Data Elements |
|----------------|---|
| STR_MINMAX | <ul style="list-style-type: none"> ■ Store Min Stock ■ Store Max Stock ■ Store Replenishment Method |
| STR_DYNAMIC | <ul style="list-style-type: none"> ■ Store Service Level ■ Store Inventory Selling Days ■ Store Replenishment Method |
| STR_TIMESUPPLY | <ul style="list-style-type: none"> ■ Store Min Time Supply Days ■ Store Max Time Supply Days ■ Store Time Supply Horizon ■ Store Replenishment Method |
| STR_HYBRID | <ul style="list-style-type: none"> ■ Store Min Time Supply Days ■ Store Inventory Selling Days ■ Store Replenishment Method |
| STR_POISSON | <ul style="list-style-type: none"> ■ Store Service Level ■ Store Inventory Selling Days ■ Store Replenishment Method |
| STR_MINSS | Store Min Safety Stock Units |
| STR_ROUpdate | Replenishment Optimization Update for Stores |

Input Measure Data

The table below displays the measure files AIP creates for RO.

Table 4–8 Input Measure Data

| File Name | Data Elements |
|--------------|---|
| STR_AIP_DATA | <ul style="list-style-type: none"> ■ Lead Time ■ Review Time ■ Pack Size |

RO Warehouse Data Mapping

The mapping data below is for warehouses only.

Output Measure Data

The table below displays the measure files that RO sends to AIP.

Table 4–9 Output Measure Data

| File Name | Data Elements |
|-----------|--|
| WH_MINMAX | <ul style="list-style-type: none"> ■ Warehouse Min Stock ■ Warehouse Max Stock ■ Warehouse Replenishment Method |

Table 4–9 (Cont.) Output Measure Data

| File Name | Data Elements |
|---------------|---|
| WH_DYNAMIC | <ul style="list-style-type: none"> ■ Warehouse Service Level ■ Warehouse Inventory Selling Days ■ Warehouse Replenishment Method |
| WH_TIMESUPPLY | <ul style="list-style-type: none"> ■ Warehouse Min Time Supply Days ■ Warehouse Max Time Supply Days ■ Warehouse Time Supply Horizon ■ Warehouse Replenishment Method |
| WH_HYBRID | <ul style="list-style-type: none"> ■ Warehouse Min Time Supply Days ■ Warehouse Inventory Selling Days ■ Warehouse Replenishment Method |
| WH_MINSS | Warehouse Min Safety Stock Units |
| WH_ROUpdate | Replenishment Optimization Update for Warehouses |

Input Measure Data

The table below displays the measure files AIP creates for RO.

Table 4–10 Input Measure Data

| File Name | Data Elements |
|-------------|---|
| WH_AIP_DATA | <ul style="list-style-type: none"> ■ Lead Time ■ Review Time ■ Pack Size |

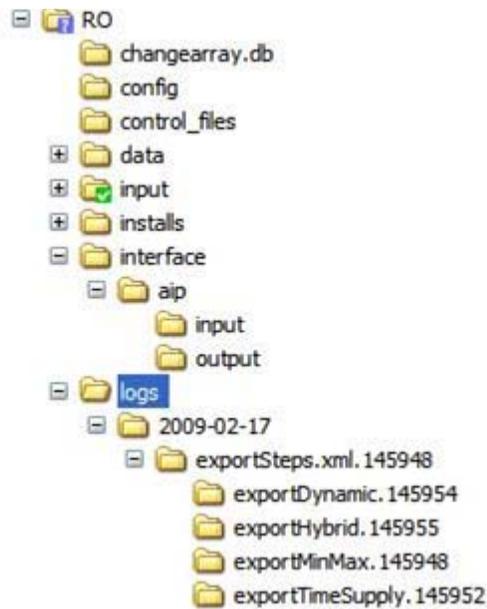
Batch Logs and Settings

The environment variable RO_LOG_LEVEL can be set to one of the following log levels:

- PROFILE
- DEBUG
- INFORMATION
- WARNING
- ERROR

The default is ERROR.

The logs are created in the directory specified in environmental variable RO_LOG_HOME. The logs are contained in a directory with today's date.

Figure 4–4 RO Logs

Export to Merchandise System

To export to RMS, no special handling is provided.

These measures can be exported with exportMeasure or exportData binaries.

