

**Oracle® Retail Clearance Optimization Engine**

Configuration Guide

Release 14.0

**E50205-01**

December 2013

Copyright © 2013, Oracle and/or its affiliates. All rights reserved.

Primary Author: Anshuman Accanoor

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

#### **Value-Added Reseller (VAR) Language**

##### **Oracle Retail VAR Applications**

The following restrictions and provisions only apply to the programs referred to in this section and licensed to you. You acknowledge that the programs may contain third party software (VAR applications) licensed to Oracle. Depending upon your product and its version number, the VAR applications may include:

- (i) the **MicroStrategy** Components developed and licensed by MicroStrategy Services Corporation (MicroStrategy) of McLean, Virginia to Oracle and imbedded in the MicroStrategy for Oracle Retail Data Warehouse and MicroStrategy for Oracle Retail Planning & Optimization applications.
- (ii) the **Wavelink** component developed and licensed by Wavelink Corporation (Wavelink) of Kirkland, Washington, to Oracle and imbedded in Oracle Retail Mobile Store Inventory Management.
- (iii) the software component known as **Access Via**™ licensed by Access Via of Seattle, Washington, and imbedded in Oracle Retail Signs and Oracle Retail Labels and Tags.
- (iv) the software component known as **Adobe Flex**™ licensed by Adobe Systems Incorporated of San Jose, California, and imbedded in Oracle Retail Promotion Planning & Optimization application.

You acknowledge and confirm that Oracle grants you use of only the object code of the VAR Applications. Oracle will not deliver source code to the VAR Applications to you. Notwithstanding any other term or condition of the agreement and this ordering document, you shall not cause or permit alteration of any VAR Applications. For purposes of this section, "alteration" refers to all alterations, translations, upgrades, enhancements, customizations or modifications of all or any portion of the VAR Applications including all reconfigurations, reassembly or reverse assembly, re-engineering or reverse engineering and recompilations or reverse compilations of the VAR Applications or any derivatives of the VAR Applications. You

acknowledge that it shall be a breach of the agreement to utilize the relationship, and/or confidential information of the VAR Applications for purposes of competitive discovery.

The VAR Applications contain trade secrets of Oracle and Oracle's licensors and Customer shall not attempt, cause, or permit the alteration, decompilation, reverse engineering, disassembly or other reduction of the VAR Applications to a human perceivable form. Oracle reserves the right to replace, with functional equivalent software, any of the VAR Applications in future releases of the applicable program.



---

---

# Contents

<b>Send Us Your Comments</b> .....	ix
<b>Preface</b> .....	xi
Audience .....	xi
Documentation Accessibility .....	xi
Related Documents .....	xi
Customer Support .....	xii
Review Patch Documentation .....	xii
Improved Process for Oracle Retail Documentation Corrections .....	xii
Oracle Retail Documentation on the Oracle Technology Network .....	xiii
Conventions .....	xiii
<b>1 Getting Started</b>	
<b>About Clearance Optimization Engine</b> .....	1-1
<b>Getting Started with COE</b> .....	1-3
<b>Getting Started with Configuring COE</b> .....	1-3
Configuration Process .....	1-4
<b>COE Required Skill Sets</b> .....	1-4
<b>Change Management</b> .....	1-6
Implementing and Deploying Changes .....	1-6
<b>Applying Patches</b> .....	1-7
<b>2 User Management</b>	
<b>Introduction</b> .....	2-1
<b>About User Roles and User Actions</b> .....	2-1
About User Management Roles .....	2-3
<b>User Management Bulk Loader Utility</b> .....	2-4
Users and Roles .....	2-4
The XML Files .....	2-5
Standard Load Prerequisites .....	2-5
Shell Script .....	2-5
<b>User Management Security</b> .....	2-6
<b>Setting Up the Password Policies and Account Lockouts</b> .....	2-6
<b>Clearance Optimization Engine Sample XML Files</b> .....	2-6
User Sample XML File .....	2-6

