Oracle® Retail Replenishment Optimization

Implementation Guide

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Oracle Retail Replenishment Optimization Implementation Guide, Release 14.1.3

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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 14.1.3 documentation set:

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

The following documentation may also be needed when implementing RO:

- *Oracle Retail Planning Batch Script Architecture Implementation Guide*

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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.
italic	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.

1
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* or the *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

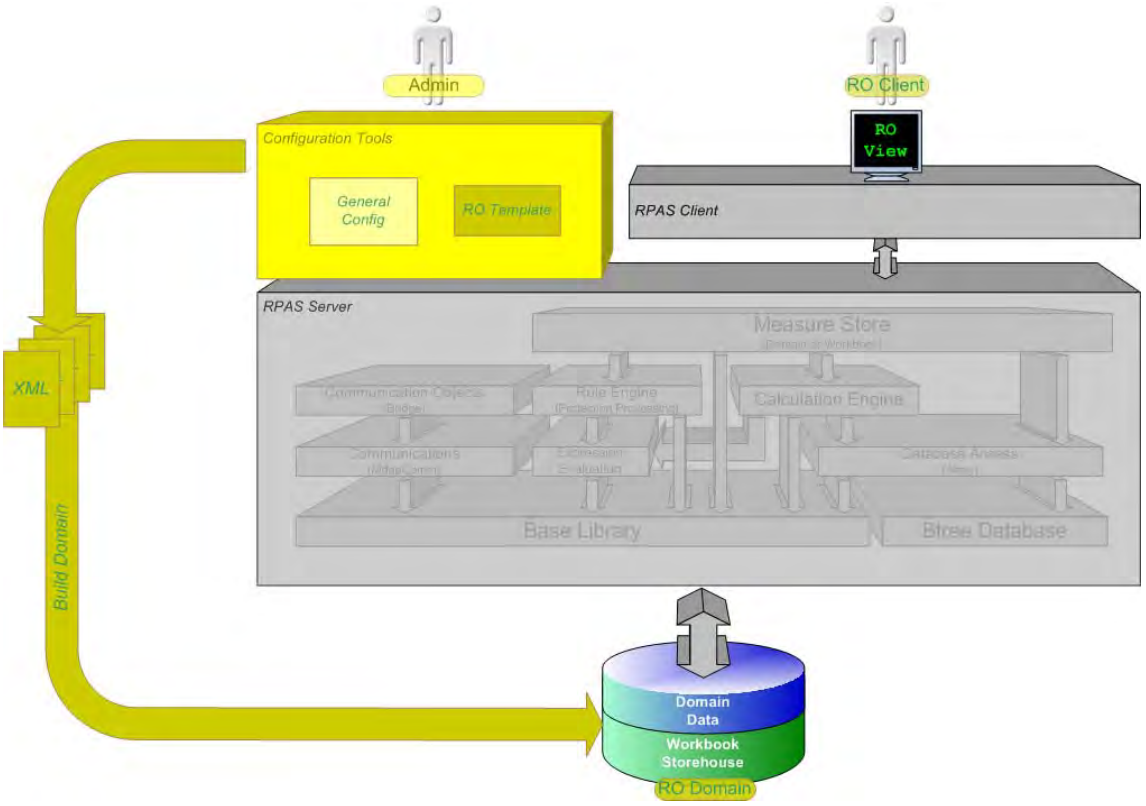


Figure 1–1 describes the RO template application. In the truest sense, RO and other templates are not applications in the same way that the RPAS client is an application, as end users are not presented a user interface specific to the template. The RO and other templates are the predefined means to view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

Full Mode Optimization Batch Process for Item/Store Categories

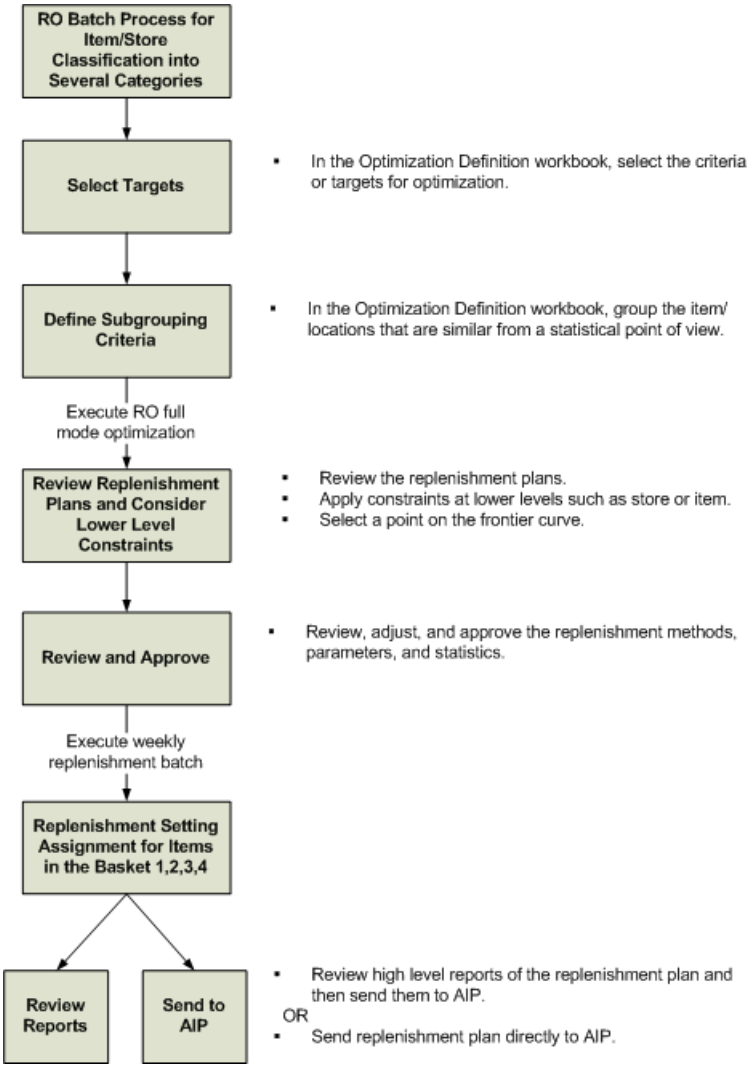
The RO batch process divides all Item/Stores into the following categories.