- AppRepMthdSr, approved replenishment method on sku/store
- AppRepMthdWh, approved replenishment method on sku/warehouse
- AppReplPval1Sr, approved replenish parameter 1 on sku/store
- AppReplPval1Wh, approved replenish parameter 1 on sku/warehouse
- AppReplPval2Sr, approved replenish parameter 2 on sku/store
- AppReplPval2Wh, approved replenish parameter 2 on sku/warehouse
- AppAxPval1Sr, approved auxiliary replenish parameter 1 on sku/store
- AppAxPval1Wh, approved auxiliary replenish parameter 1 on sku/warehouse
- AppAxPval2Sr, approved auxiliary replenish parameter 2 on sku/store
- AppAxPval2Wh, approved auxiliary replenish parameter 2 on sku/warehouse
- AppOpuSr, approved order point on sku/store
- AppOpuWh, approved order point on sku/warehouse
- AppOutluSr, approved order up to level on sku/store
- AppOutluWh, approved order up to level on sku/warehouse

Configuration Considerations

This chapter provides information on the configuration changes that can be made for RO. For some retailers, parts of the released version of the RO configuration may fit perfectly. However, it is anticipated that changes are needed to make the RO configuration match the organization of the retailer.

Hierarchies are limited to the determination of hierarchy aspects that pertain directly to dimensions, attributes, and facts. Due to RPAS limitations on intersection, distinct hierarchies must exist for the construction of all intersections to support all facts. No more than one dimension from any hierarchy may exist in a measure intersection.

For information on the configuration changes that can be made, see the following sections:

- [Calendar \(CLND\) Hierarchy](#)
- [Product \(PROD\) Hierarchy](#)
- [Location \(LOC\) Hierarchy](#)
- [Subgroup Hierarchy File](#)
- [Store APC Group Hierarchy File](#)
- [Warehouse Scenario Hierarchy File](#)
- [Store Scenario Hierarchy File](#)
- [Warehouse APC Group Hierarchy File](#)
- [Frontier Data Point Hierarchy File](#)
- [Break Point Hierarchy File](#)
- [KEK Hierarchy File](#)
- [PI Hierarchy File](#)