Roles Sample XML File.....	2-7
Role Assignment XML Sample File.....	2-8

### 3 Business Rule Property Manager

<b>Introduction</b> .....	3-1
<b>Getting Started</b> .....	3-2
<b>Default Business Rules</b> .....	3-2
<b>Business Rule Definitions</b> .....	3-6
<b>Loading Business Rule Definitions</b> .....	3-8
<b>Configuring Business Rule Definitions</b> .....	3-9
<b>Business Rule Instances</b> .....	3-9
Guidelines for Entering Business Rule Instances .....	3-9
<b>Custom Attributes</b> .....	3-9
<b>Business Rules and Inference Rules</b> .....	3-10
<b>Business Rule Property Manager Bulk Loader</b> .....	3-11
Business Rule Instances Standard Interface Specification (ASH_BRM_INSTANCE_TBL) .	3-11
Loading Instances.....	3-11
<b>Business Rule Property Manager Properties</b> .....	3-12
Guidelines for Setting BRPM Properties.....	3-13
<b>Business Rule Property Manager Grid Configuration</b> .....	3-13
Example Configuration .....	3-14

### 4 Inference Rules

<b>Introduction</b> .....	4-1
<b>Inference Rule Access</b> .....	4-2
Performance Tuning Recommendations .....	4-3
<b>Inference Rules Overview</b> .....	4-3
Inference Rule Descriptions.....	4-5

### 5 What If Engine Service Call

<b>Introduction</b> .....	5-1
<b>Configuring the RMI Server</b> .....	5-1
Starting the RMI Server and Registry .....	5-1
Port and Host Configuration.....	5-2
<b>What If and Pricing Groups</b> .....	5-2
<b>What If Size Limitations</b> .....	5-3
Configuring p4pgui config.properties .....	5-3
<b>What If and the Database</b> .....	5-3
Database Tables .....	5-3
<b>What If and Inference Rules</b> .....	5-5
How What If Affects Inference Rules.....	5-5
Inference Rule Dependencies for What If.....	5-6

### 6 Internationalization

<b>Introduction</b> .....	6-1
<b>Translation</b> .....	6-1

<b>Files</b> .....	6-2
Translated Files.....	6-2
Directory Structure .....	6-3
<b>Configuration Settings</b> .....	6-3
<b>Formatting for Internationalization</b> .....	6-4
Currency .....	6-4
Format Patterns .....	6-5
Number Format Patterns .....	6-5
Currency Format Patterns .....	6-5
Date Format Patterns.....	6-5
Number Separators.....	6-6
formats.properties .....	6-7
<b>7 Pricing Group Management</b>	
<b>Introduction</b> .....	7-1
<b>Load Procedures</b> .....	7-2
LoadCollectionsAuto.....	7-2
<b>Inference Rule Configuration</b> .....	7-2
Example Configurations .....	7-2
IR_ITEM_COLLECTION .....	7-2
Chain-Level Pricing Groups.....	7-3
Redefining Pricing Groups .....	7-3
<b>8 Flexible Store Clustering</b>	
<b>Introduction</b> .....	8-1
<b>Technical Details</b> .....	8-1
<b>9 The UI Configuration</b>	
<b>Introduction</b> .....	9-1
<b>Service Level Configuration Files</b> .....	9-1
<b>Configuring the Screens</b> .....	9-2
Configuring a Sample Screen .....	9-2
Identifying the Application Screen Metrics.....	9-3
Identifying the Data Source .....	9-3
Creating Columns .....	9-3
Configuring p4p-maint-grid-groups.xml .....	9-4
Configuring gridResources.properties .....	9-4
Configuring the Grid Features .....	9-4
Specifying Other Grid Attributes .....	9-5
<b>Column Configuration Files</b> .....	9-5
Data Sources in XML Column Files.....	9-10
Sorting on User-Defined Metrics .....	9-10
Hierarchy Filtering.....	9-10

## 10 Configuration Properties Files

Introduction.....	10-1
config.properties Settings.....	10-1
suite.properties Settings .....	10-3
gdconfig.properties Settings .....	10-5

---

---

# Send Us Your Comments

Oracle® Retail Clearance Optimization Engine Configuration Guide, Release 14.0.