Table 1–1 Item/Store Categories Full Mode Optimization

Item/Store Category	Process Description
Item/Store with sparse low sales year round with short lead time and review time	These Item/Stores are assigned a min/max replenishment scenario with an order points of 1 and order up to level of 1. These Item/Stores are not included in the full optimization batch.
Seasonal Item/Stores that are off-season in the next few replenishment periods	These Item/Stores are assigned a min/max replenishment scenario with an order points of 1 and order up to level of 1. These Item/Stores are not included in the full optimization batch.
New Item/Stores with like-item and without simulation results, and enough sales history	These Item/Stores are not included in the full optimization. They receive the replenishment settings of their like-items.
New Item/Stores without like-item, simulation results, and enough sales history	These Item/Stores are not included in the full optimization because their sales pattern is not considered stable. These Item/Stores are assigned to an RO subgroup based on their statistics and inherit that subgroup's recommended scenarios.
Item/Stores with enough sales history but no simulation results	These Item/Stores are included in the full mode optimization because their sales pattern is considered stable. These Item/Stores are assigned to an APC group to inherit the APC group's simulation results and use these results in the optimization matrice calculation.
Item/Stores with simulation results and significant sales pattern change	These Item/Stores are included in the optimization but their sales pattern is changed and thus their simulation result at Item/Store is invalid. These Item/Stores are assigned to an APC group to inherit the APC group's simulation results and use these results in the optimization matrice calculation.
Regular Item/Stores	These Item/Stores participate in the full mode optimization.

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

Follow these steps to 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.

Refresh Mode Batch Process for Item/Store Categories

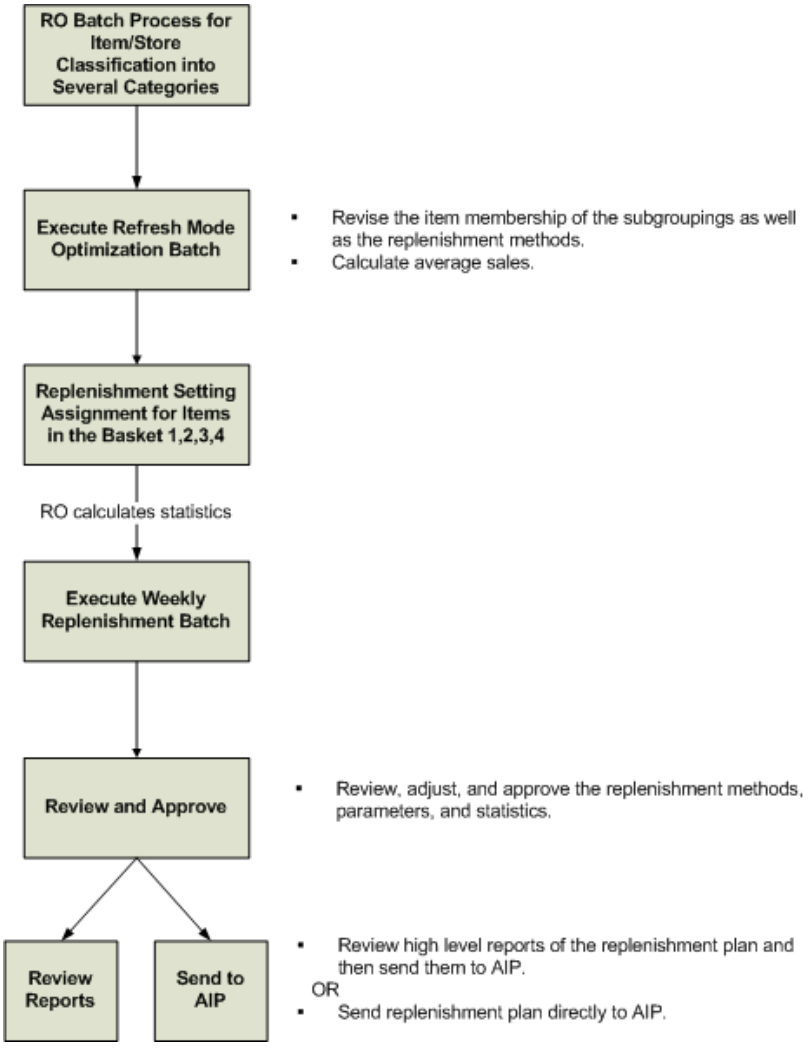
The RO batch process divides all Item/Stores into the following categories.

Table 1–2 Item/Store Categories Refresh Mode

Item/Store Category	Process Description
Item/Store with sparse low sales year round with short lead time and review time	These Item/Stores are assigned a min/max replenishment scenario with an order points of 1 and order up to level of 1. These Item/Stores are not included in the refresh mode optimization batch.
Seasonal Item/Stores that are off-season in the next few replenishment periods	These Item/Stores are assigned a min/max replenishment scenario with an order points of 1 and order up to level of 1. These Item/Stores are not included in the refresh mode optimization batch.
New Item/Stores with like-item and without simulation results, and enough sales history	These Item/Stores are not included in the refresh mode optimization. They receive the replenishment settings of their like-items.
New Item/Stores without like-item, simulation results, and enough sales history	These Item/Stores are not included in the refresh mode optimization because their sales pattern is not considered stable. These Item/Stores are assigned to an RO subgroup based on their statistics and inherit that subgroup's recommended scenarios.
Item/Stores with enough sales history but no simulation results	These Item/Stores are included in the refresh mode optimization because their sales pattern is considered stable. These Item/Stores are assigned to an APC group to inherit the APC group's simulation results and use these results in the optimization matrice calculation.
Item/Stores with simulation results and significant sales pattern change	These Item/Stores are included in the optimization but their sales pattern is changed and thus their simulation result at Item/Store is invalid. These Item/Stores are assigned to an APC group to inherit the APC group's simulation results and use these results in the optimization matrice calculation.
Regular Item/Stores	These Item/Stores participate in the refresh mode optimization.

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

Follow these steps to 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

4. 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.

5. 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

6. 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

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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.

Lost sales history is needed to calculate the current service level. If it is not available, then RDF's preprocessing functions may be used to provide the lost sales estimation if the stock out history is available.

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.

RO optimization batch is run under each subdomain. The items that need to be optimized together need to be under the same subdomain

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 or 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* or the *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 "Plug-in Generated RO Internal Data Files" and 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 *Oracle Retail Predictive Application Server Configuration Tools User Guide*.

Batch Scheduling

Batch scripts are lists of commands or jobs run 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* or the *Oracle Retail Predictive Application Server Administration Guide for the Fusion client*.

Internationalization

For more information on translation for RO, see Chapter 8, "Internationalization".