Calendar (CLND) Hierarchy

Figure 5–1 CLND hierarchy in the RO Configuration

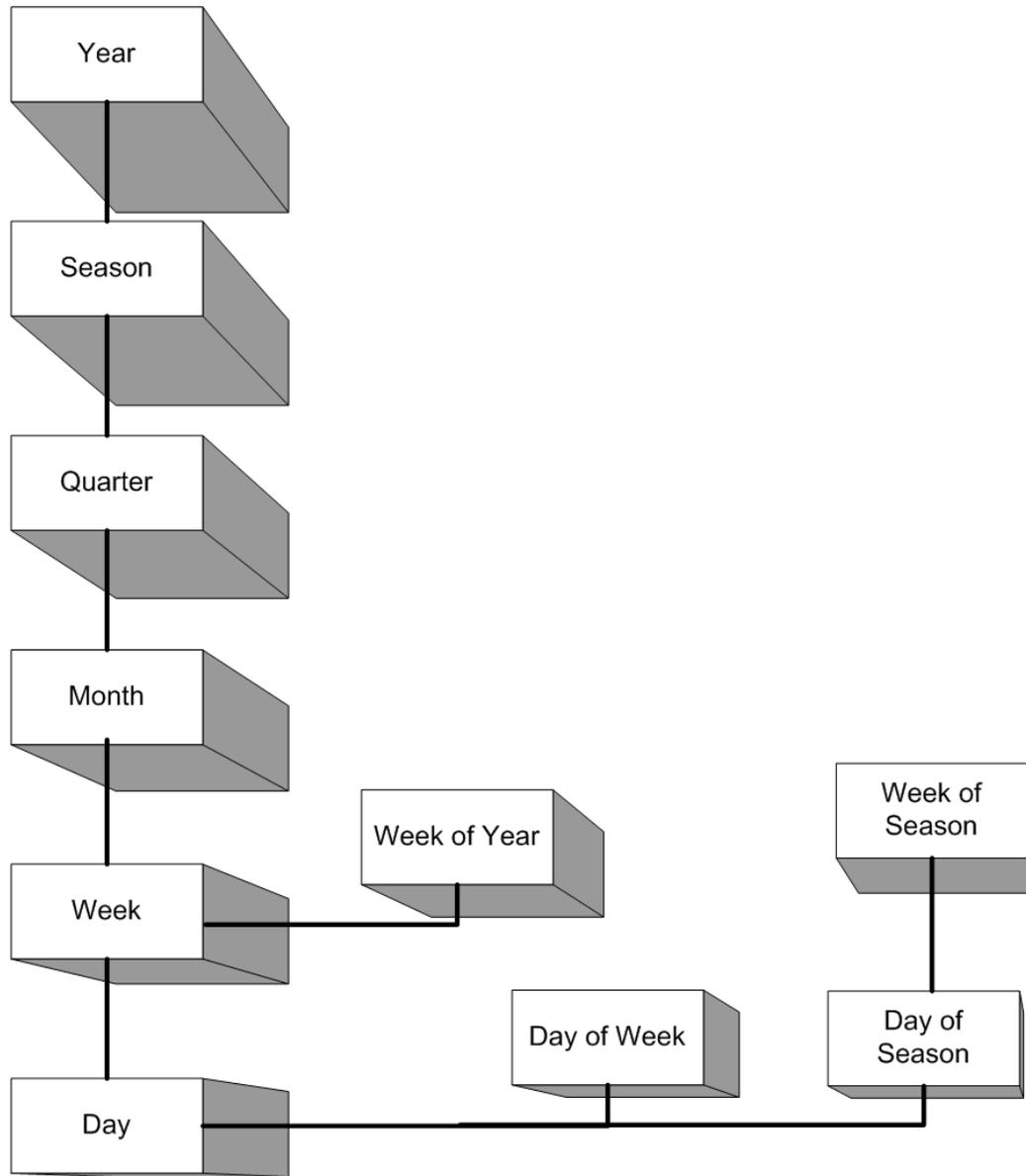


Table 5–1 CLND Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|--------------|----------------|-------|
| YEAR | Year | Main | SSN |
| SSN | Half | Main | QRTR |
| QRTR | Quarter | Main | MNTH |
| MNTH | Month | Main | WEEK |
| WEEK | Week | Main | DAY |
| DAY | Day | Main | None |
| WOY | Week of Year | Alternate | WEEK |

Table 5–1 (Cont.) CLND Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|-------------|----------------|-----------------------|--------------|
| DOW | Day of Week | Alternate | DAY |
| WOS | Week of Season | Alternate | DOS |
| DOS | Day of Season | Alternate | DAY |

The calendar hierarchy represents time in all RPAS solutions. It is a required hierarchy and must have the DAY dimension. As it relates to RO, the calendar hierarchy is needed to store time-phased measures.

Your implementation can structure the calendar hierarchy in any way that best suits your functional needs. Dimensions other than DAY have been included in RO for the purpose of illustration. They can be modified or removed without requiring changes to any other elements of the configuration. Other dimensions and hierarchy branches can also be added without requiring changes to other elements of the configuration.