Oracle welcomes customers' comments and suggestions on the quality and usefulness of this document.

Your feedback is important, and helps us to best meet your needs as a user of our products. For example:

- Are the implementation steps correct and complete?
- Did you understand the context of the procedures?
- Did you find any errors in the information?
- Does the structure of the information help you with your tasks?
- Do you need different information or graphics? If so, where, and in what format?
- Are the examples correct? Do you need more examples?

If you find any errors or have any other suggestions for improvement, then please tell us your name, the name of the company who has licensed our products, the title and part number of the documentation and the chapter, section, and page number (if available).

---

---

**Note:** Before sending us your comments, you might like to check that you have the latest version of the document and if any concerns are already addressed. To do this, access the new Applications Release Online Documentation CD available on My Oracle Support and [www.oracle.com](http://www.oracle.com). It contains the most current Documentation Library plus all documents revised or released recently.

---

---

Send your comments to us using the electronic mail address: [retail-doc\\_us@oracle.com](mailto:retail-doc_us@oracle.com)

Please give your name, address, electronic mail address, and telephone number (optional).

If you need assistance with Oracle software, then please contact your support representative or Oracle Support Services.

If you require training or instruction in using Oracle software, then please contact your Oracle local office and inquire about our Oracle University offerings. A list of Oracle offices is available on our Web site at <http://www.oracle.com>.



---

---

# Preface

Clearance Optimization Engine (COE) is an application that provides markdown recommendations and forecasts that allow customers to make informed markdown decisions. In this way, customers can maximize gross margins on seasonal merchandise while clearing inventory to specified levels by defined dates.

## Audience

This document is intended for system administrators who configure and manage COE.

## Documentation Accessibility

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

### Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

## Related Documents

For more information, see the following documents in the Oracle Retail Clearance Optimization documentation set:

- *Oracle Retail Clearance Optimization Engine Administration Guide*
- *Oracle Retail Clearance Optimization Engine Data Model*
- *Oracle Retail Clearance Optimization Engine Grid Designer User Guide*
- *Oracle Retail Clearance Optimization Engine Grid Designer Online Help*
- *Oracle Retail Clearance Optimization Engine Implementation Guide*
- *Oracle Retail Clearance Optimization Engine Installation Guide*
- *Oracle Retail Clearance Optimization Engine Online Help*
- *Oracle Retail Clearance Optimization Engine Operations Guide*
- *Oracle Retail Clearance Optimization Engine Release Notes*

or in the Oracle Retail Analytic Parameter Calculator Markdown Optimization documentation set:

- *Oracle Retail Analytic Parameter Calculator Markdown Optimization Configuration Guide*
- *Oracle Retail Analytic Parameter Calculator Markdown Optimization Installation Guide*
- *Oracle Retail Analytic Parameter Calculator Markdown Optimization Release Notes*
- *Oracle Retail Analytic Parameter Calculator Markdown Optimization User Guide*

## Customer Support

To contact Oracle Customer Support, access My Oracle Support at the following URL:

<https://support.oracle.com>

When contacting Customer Support, please provide the following:

- Product version and program/module name
- Functional and technical description of the problem (include business impact)
- Detailed step-by-step instructions to re-create
- Exact error message received
- Screen shots of each step you take

## Review Patch Documentation

When you install the application for the first time, you install either a base release (for example, 14.0) or a later patch release (for example, 14.0.1). If you are installing the base release and additional patch releases, read the documentation for all releases that have occurred since the base release before you begin installation. Documentation for patch releases can contain critical information related to the base release, as well as information about code changes since the base release.