3

Build Scripts

This chapter describes the set up that must be done before building the RO domain and the batch scripts that must be run 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
<ro_directory>/domain/RO_NTIER	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. Run the `buildRO.sh` script:

   ```
   ./buildRO.sh
   ```

> **Note:** The `buildRO.sh` does not support using `globaldomainconfig.xml` to build a global domain. It must be modified in order to use `globaldomainconfig.xml`.

The first time `buildRO.sh` is run, 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 HPUX.

  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

Optional Environment Variable

Define and reset the value for the following environment variable to increase memory allocation to a Java virtual machine within an RPAS process:

RPAS_JAVA_MAXHEAPSIZE

If this environment variable is not defined, it defaults to 256MB. If experiencing memory issues, you can define it to increase memory allocation to a Java virtual machine within an RPAS process. Although you can increase the value up to 1024MB, it is suggested to first set it up to 512MB.

```
export RPAS_JAVA_MAXHEAPSIZE=1024MB
```

Files Needed to Build the RO Domain

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

- Standard RPAS Hierarchy Files
- RO Hierarchy Files
- Required Data Files for Store Optimization
- Required Data Files for Warehouse Optimization
- Plug-in Generated RO Internal 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

Table 3–1 (Cont.) Calendar Hierarchy Fields

Field	Description
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 3–1 Calendar Hierarchy

```
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

Table 3–2 (Cont.) Product Hierarchy Fields

Field	Description
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 3–2 Product Hierarchy

```
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

Table 3–3 (Cont.) Location Hierarchy Fields

Field	Description
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 3–3 Location Hierarchy

```
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 3–4 Warehouse Hierarchy

```
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

Note: The KEK and PI hierarchy files are now generated by the RO plug-in.

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 3–5 Subgroup Hierarchy

```
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 3–6 Store APC Group Hierarchy

```
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 3–7 Warehouse Group Hierarchy

```
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 3–8 Store Scenario Hierarchy

```
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

Table 3–9 (Cont.) Warehouse Scenario Hierarchy Fields

Field	Description
WSNO label	Warehouse Scenario label

Example 3–9 Warehouse Scenario Hierarchy

```
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 3–10 Frontier Data Point Hierarchy

```
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 3–11 Break Point Hierarchy

```
08, break point 8
09, break point 9
```

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 3–12 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_oousr.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
Like SKU	likeskusr.csv.ovr	Item/Store Optional	769,10772144,10772143
Like Store	likestrsr.csv.ovr	Item/Store Optional	769,10772144,777
New Item on Sale Date	onsaledatesr.csv.ovr	Item/Store Optional	769,10772144,20040506

Measures from a Demand Forecasting Application for Store Optimization

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

Table 3–13 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
Weekly seasonal index	Wklyseasindexsr.csv.ovr	Itemstr_week Optional	W01_2009,769,10772144,1.1
Dow of Week profile	dowprofilesr.csv.ovr	Itemstr_dow_ optional	Fri,769,10772144,0.2

Measures for AIP Integration

These measures must be loaded into the RO domain and be in sync with the integration hierarchy data prior to running 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 3–14 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 3–15 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

Table 3–15 (Cont.) Measures from APC RO for Store Optimization

Name	Filename
Store APC group	
APC group lower bound for group factor1	apclowerbound1sr.csv.ovr
APC group upper bound for group factor 1	apcupperbound1sr.csv.ovr
APC group lowerbound for group factor 2	apclowerbound2sr.csv.ovr
APC group upperbound for group factor 2	apcupperbound2sr.csv.ovr
APC group lower bound for group factor 3	apclowerbound3sr.csv.ovr
APC group upper bound for group factor 3	apcupperbound3sr.csv.ovr
APC group lower bound for group factor 4	apclowerbound4sr.csv.ovr
APC group upper bound for group factor 4	apcupperbound4sr.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	
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

Measures for Store Optimization Setup

Table 3–16 lists information about the Store Optimization setup measures.

Table 3–16 Measures for Store Optimization Setup

Measure	Description	Rule Group
GwksForStsSr	The number of weeks used in sales statistics calculation. This measure is based on item/store and defaults to 52. The history window for sales statistics calculation is from today-GwksForStsSr to today-1.	
GfrcstHorznSr	The number of weeks that have forecast. This measure is based on item/store and defaults to 13. The future window for projected inventory calculation is from today to today+GfrcstHorznSr-1.	
wklydemandusr	The sales used in RO calculation. This measure is based on item/store/week and defaults to the sum of actsalsr+clonesalsr.	These measures are calculated in the rule group of custdatasr. This rule group shall be invoked after each data load. This rule group is hosted in the ROCommon solution and can be modified by an implementor. The modification will not be overridden by the RO plug-in.
activemskissr	A boolean measure based on item/store. It indicates if a item/store will be included in optimization process and receives a system recommended replenish scenrio. It is set to true if the total sales units in the history window for sales statistics calculation is larger than zero.	
grpfactor1sl	The first grouping factor measure at item/store. By default, RO populates this measure with average sales in history window for sales statistics.	These measures are calculated in the rule group of custgrpfactorsl. This rule group was invoked in the RO optimization batch script. This rule group is hosted in the ROCommon solution can be modified by implementor. The modification will not been overridden by the RO plug-in.
grpfactor2sl	The second grouping factor measure at item/store. By default, RO populates this measure with sales variability in history window for sales statistics.	
grpfactor3sl	The third grouping factor measure at item/store. It defaults to 0.	
grpfactor4sl	The fourth grouping factor measure at item/store. It defaults to 0.	
equalmatrixsl	The equalizing matrix measure is based on item/store and used in grouping to balance out each group. RO populates this measure with total sales units in the history window for sales statistics. That ensures each subgroup have roughly the same amount of total sales units.	

Table 3–16 (Cont.) Measures for Store Optimization Setup

Measure	Description	Rule Group
sglgrpfactor1sl	Subgroup look up grouping factor one measure at item/store. It should be populated using the same criteria as grpfactor1sl only for the items in basket 4 (new items/stores without like SKU assignment but has enough sales history).	These measures are calculated in the rule group of custgrpfactorsl.
sglgrpfactor2sl	Subgroup look up grouping factor two measure at item/store. It should be populated using the same criteria as grpfactor1sl only for the items in basket 4 (new items/stores without like SKU assignment but has enough sales history).	
sglgrpfactor3sl	Subgroup look up grouping factor three measure at item/store. It should be populated using the same criteria as grpfactor1sl only for the items in basket 4 (new items/stores without like SKU assignment but has enough sales history).	
slgrpfactor4sl	Subgroup look up grouping factor four measure at item/store. It should be populated using the same criteria as grpfactor1sl only for the items in basket 4 (new items/stores without like SKU assignment but has enough sales history).	
optweightsl	This measure is based on optimization intersection + subgroup. It is based on pgrp/comp/subgroup. It is a weighting factor on each subgroup for optimization. This measure is set to 1.	
apcgrpfactor1sl	The first APC grouping factor measure at item/store. By default, RO populates this measure with average sales in history window for sales statistics.	These measures are calculated in the rule group of custagrpfactorsl. This rule group was invoked in the RO optimization batch script. This rule group is hosted in the ROCommon solution and can be modified by an implementor. The modification will not been overridden by the RO plug-in.
apcgrpfactor2sl	The second APC grouping factor measure at item/store. By default, RO populates this measure with sales variability in history window for sales statistics.	
apcgrpfactor3sl	The third APC grouping factor measure at item/store. By default, RO populates this measure with leadtime.	
apcgrpfactor4sl	The fourth APC grouping factor measure at item/store. By default, RO populates this measure with leadtime.	