Product (PROD) Hierarchy

Figure 5–2 *PROD Hierarchy in the RO Configuration*

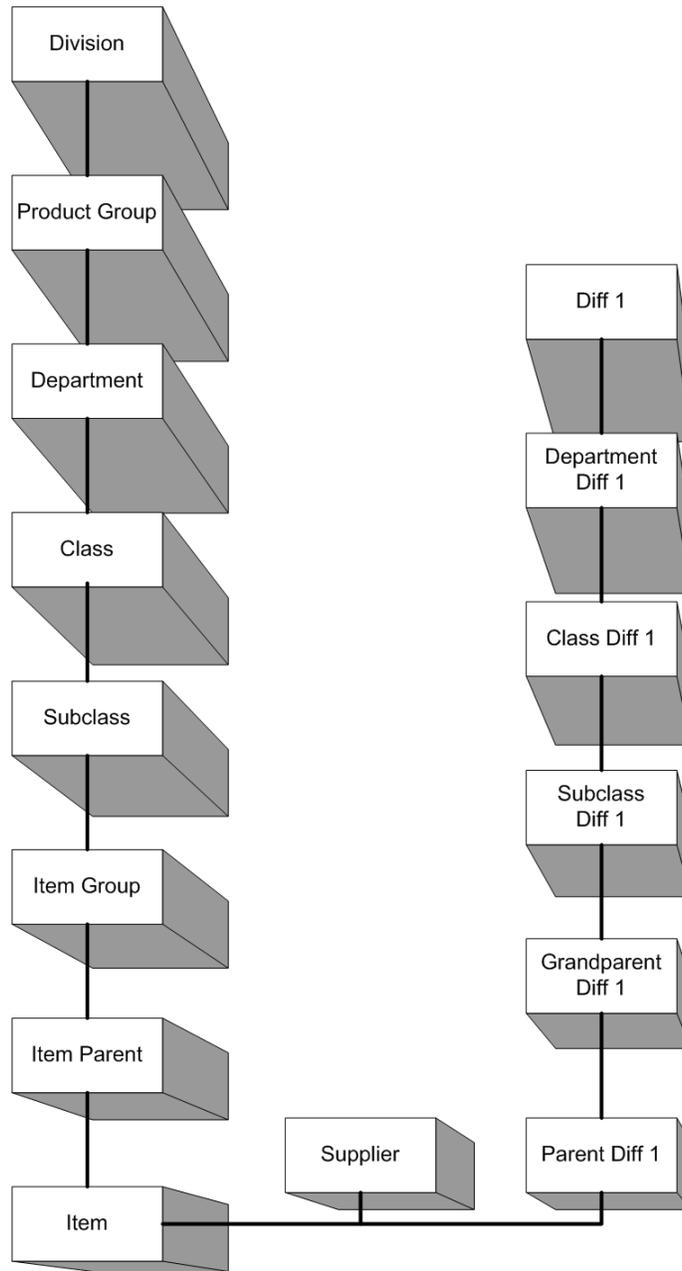


Table 5–2 *PROD Hierarchy in the RO Configuration*

| Name | Label | Hierarchy Type | Child |
|------|------------|----------------|-------|
| DVSN | Division | Main | PGRP |
| PGRP | Group | Main | DEPT |
| DEPT | Department | Main | CLSS |
| CLSS | Class | Main | SCLS |
| SCLS | Subclass | Main | ITGP |

Table 5–2 (Cont.) PROD Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|-------------|-------------------|-----------------------|--------------|
| ITGP | Grandparent | Main | ITPT |
| ITPT | Parent | Main | ITEM |
| ITEM | Item | Main | none |
| SPLR | Supplier | Alternate | ITEM |
| DIF1 | Diff 1 | Alternate | ITEM |
| DPD1 | Dept Diff1 | Alternate | DIF1 |
| CLD1 | Class Diff1 | Alternate | DPD1 |
| SCD1 | Subclass Diff1 | Alternate | CLD1 |
| GPD1 | Grandparent Diff1 | Alternate | SCD1 |
| PTD1 | Parent Diff1 | Alternate | GPD1 |

The product hierarchy (also known as the merchandise hierarchy) represents the retailer's merchandise, that is, merchandise that the retailer sells through its retail channels. RO does not enforce any constraints on the structuring of this hierarchy, but the configuration does use a few levels of this hierarchy extensively in workbook wizards, labeled intersections, rules, position queries, and measure values (Single Hier Select measures). Any changes to this hierarchy must be accompanied by changes to all these elements if they employ the particular level that is being modified or removed. Adding levels or branches or changing labels should not require any changes to the configuration.

From the product hierarchy, the configuration employs ITEM and at least one more dimension higher than ITEM. You may choose the higher level dimension. To reduce patching and upgrade efforts, it is recommended that the names of these levels be left unchanged unless absolutely necessary.

ITEM is necessary because it is the level at which the replenishment recommendations are made. The higher level dimension that you choose is necessary because the optimization goals and optimization constraints are made at this level.