## Improved Process for Oracle Retail Documentation Corrections

To more quickly address critical corrections to Oracle Retail documentation content, Oracle Retail documentation may be republished whenever a critical correction is needed. For critical corrections, the republication of an Oracle Retail document may at times not be attached to a numbered software release; instead, the Oracle Retail document will simply be replaced on the Oracle Technology Network Web site, or, in the case of Data Models, to the applicable My Oracle Support Documentation container where they reside.

This process will prevent delays in making critical corrections available to customers. For the customer, it means that before you begin installation, you must verify that you have the most recent version of the Oracle Retail documentation set. Oracle Retail documentation is available on the Oracle Technology Network at the following URL:

<http://www.oracle.com/technetwork/documentation/oracle-retail-100266.html>

An updated version of the applicable Oracle Retail document is indicated by Oracle part number, as well as print date (month and year). An updated version uses the

same part number, with a higher-numbered suffix. For example, part number E123456-02 is an updated version of a document with part number E123456-01.

If a more recent version of a document is available, that version supersedes all previous versions.

## Oracle Retail Documentation on the Oracle Technology Network

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

[http://www.oracle.com/technology/documentation/oracle\\_retail.html](http://www.oracle.com/technology/documentation/oracle_retail.html)

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

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

## Conventions

The following text conventions are used in this document:

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



---

---

# Getting Started

This chapter provides an orientation to COE and contains the following sections:

- [About Clearance Optimization Engine](#)
- [Getting Started with COE](#)
- [Getting Started with Configuring COE](#)
- [COE Required Skill Sets](#)
- [Change Management](#)
- [Applying Patches](#)

## About Clearance Optimization Engine

The Clearance Optimization Engine (COE) provides the What If RMI interface that Item Planning Configured for COE can access using the RPAS special expression. This allows the IP application to produce in-season price recommendations and forecasts that account for planned promotions and future markdowns in the product life cycle. The forecast includes a sales plan and an optimal price plan.

COE produces its recommendations during the weekly model run. The results of the model run are stored in the database. These results can be extracted using the sendback files. They are then available for use by IP.

Users have the ability to perform real-time What-If scenarios from within Item Planning and alter plans in order to see the results of those changes. The changes include planning a markdown, changing future prices, changing an order, changing the exit date, changing the salvage value, and changing the sell-through target.

Business rules can also be imported from Item Planning into COE in a format that follows the COE standard interface. This load occurs weekly. The following business rules listed in [Table 1-1, "Business Rule Mapping Between COE and Item Planning"](#), can be imported.