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
- Measures from a Demand Forecasting Application for Warehouse Optimization
- Measures from APC RO for Warehouse Optimization

Measures from a Merchandising or Replenishment System for Warehouse Optimization

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

Table 3–17 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
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
Like SKU	likeskuwh.csv.ovr	Item/Warehouse Optional	769,10772144,10772143
Like Store	likestrwh.csv.ovr	Item/Warehouse Optional	769,10772144,777
New Item on Sale Date	onsaledatewh.csv.ovr	Item/Warehouse Optional	769,10772144,20040506

Measures from a Demand Forecasting Application for Warehouse Optimization

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

Table 3–18 Measures from a Demand Forecasting Application for Warehouse Optimization

Name	Filename	Required/Optional	Example
Item/warehouse/week			
Weekly forecast	wklyfcstuwh.csv.ovr	Required	20091231,12,10772144,500.00
Weekly cumint	wklycumintwh.csv.ovr	Required	20091231,12,10772144,750.00
Weekly seasonal index	Wklyseasindexwh.csv.ovr	Itemstr_week Optional	W01_2009,769,10772144,1.1
Dow of Week profile	dowprofilewh.csv.ovr	Itemstr_dow_ optional	Fri,769,10772144,0.2

Measures from APC RO for Warehouse Optimization

Table 3–19 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 lower bound for group factor1	apclowerbound1wh.csv.ovr
APC group upper bound for group factor 1	apcupperbound1wh.csv.ovr
APC group lower bound for group factor 2	apclowerbound2srwh.csv.ovr
APC group upper bound for group factor 2	apcupperbound2wh.csv.ovr
APC group lower bound for group factor 3	apclowerbound3wh.csv.ovr
APC group upper bound for group factor 3	apcupperbound3wh.csv.ovr
APC group lower bound for group factor 4	apclowerbound4wh.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
Wastage	simwastegswh.csv.ovr
Stockouts	stkoutnmgswh.csv.ovr
Item/warehouse/warehouse scenario	
Service level	servlevelisswh.csv.ovr
Simulated average demand	simavgdmndisswh.csv.ovr

Table 3–19 (Cont.) Measures from APC RO for Warehouse Optimization

Name	Filename
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

Plug-in Generated RO Internal Data Files

The RO plug-in is modified so that the RO internal data files are generated outside of the domain building process. Prior to domain build, `execplugin.sh` is invoked to generate the RO internal data files based on configuration decisions. An RO domain needs to be patched and an extra step is needed to copy the generated files into the input folder of the patched domain.

The following server script is required for plug-in task architecture:

```
execPluginTask.sh RO:com.retek.labs.ro.plugin.installer.ROPosGenerator
"${configDir}/RO_NTIER/RO_NTIER.xml" "$inputDir"
```

This script automatically creates several hierarchies and measures necessary for an RO domain:

- `baselvlint.csv.ovr`
- `baselvls.csv.ovr`
- `optlvlint.csv.ovr`
- `bslv.csv.dat`
- `optl.csv.dat`
- gw_val.csv.ovr
- gz_val.csv.ovr
- gmean_sls_ind.ovr
- gpi_val.ovr

Measures for Warehouse Optimization Setup

Table 3–20 lists information about the Warehouse Optimization setup measures.

Table 3–20 Measures for Warehouse Optimization Setup

Measure	Description	Rule Group
GwksForStsWh	The number of weeks used in sales statistics calculation. This measure is based on item/warehouse and defaults to 52. The history window for sales statistics calculation is from today-GwksForStsWh to today-1.	
GfrcstHorznWh	The number of weeks that have forecast. This measure is based on item/warehouse and defaults to 13. The future window for projected inventory calculation is from today to today+GfrcstHorznWh-1.	
wklydemandusr	The sales used in RO calculation. This measure is based on item/warehouse/week and defaults to the sum of actsalsr+clonesalsr.	These measures are calculated in the rule group of custdatasr. This rule group shall be invoked after each data load. This rule group is hosted in the ROCommon solution and can be modified by an implementor. The modification will not be overridden by the RO plug-in.
activemskissr	A boolean measure based on item/warehouse. It indicates if a item/warehouse will be included in optimization process and receives a system recommended replenish scenrio. It is set to true if the total sales units in the history window for sales statistics calculation is larger than zero.	
grpfactor1wl	The first grouping factor measure at item/warehouse. By default, RO populates this measure with average sales in history window for sales statistics.	These measures are calculated in the rule group of custgrpfactorwl. This rule group was invoked in the RO optimization batch script. This rule group is hosted in the ROCommon solution can be modified by implementor. The modification will not been overridden by the RO plug-in.
grpfactor2wl	The second grouping factor measure at item/warehouse. By default, RO populates this measure with sales variability in history window for sales statistics.	
grpfactor3wl	The third grouping factor measure at item/warehouse. It defaults to 0.	
grpfactor4wl	The fourth grouping factor measure at item/warehouse. It defaults to 0.	
equalmatrixwl	The equalizing matrix measure is based on item/warehouse and used in grouping to balance out each group. RO populates this measure with total sales units in the history window for sales statistics. That ensures each subgroup have roughly the same amount of total sales units.	