Location (LOC) Hierarchy

Figure 5–3 LOC Hierarchy in the RO Configuration

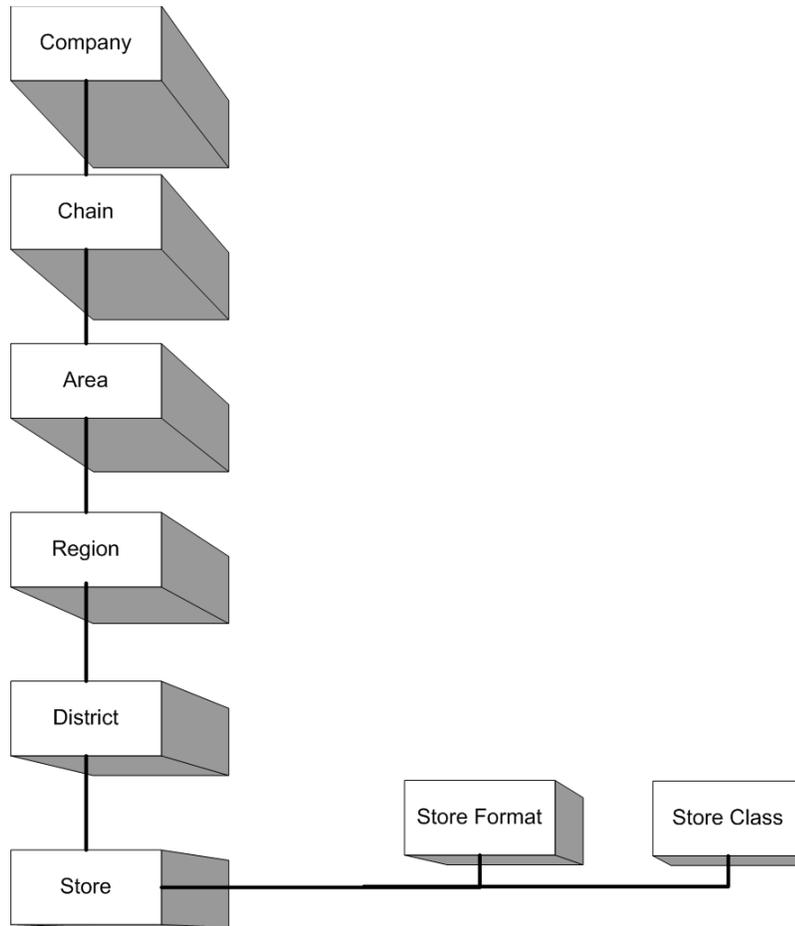


Table 5–3 LOC hierarchy in the RO configuration

| Name | Label | Hierarchy Type | Child |
|------|--------------|----------------|-------|
| COMP | Company | Main | CHN |
| CHN | Chain | Main | AREA |
| AREA | Area | Main | RGN |
| RGN | Region | Main | DIST |
| DIST | District | Main | STR |
| STR | Store | Main | None |
| SFMT | Store Format | Alternate | STR |
| STCL | Store Class | Alternate | STR |

The location hierarchy represents the retailer's retail locations and their roll-ups. RO imposes a few constraints on the structure of this hierarchy; but for the most part, it is flexible.

From the location hierarchy, the configuration employs the store (STR) dimension and at least one more dimension higher than STR, such as region (RGN).

STR is necessary because it is the level at which the replenishment recommendations are made. The higher level dimension that you choose is necessary because the optimization goals and optimization constraints are made at this higher level.

Warehouse Hierarchy (WHS)

The warehouse hierarchy represents the retailer's warehouses or distribution centers. RO assumes a flat hierarchy, but additional roll-ups can be configured.

From the location hierarchy, the configuration employs the warehouse (WRHS) dimension. This dimension is necessary because it is the level at which the replenishment recommendations are made. No higher level dimension is necessary.

Table 5–4 Warehouse Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|-----------------------|----------------|-------|
| WRHS | Warehouse description | Main | none |

Subgroup Hierarchy File

The subgroup hierarchy represents the subgroups generated in the statistical/breakpoint grouping. The number of subgroups that can be generated must be between 1 and the subgroup dimension length. If you want to increase the number of subgroups beyond that limit, you must prepare a subgroup hierarchy file and load the hierarchy with that new file. This hierarchy contains one dimension: subgroup.

Table 5–5 Subgroup Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|----------------------|----------------|-------|
| SGRP | Subgroup Description | Main | none |

Store APC Group Hierarchy File

The Store APC group hierarchy represents the statistical groups generated by APC RO using a statistical grouping. The Store APC group dimension length should be decided by the APC RO calculation. This hierarchy contains one dimension: APC group.

This hierarchy file is generated from APC RO data files. For a description of the file generation, see ["APC RO Data Load Process"](#).

Table 5–6 Store APC Group Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|----------------------|----------------|-------|
| AGRP | Grouping Description | Main | none |

Warehouse APC Group Hierarchy File

The warehouse group hierarchy represents the statistical groups generated by APC RO using a statistical grouping. The Warehouse Group dimension length should be decided by the APC RO calculation. This hierarchy contains one dimension: APC group.

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

Table 5–7 Warehouse APC Group Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|---------------------|----------------|-------|
| WAPG | Warehouse APC Group | Main | none |

Store Scenario Hierarchy File

The store scenario hierarchy represents the different replenishment scenarios used in APC RO. The scenario dimension length should be decided in the APC RO setup. This hierarchy contains one dimension: scenario.

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

Table 5–8 Store Scenario Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|----------------|----------------|-------|
| SCNO | Store Scenario | Main | none |

Warehouse Scenario Hierarchy File

The warehouse scenario hierarchy represents the different replenishment scenarios used in APC RO. The scenario dimension length should be decided in the APC RO setup. This hierarchy contains one dimension: scenario.

This hierarchy file is generated from APC RO data files. For a description of the file generation, see [APC RO Data Load Process](#).

Table 5–9 WHS Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|--------------------|----------------|-------|
| WSCN | Warehouse Scenario | Main | none |

Frontier Data Point Hierarchy File

The frontier data point hierarchy represents the frontier data point on the Inventory/Service Level Trade-off curve that is generated by optimization. The number of frontier data points in a calculation = (maximum scenario number -1) * maximum subgroup number. This hierarchy contains one dimension: frontier data points.

The hierarchy file included in base release should be modified to meet the needs of maximum frontier data point numbers.

Table 5–10 Frontier Data Point Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|----------------|----------------|-------|
| FCPT | Frontier Point | Main | none |

Break Point Hierarchy File

The break point hierarchy represents the break points used in the user-defined break point grouping. The number of position names in the break point dimension should be larger than the maximum number of groups per grouping factor. This hierarchy contains one dimension: break point.