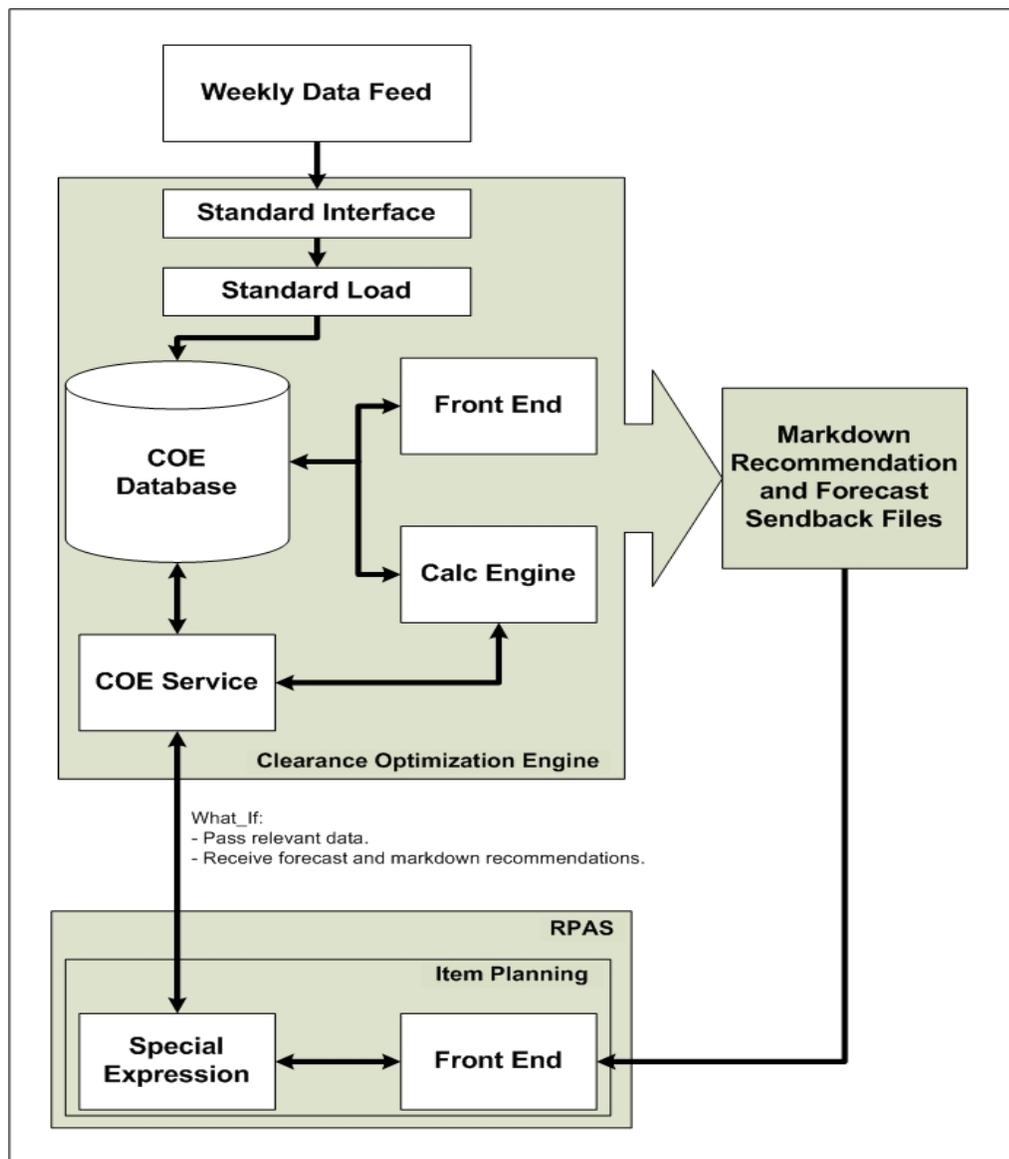
**Table 1-1 Business Rule Mapping Between COE and Item Planning**

COE Business Rule	RPAS Business Rule
Outdate	Exit Date
Planned Start Date	Start Sell Date
Sell Through Target	Sell Thru %

COE provides a sendback functionality that makes the model run results available to the Item Planning application.

The relationship between COE and Item Planning is shown in Figure 1-1, "Relationship Between COE and Item Planning".

**Figure 1-1 Relationship Between COE and Item Planning**



## Getting Started with COE

Clearance Optimization Engine (COE) is deployed in a distributed, replicated architecture with a single system image and a single point of control and configuration. The deployment of changes to the configuration is based on a comprehensive set of configuration changes for a specific retailer. Change management supports the rolling back of changes if undesirable side effects occur.

A number of environments are involved in COE deployments:

- **Development environment.** Used internally by an implementer to try out initial configurations or enhancements.
- **Test environment.** Used internally to verify and validate correct functionality prior to deployment to a staging environment or a production environment.
- **Staging environment.** Used for testing, validating, and verifying changes before they are applied to a production environment.
- **Production environment.** The environment that provides the service to end-users and in which the weekly batch process is run. This environment is change-controlled and monitored.

A typical COE environment consists of the following integrated pieces:

- Oracle database
- Service server: OWL
- COE service, consisting of software, database schema, baseline configuration, and service server setup
- Environment-specific configuration:
  - Database schema updates
  - Custom integration points
- IT Infrastructure
  - Hardware and systems software
  - Networking setup
  - Database instance creation
  - Database clients
  - Service server base installation
  - User accounts
  - User access

## Getting Started with Configuring COE

Once you have installed COE, you are ready to configure it to perform optimization runs in a production environment. Optimization runs produce forecasting and markdown recommendations.