Table 3–20 (Cont.) Measures for Warehouse Optimization Setup

Measure	Description	Rule Group
sglgrpfactor1wl	Subgroup look up grouping factor one measure at item/warehouse. It should be populated using the same criteria as grpfactor1wl only for the items in basket 4 (new items/warehouses without like SKU assignment but has enough sales history).	These measures are calculated in the rule group of custgrpfactorwl.
sglgrpfactor2wl	Subgroup look up grouping factor two measure at item/warehouse. It should be populated using the same criteria as grpfactor1wl only for the items in basket 4 (new items/warehouses without like SKU assignment but has enough sales history).	
sglgrpfactor3wl	Subgroup look up grouping factor three measure at item/warehouse. It should be populated using the same criteria as grpfactor1wl only for the items in basket 4 (new items/warehouses without like SKU assignment but has enough sales history).	
wlgrpfactor4wl	Subgroup look up grouping factor four measure at item/warehouse. It should be populated using the same criteria as grpfactor1wl only for the items in basket 4 (new items/warehouses without like SKU assignment but has enough sales history).	
optweightwl	This measure is based on optimization intersection + subgroup. It is based on pgrp/comp/subgroup. It is a weighting factor on each subgroup for optimization. This measure is set to 1.	
apcgrpfactor1wl	The first APC grouping factor measure at item/warehouse. By default, RO populates this measure with average sales in history window for sales statistics.	These measures are calculated in the rule group of custagrpfactorwl. This rule group was invoked in the RO optimization batch script. This rule group is hosted in the ROCommon solution and can be modified by an implementor. The modification will not been overridden by the RO plug-in.
apcgrpfactor2wl	The second APC grouping factor measure at item/warehouse. By default, RO populates this measure with sales variability in history window for sales statistics.	
apcgrpfactor3wl	The third APC grouping factor measure at item/warehouse. By default, RO populates this measure with leadtime.	
apcgrpfactor4wl	The fourth APC grouping factor measure at item/warehouse. By default, RO populates this measure with leadtime.	

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* or the *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* or the *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 rule groups listed in the following sections.

Store Optimization Rule Groups

- 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_dataloadSr
- post_dataloadSr need to be run from each sub domain
- Set the environment variable RPAS_TODAY to the first day without sales if sales is not loaded up to current

Example 3–12 Setting RPAS_TODAY for Stores

```
Export RPAS_TODAY=20130101 if the domain only has sales data for the year 2012.
mace -d $SUB_DOMAIN -run-group custdataSr
custdataSr needs to be run from each sub domain
```

Warehouse Optimization Rule Groups

- 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_dataloadWh

- post_dataloadWh need to be run from each sub domain
- Set the environment variable RPAS_TODAY to the first day without sales if sales is not loaded up to current

Example 3–13 Setting RPAS_TODAY for Warehouse

```
Export RPAS_TODAY=20130101 if the domain only has sales data for the year 2012.
mace -d $SUB_DOMAIN -run-group custdataWh
custdataWh needs 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 3–21.

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 3–21 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 or the *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* or the *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 run before an old domain can be patched to Release 13.3.

> **Note:** For additional information about upgrading RO to a 14.1.3 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 14.1.3.

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*.

4

Integration

This chapter describes the following information:

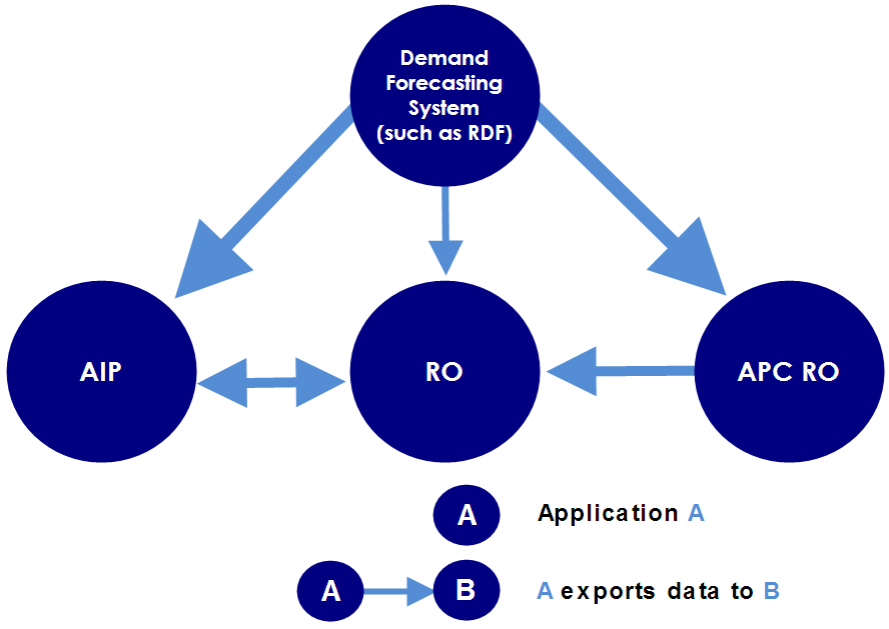
- Overview of the Integrated Inventory Planning Suite
- Overview of the Analytic Parameter Calculator for Replenishment Optimization (APC RO) and RO Integration
- Integration Configuration
- Export to Merchandise System

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

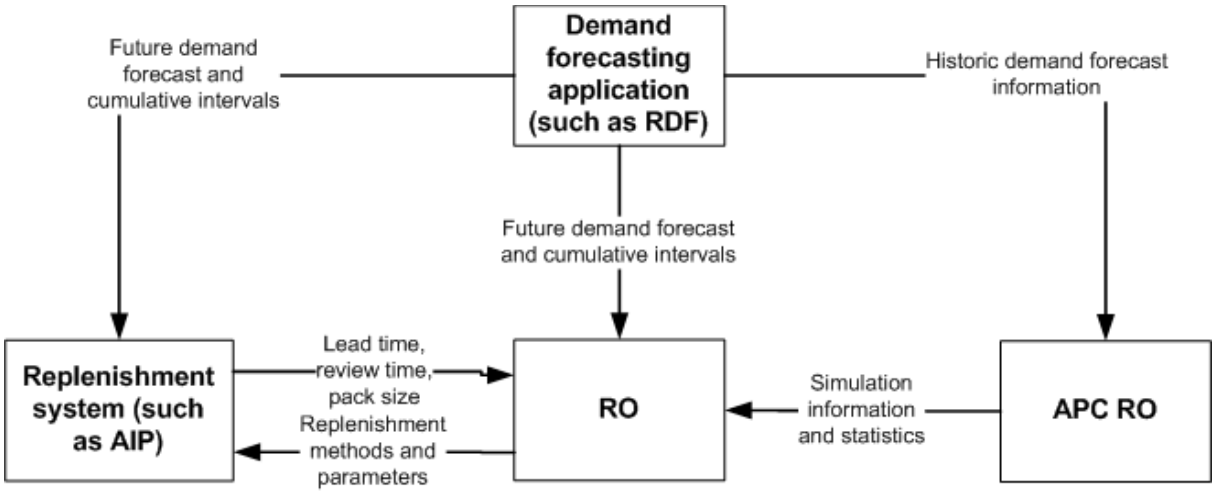


This solution supports data sharing among these applications. Note that the data sharing functionality is not dependent on the presence of all these applications. The defined data sharing between any of the applications works for the entire suite as well as for a subset of the applications.

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 Figure 4–2 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

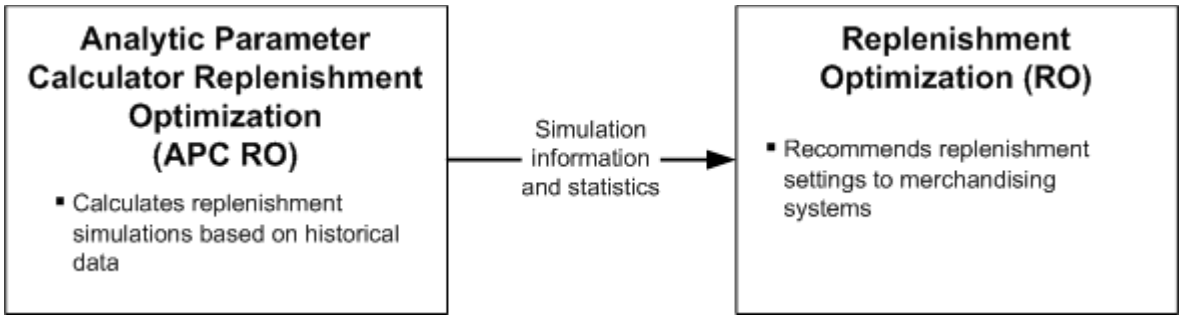
Analytic Parameter Calculator for Replenishment Optimization (APC RO) is an analytical, fact-based application that uses a client's historical sales patterns to perform replenishment simulations and calculate statistics. RO uses the APC RO results to make optimal replenishment recommendations based on 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
- APC grouping level information
- APC grouping/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	wosisssr.csv.ovr
Store Service Level Data	servlevelisssr.csv.ovr
Store Lead Time Data	gleadtimesr.csv.ovr
Store Simulated Average Demand Data	simavgdmndisssr.csv.ovr
Store Average Order Frequency Data	avgordfrqiss.csv.ovr
Store Average Order Size Data	avgordsizisssr.csv.ovr
Store Number of Stock-outs Data	stkoutnmisssr.csv.ovr
Store Average Simulated OUTL Data	simavgoutlisssr.csv.ovr
Store Average Simulated OP Data	simavgopisssr.csv.ovr
Store Average Wastage Data	simwasteisssr.csv.ovr

APC Grouping Level Information

Table 4–2 APC Grouping Level Data Files

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

APC Grouping/Scenario Level Information

Table 4–3 APC 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	whssimdmdgwsr.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 listed 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: ■ .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

Perform the following steps 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 listed in the next table, **-purgeAge 0** is only necessary when the previous positions along the dimension needs to be wiped out. Otherwise, do not use **-purgeAge 0**.

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

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

Example 4–1 Load APC RO Measure Data Files