The hierarchy file included in base release should be modified to meet the needs of maximum number of breakpoint.

Table 5–11 Break Point Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|-------------|----------------|-------|
| BKPT | Break Point | Main | none |

KEK Hierarchy File

The KEK hierarchy represents the data points in the w-to-z lookup table used in the dynamic replenishment calculation. The KEK dimension length is decided by the number of entries in the w-to-z lookup table. This hierarchy contains one dimension: KEK.

The hierarchy file in base release should be used without modification.

Table 5–12 KEK Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|-------------------|----------------|-------|
| EW | Lookup Data Point | Main | none |

PI Hierarchy File

The PI hierarchy represents the data points in the poisson safety stock lookup table used in poisson replenishment calculation. The PI dimension is decided by the number of entries in the lookup table. This hierarchy contains one dimension: PI.

The hierarchy file in the base release should be used without modification.

Table 5–13 PI Hierarchy in the RO Configuration

| Name | Label | Hierarchy Type | Child |
|------|---------------------------|----------------|-------|
| PIK | Poisson Lookup Data Point | Main | none |

Configuring the RO Solution

The RO plug-in enables you to specify the intersections for the store and/or warehouse base and optimization levels. Using that data, the plug-in generates the appropriate intersections, measures, rule groups, rules, workbooks, and wizards.

Configuring the RO Solution

From the RPAS Configuration Tools, select **Automation** from the menu bar, then **RO**, and then **Specify Parameters**. The Replenishment Optimization Params window is displayed, as shown in [Figure 6-1](#).

Figure 6-1 Replenishment Optimization Params Window

The screenshot shows a dialog box titled "Replenishment Optimization Params". It has a blue title bar with a red close button. The main area is light beige and contains four rows of labels and text boxes:

- Store Base Intersection: str_item
- Store Optimization Intersection: rgn_dept
- Warehouse Base Intersection: WRHS_item
- Warehouse Optimization Intersection: WHGP_dept

At the bottom left, it says "Partition Dimension: pgrp". At the bottom center, there are two buttons: "OK" and "Cancel".

[Table 6-1](#) describes the fields in this window.

Table 6-1 Fields in the Replenishment Optimization Params Window

| Name | Description |
|-----------|----------------------|
| Title Bar | Title of the window. |

Table 6–1 (Cont.) Fields in the Replenishment Optimization Params Window

| Name | Description |
|---------------------|---|
| Intersection Area | <p>Displays the base and optimization level intersections for stores and warehouses. Click the buttons listed below to open its Select Intersection window.</p> <p>The data is available from these buttons:</p> <ul style="list-style-type: none"> ■ Store Base Intersection ■ Store Optimization Intersection ■ Warehouse Base Intersection ■ Warehouse Optimization Intersection |
| Partition Dimension | Displays the partition level. |

Autogenerating Intersections, Measures, Rules, Workbooks, and Wizards

In the Replenishment Optimization Params window, click **OK**.

The system automatically generates the following to support the configuration entered in the RO plug-in:

- Intersections—All intersections necessary to support the RO solution are created.
- Measures—All measures necessary to support the RO solution are created.
- Rules—All rules and rule groups to support the RO solution are created.
- Workbook Templates—All pre-defined workbook templates to support the RO solution are created.
- Wizards—All necessary wizards to support the RO solution are created.

You may continue to make changes to the RO plug-in configuration, and the autogeneration process may be repeated as often as needed prior to the installation.

Configuring Additional Measures and Rules

In addition to the rules and measures auto-generated by the RO plug-in, it may be useful to configure supporting elements for preprocessing and cloning.

Preprocessing is used to filter the historical data for outliers and promotional lifts, thus making sure that the statistics used in the optimization reflect the true demand.

Cloning is used to create historical demand for new items. Replenishment Optimization works best when items have a year of historical data available. It can work with less, but the quality of the recommendations is not optimal. Hence, for new items, it is better to rely on a like-item's historical data instead of using the new item's short history.

Both preprocessing and cloning configuration and implementation information can be found in the *Oracle Retail Replenishment Optimization Implementation Guide*.

Batch Processing

This chapter contains all the scripts that are needed to execute and maintain the RO environment.

Data is loaded into RO using the standard RPAS approach. See the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* and *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client* for details on formatting the load data files and on the utilities that enable administrators to load data into RPAS.

Note: Comma-separated values (CSV) files are recommended to reduce the sizes of load files.

Batch Script Summary

[Table 7-1](#) describes the directories that are used by the batch scripts. These directories are subdirectories of the <ro_directory> directory. The <ro_directory> is defined by the implementer.