The best approach to configuring COE is to get a basic production environment up and running. Once that is done, you can customize the service incrementally as needed to meet specific retailer requirements and as business requirements change.

## Configuration Process

The basic process, at a high level, consists of the following steps:

1. Plan and prepare the product environment.
2. Collect information about business requirements, including the level of sales data and optimization, the contents of the weekly data feed, the content of the weekly sendback files, business rule configuration, markdown validation configuration, model start date configuration, price ladder configuration, promotions configuration, and markdown calendar definition.
3. Install the service. (See *Oracle Retail Clearance Optimization Engine Installation Guide*.)
4. Load historic data from the retailer.
5. Analyze the business data and develop parameters for the forecasting model. (Analytical Services)
6. Load weekly production data from retailer.
7. Do the first optimization run, using primarily default service settings.
8. Use the diagnostic tools to assess and troubleshoot the optimization run and modify the configuration as needed.
9. Perform weekly optimization runs in a production environment.
10. Configure the service incrementally according to retailer requirements.
11. Do additional optimization runs to test the incremental changes to the configuration.
12. Create user roles and actions.

## COE Required Skill Sets

This section describes the skill sets that are required to run COE.

### Operations

The Operations staff is responsible for the daily operation of the service. Skills include:

- Basic UNIX knowledge. COE provides a UNIX command line interface to all jobs that require scheduling.
- An understanding of relational database management systems and the use of SQL.
- An understanding of enterprise schedulers. The weekly batch process consists of large number of jobs with complex dependencies that are best managed using a scheduler.

### Systems Administration

The systems administration staff is responsible for daily UNIX administration. Skills include:

- Familiarity with volume management.
- Setting up enterprise backups for file systems and databases. Performing nightly hot backups. An understanding of relational database software. Tape backups and restores.
- Tape rotation.

- Operating system installation.
- Patch service.
- Security-enabled OS configurations.
- Kernel parameter tuning for DBMS and J2EE servers.
- Installation and configuration of ssh, rsync, bash, Gnu utilities, Python, and sudo.
- Creation and integration of init scripts.
- Scheduling of cron jobs.
- SAN storage configuration and management.
- Shell scripting.

### **Database Administration**

The database administration staff is responsible for critical daily RDBMS management and troubleshooting. Skills include:

- Management of large databases (50 GB - 500GB).
- Database backup and recovery, including monitoring, backups, and restores.
- Data migration between test and production environments.
- Database tuning in response to problems or to enhance performance.
- Database layout, including creating tablespaces and partitioning.
- Storage management, including data volumes, log volumes, and index volumes.

### **Network Administration**

The network administration staff is responsible for managing network equipment. Skills include:

- TCP/IP.
- Hardware load balancing for high availability and horizontal scalability.
- If SSL is being used to encrypt data, SSL Hardware Acceleration.
- Configuration of services on Cisco content switches or F5 BigIP switches.
- Managing routers with traditional ACLs.
- Managing firewalls for granular ACLs.
- Managing VPN tunnels.
- Understanding interoperability issues.

### **Storage Administration**

The storage administration staff is responsible for managing a SAN environment and should be familiar with basic LUN management.

### **Service Server Administration**

The service server administration staff should be familiar with the management of WebLogic. Skills include:

- Deploying and managing Java applications in a J2EE environment.
- Installing and configuring application server software.

- Configuring and tuning JDBC drivers and connection pools.
- Configuring JMS server and JMS queues.
- Administering multiple servers and clusters from a J2EE console.
- Deploying Web applications and EJB applications in the J2EE server.
- Configuring and tuning threads and message-driven beans.
- Monitoring and troubleshooting J2EE servers.
- Database development experience with Oracle.
- XML knowledge.
- Familiarity with shell scripts, Perl, and UNIX/AIX environments.