```
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 Designs
- RO Stores Data Mapping
- RO Warehouse Data Mapping
- Batch Logs and Settings

Setting Environment Variables

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

ro_environment.sh

The variables listed 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.

Table 4–5 (Cont.) Environment Variables

Environment Variable	Description
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.
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 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 in Table 4–6.

Path: `$RPAS_HOME/applib/resources`

AIP Import/Export Data Paths

The import/export data path is the same for all the integration scripts listed in Table 4–6.

Path: `$RO_DOMAIN/interface/aip`

RO Stores Data Mapping

The following mapping data is for stores only.

Output Measure Data

Table 4–7 displays the measure files that RO sends to AIP.

Table 4–7 Output Measure Data

File Name	Data Elements
STR_MINMAX	■ Store Min Stock ■ Store Max Stock ■ Store Replenishment Method
STR_DYNAMIC	■ Store Service Level ■ Store Inventory Selling Days ■ Store Replenishment Method
STR_TIMESUPPLY	■ Store Min Time Supply Days ■ Store Max Time Supply Days ■ Store Time Supply Horizon ■ Store Replenishment Method
STR_HYBRID	■ Store Min Time Supply Days ■ Store Inventory Selling Days ■ Store Replenishment Method
STR_POISSON	■ 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

Table 4–8 displays the measure files AIP creates for RO.

Table 4–8 Input Measure Data

File Name	Data Elements
STR_AIP_DATA	▪ Lead Time ▪ Review Time ▪ Pack Size

RO Warehouse Data Mapping

The following mapping data is for warehouses only.

Output Measure Data

Table 4–9 displays the measure files that RO sends to AIP.

Table 4–9 Output Measure Data

File Name	Data Elements
WH_MINMAX	▪ Warehouse Min Stock ▪ Warehouse Max Stock ▪ Warehouse Replenishment Method
WH_DYNAMIC	▪ Warehouse Service Level ▪ Warehouse Inventory Selling Days ▪ Warehouse Replenishment Method
WH_TIMESUPPLY	▪ Warehouse Min Time Supply Days ▪ Warehouse Max Time Supply Days ▪ Warehouse Time Supply Horizon ▪ Warehouse Replenishment Method
WH_HYBRID	▪ 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

Table 4–10 displays the measure files AIP creates for RO.

Table 4–10 Input Measure Data

File Name	Data Elements
WH_AIP_DATA	▪ 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.