Table 7-1 Directories Used by Batch Scripts

| Directory Name | Content of the Directory |
|----------------|---|
| bin | Batch scripts |
| config | RO template configuration |
| domain | Domains |
| input | Input files for building the domain |
| logs | Log files from running any of the batch scripts |
| temp | Temporary files used by the batch scripts |

Batch Script Summary Table

[Table 7-2](#) summarizes the available batch scripts. The batch scripts are located in this directory:

<ro_directory>/bin

The following information is included in the tables for each batch script:

- A short description of the script
- The name of the script

- Dependencies on other batch scripts

Table 7–2 Batch Script Summary

| Script Name | Description | Suggested Frequency | Dependencies |
|------------------------------------|---------------------------------------|---------------------|--------------|
| ro_optbatch_str.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_optbatch_str_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_optbatch_wh.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_optbatch_wh_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_replbatch_str.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_replbatch_str_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_replbatch_wh.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_replbatch_wh_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_reportbatch_str.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_reportbatch_str_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_reportbatch_wh.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_reportbatch_wh_localdomain.ksh | Optimization Batch: Master Domain | Periodically | None |
| ro_optbatch_localdomain.sh | Optimization Batch: Local Domain | Periodically | None |
| ro_replbatch.sh | Replenishment Batch: Master Domain | Periodically | None |
| ro_replbatch_localdomain.sh | Replenishment Batch: Local Domain | Periodically | None |
| Backup | Backup | Daily | None |

There are two ways to check if a batch was processed successfully:

- In the batch log file, check for any errors, exceptions, or failures. If there are none, the batch has completed successfully.
- A generation ID is used when a batch runs successfully. If a generation ID is available in the wizard process for the approve workbook, this indicates that the batch ran successfully.

For a detailed description of each script, see [Batch Designs](#).

Batch Designs

This section contains detailed information on the following batch scripts:

- [Optimization Batch Script: Master Domain](#)
- [Optimization Batch: Local Domain](#)
- [Replenishment Batch: Master Domain](#)
- [Replenishment Batch: Local Domain](#)
- [Report Batch: Master Domain](#)
- [Report Batch: Local Domain](#)

Some of the scripts have a command line argument to set the maximum number of processes that need to be run in parallel. Setting this argument can help speed up the performance of independent tasks on local domains. The default is 1.

Optimization Batch Script: Master Domain

The optimization batch has two modes: full mode and refresh mode. The optimization batch full mode is run only periodically. It is run either after new simulation results from APC RO are provided or after a dramatic, widespread change in the sales pattern in the domain. The optimization batch generates optimal and constrained service levels versus inventory cost curves when running in full mode. You can select the targeted service level and decide the system-recommended replenishment settings per item/store combination by using the Optimization Review workbook after a full mode optimization batch is run.

ro_optbatch_str.ksh

ro_optbatch_str.ksh should be run from a master domain. It runs store optimization batch. It loops over all local domains.

Script

ro_optbatch_str.sh

Usage

ro_optbatch_str.sh [-d {masterpath}] [-noperallel | -maxprocesses {n}]

ro_optbatch_wh.ksh

ro_optbatch_wh.ksh should be run from a master domain. It runs the warehouse optimization batch. It loops over all local domains.

Script

ro_optbatch_wh.ksh

Usage

ro_optbatch_str.sh [-d {masterpath}] [-noperallel | -maxprocesses {n}]

| Argument | Description |
|-----------------|---|
| -d {masterpath} | The master domain path. |
| -noperallel | Specifies that no-parallel processing should be used. |
| -maxprocesses | Specifies the maximum number of processes used in the optimization batch. |

Optimization Batch: Local Domain

The optimization batch for local domains also has two modes: full mode and refresh mode. The refresh mode batch should be run after every data load, except when the full mode optimization batch is run. The refresh mode batch updates the

system-recommended replenishment settings based on new sales history and previously approved full mode batch result without any user involvement.

ro_optbatch_str_localdomain.ksh

ro_optbatch_str_localdomain.ksh is useful for running the store optimization batch only in a local domain.

Script

ro_optbatch_str_localdomain.ksh

Usage

ro_optbatch_str_localdomain.sh [-d {localpath}]

ro_optbatch_wh_localdomain.ksh

ro_optbatch_wh_localdomain.ksh runs the warehouse optimization batch only in a local domain.

Script

ro_optbatch_wh_localdomain.ksh

Usage

ro_optbatch_str_localdomain.sh [-d {localpath}]

| Argument | Description |
|----------------|------------------------|
| -d {localpath} | The local domain path. |

Replenishment Batch: Master Domain

The replenishment batch generates projected inventory, service levels, and lost sales for the next 13 weeks using the system-recommended replenishment parameters and current replenishment parameters. It runs after each optimization batch run (full mode or refresh mode). The results of replenishment batch can be reviewed in the Replenishment Analyst workbook.

ro_replbatch_str.ksh

ro_replbatch_str.ksh should be run from a master domain. It loops over all local domains.

Script

ro_replbatch_str.ksh

Usage

ro_replbatch_str.sh [-d {masterpath}] [-noparallel | -maxprocesses {n}]

ro_replbatch_wh.ksh

ro_replbatch_wh.ksh should be run from a master domain. It runs the warehouse replenishment batch.

Script

ro_replbatch_wh.ksh

Usage

ro_replbatch_str.sh [-d {masterpath}] [-noparallel | -maxprocesses {n}]

| Argument | Description |
|-----------------|---|
| -d {masterpath} | The master domain path. |
| -noparallel | Specifies that no-parallel processing should be used. |
| -maxprocesses | Specifies the maximum number of processes used in the optimization batch. |

Replenishment Batch: Local Domain

The replenishment batch generates projected inventory, service levels, and lost sales for the next 13 weeks using the system-recommended replenishment parameters and current replenishment parameters. It runs after each optimization batch run (full mode or refresh mode). The results of replenishment batch can be reviewed in the Replenishment Analyst workbook.

ro_replbatch_str_localdomain.ksh

ro_replbatch_str_localdomain.ksh is used for running the batch from only a local domain.

Script

ro_replbatch_str_localdomain.ksh

Usage

ro_replbatch_str_localdomain.sh [-d {localpath}]

ro_replbatch_wh_localdomain.ksh

ro_replbatch_wh_localdomain.ksh runs the warehouse replenishment batch in a local domain.

Script

ro_replbatch_wh_localdomain.ksh

Usage

ro_replbatch_str_localdomain.sh [-d {localpath}]

| Argument | Description |
|----------------|------------------------|
| -d {localpath} | The local domain path. |

Report Batch: Master Domain

The report batch is run after the replenishment batch to populate the measures used in OBIEE reporting.

ro_reportbatch_str.ksh

ro_reportbatch_str.ksh should be run from a master domain. It runs the store report batch in a local domain.

Script

ro_reportbatch_str.ksh

Usage

ro_reportbatch_str.sh [-d {masterpath}] [-noparallel | -maxprocesses {n}]

ro_reportbatch_wh.ksh

ro_reportbatch_wh.ksh should be run from a master domain. It runs the warehouse report batch in a local domain.

Script

ro_reportbatch_wh.ksh

Usage

ro_reportbatch_wh.sh [-d {masterpath}] [-noperallel | -maxprocesses {n}]

| Argument | Description |
|-----------------|---|
| -d {masterpath} | The master domain path. |
| -noperallel | Specifies that no-parallel processing should be used. |
| -maxprocesses | Specifies the maximum number of processes used in the optimization batch. |

Report Batch: Local Domain

The report batch is run after the replenishment batch to populate the measures used in OBIEE reporting.

ro_reportbatch_str_localdomain.ksh

ro_reportbatch_str_localdomain.ksh runs the store report batch in a local domain.

Script

ro_reportbatch_str_localdomain.ksh

Usage

ro_reportbatch_str_localdomain.sh [-d {localpath}]

ro_reportbatch_wh_localdomain.ksh

ro_reportbatch_wh_localdomain.ksh runs the warehouse report batch in a local domain.

Script

ro_reportbatch_wh_localdomain.ksh

Usage

ro_reportbatch_wh._localdomain.sh [-d {localpath}]

| Argument | Description |
|----------------|------------------------|
| -d {localpath} | The local domain path. |

Internationalization

Internationalization is the process of creating software that can be translated more easily. Changes to the code are not specific to any particular market.

Oracle Retail applications have been internationalized to support multiple languages.

Translation

Translation is the process of interpreting and adapting text from one language into another. Although the code itself is not translated, components of the application that are translated include the following:

- Graphical user interface (GUI)
- Error messages

The following components are not translated:

- Documentation (online help, release notes, installation guide, user guide, operations guide)
- Batch programs and messages
- Log files
- Configuration tools
- Reports
- Demonstration data
- Training materials

The user interface has been translated into the following languages:

- Chinese (Simplified)
- Chinese (Traditional)
- Croatian
- Dutch
- French
- German
- Greek
- Hungarian
- Italian

- Japanese
- Korean
- Polish
- Portuguese (Brazilian)
- Russian
- Spanish
- Swedish
- Turkish

Note: For information about adding languages for the first time or for translation information in general, see the *Oracle Retail Predictive Application Server Administration Guide for the Classic Client* or the *Oracle Retail Predictive Application Server Administration Guide for the Fusion Client*.