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

5

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

Figure 5–1 CLND hierarchy in the RO Configuration

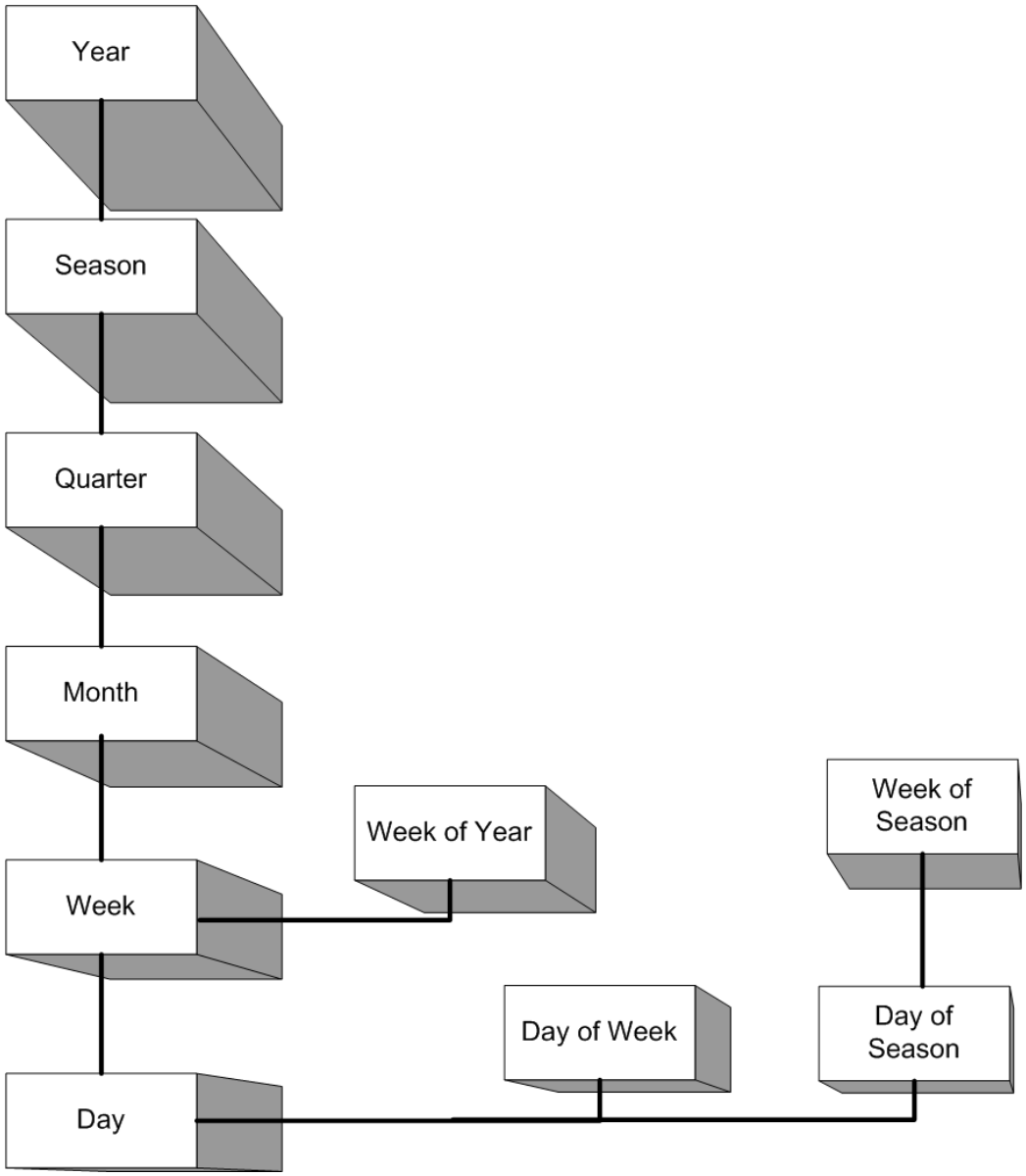


Table 5–1 CLND Hierarchy in the RO Configuration

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

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

Name	Label	Hierarchy Type	Child
WOY	Week of Year	Alternate	WEEK
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

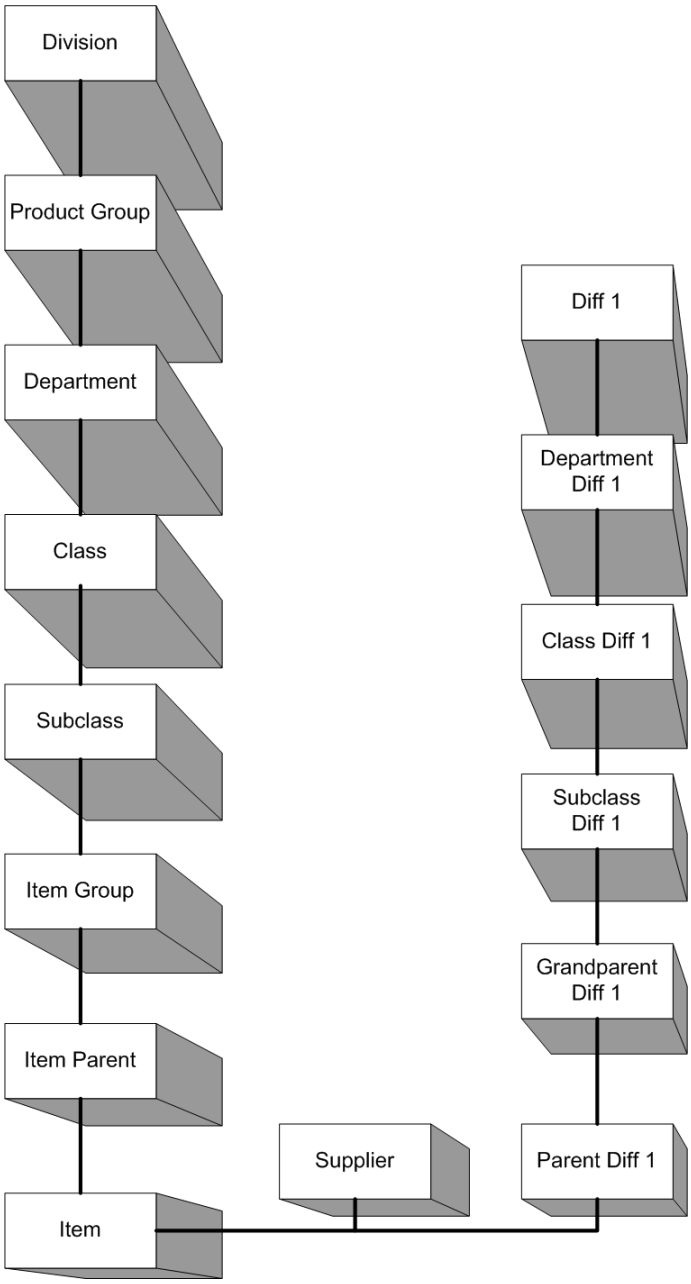


Table 5–2 PROD Hierarchy in the RO Configuration

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

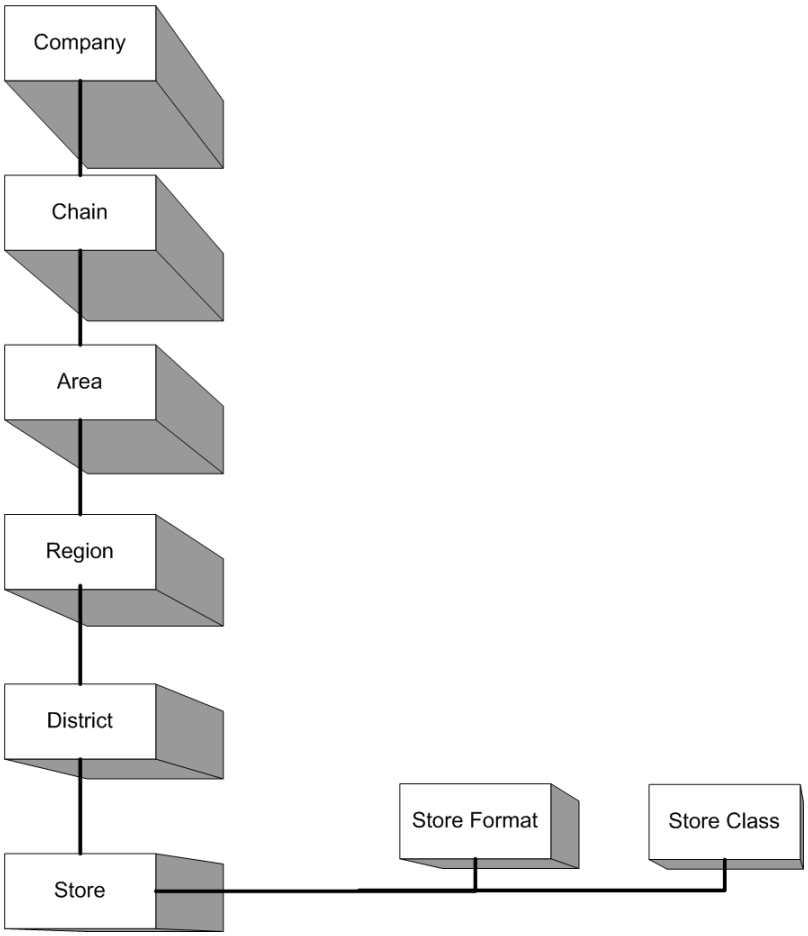


Table 5–3 LOC hierarchy in the RO configuration

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 maximum number of frontier data points ever needed in a calculation = (maximum scenario number -1) * maximum subgroup number. This hierarchy contains one dimension: frontier data points.

It is an art to decide how many positions is necessary on the frontier data point dimension. The optimization will need the total number of frontier scenarios per subgroup to store the results. An out of range exception will be throw by optimization batch if the dimension length is less than that number. Too many unused positions on the frontier data point dimension will slow down batch performance. Frontier scenarios per subgroup are the selected scenarios to participate optimization. It is challenging to decide how many frontier scenario exists without knowledge of subgroup level optimization matrices. The guideline is to assume that only 50% of scenarios will be frontier scenarios and multiply that with the number of subgroups. Use that as the starting point to modify the hierarchy file. Only after the RO domain is built and the optimization batch is run, can you observe the generated frontier curve and batch performance to decide how many positions should the frontier data point dimension have.

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

Note: The KEK hierarchy file is generated by the RO plug-in.

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

Note: The PI hierarchy file is generated by the RO plug-in.

6

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

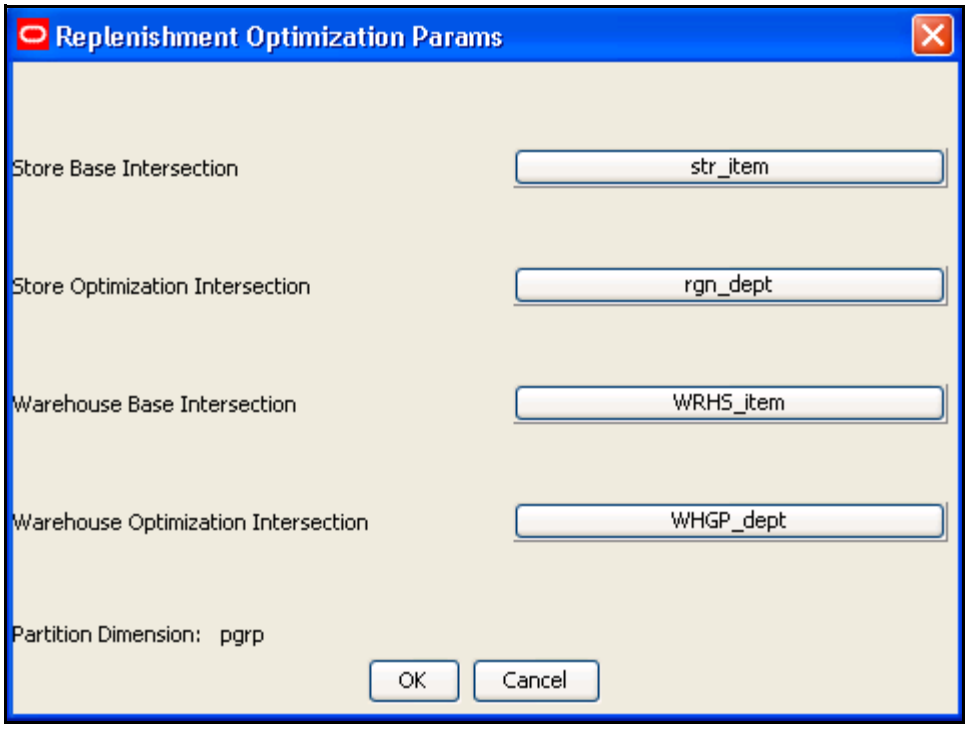


Table 6–1 describes the fields in this window.

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	Displays the base and optimization level intersections for stores and warehouses. Click theses buttons to open its Select Intersection window. The data is available from these buttons: ■ 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. 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*.

7

Batch Processing

This chapter contains all the scripts that are needed to run 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* or the *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

The `ro_optbatch_str.ksh` script 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}] [-noparallel | -maxprocesses {n}]
```

ro_optbatch_wh.ksh

The `ro_optbatch_wh.ksh script` 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}] [-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.

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

The `ro_optbatch_str_localdomain.ksh` script 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

The `ro_optbatch_wh_localdomain.ksh` script 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

The `ro_replbatch_str.ksh` script 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

The `ro_replbatch_wh.ksh` script 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

The `ro_replbatch_str_localdomain.ksh` script 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

The `ro_replbatch_wh_localdomain.ksh` script 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

The `ro_reportbatch_str.ksh` script 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

The `ro_reportbatch_wh.ksh` script 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}] [-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.

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

The `ro_reportbatch_str_localdomain.ksh` script 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

The `ro_reportbatch_wh_localdomain.ksh` script 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.

8

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*.