## Change Management

The following table details the types of changes that can occur to the configuration after it has been implemented.

**Table 1–2 Typical COE Configuration Changes**

<b>Change</b>	<b>Example</b>
Business rules that are managed by end users or administrators	Defining the start date.
Data feeds that are not part of the standard weekly load	Changes or additions to price ladders
Patches or hot fixes	Correcting a defect or adding a new feature
Changes to scheduled processes resulting from a retailer business need	Change to arrival time for weekly data feed. Change to database backup schedule. Change to sendback schedule.
Changes to hardware or software infrastructure	OS security patch. Hardware replacement or addition. Service server patch. DBMS software patch.
Changes or enhancements to the service configuration	New business rule value.
Changes to data hierarchies that impact the functional or analytical configuration	Major merchandise reclassification. Major changes to climate zones.
Updates to analytical parameters	Changes to seasonality parameters to reflect recent history of sales data.

## Implementing and Deploying Changes

The following process is considered the best practice when changing the configuration.

1. Refresh a segregated development environment with a recent copy of the production environment. This should include:
  - restoring the database from a backup, export, or disk image
  - installing all configuration files as they are in the production environment

- verifying the correct functioning of the service in the production environment. A performance baseline should be captured if changes are being made that could impact the performance of the standard load or the optimization run.
- 2. Ensure that the configuration prior to the change is saved to source control.
- 3. Make changes in the production environment and unit test to verify that they are functioning correctly.
- 4. To test the configuration changes adequately, execute a full weekly cycle, including loading data, running the model, doing What If calculations using the service, and running sendbacks. Multiple weekly cycles may be appropriate.
- 5. After changes have been verified in the development environment, they should be checked into source control.
- 6. Create a staging environment with the most recent copy of the production environment and capture performance baseline data.
- 7. Apply the changes checked into source control to the test environment, using the same method that will be used to apply the changes to the production environment.
- 8. Perform integration testing of the changes. A general smoke test of the service function and optimization run should be performed. The performance should be evaluated relative to the baseline data.
- 9. Most production changes should be applied in the interval between the final weekly sendback and the upcoming data load and model run. A full backup of the production database and service environment should be taken prior to applying any changes to production.

It can occasionally be necessary to revert a configuration if the implemented change does not work as expected. To do this, restore the backup image.

## Applying Patches

Oracle makes changes to the service available as a configuration build. This build should be stage prior to being applied to a production environment. The build file should be copied to the `INSTALL_BASE` directory of the environment to be updated.

Use the following command to apply the new build:

```
INSTALL_BASE/integration/tools/field.sh <path_to_build_file>/<build_name>.tgz
```

This command executes the following steps:

- Backup
- Cleans up old files
- Unpacks the tar archive
- Specialization
- Expands templates
- Automatic editing changes
- Stops servers
- Cleanup and synch
- Updates database
- Applies one-time and regular schema updates

- Updates the BRPM configuration
- Restarts the servers
- Updates user roles
- Automation set-up
- Cron set-up

---

---

# User Management

The User Management utility is accessed from the COE Administration menu and is used to configure user access to the application.

This chapter contains the following sections:

- [Introduction](#)
- [About User Roles and User Actions](#)
- [User Management Bulk Loader Utility](#)
- [User Management Security](#)
- [Setting Up the Password Policies and Account Lockouts](#)
- [Clearance Optimization Engine Sample XML Files](#)

## Introduction

User Management is a utility that lets you create, modify, and remove user accounts from a central location. The User Management utility is installed automatically when you install the application.

As part of the installation, the root user is created with only the Price Admin role. The root user's credentials must be added to the Oracle Wallet before the installation and provided during the installation. The root user is responsible for creating the other users and assigning roles to these users.

In addition, the griduser1 user is created as part of the installation.

Each user who accesses the application must have a user account. Each user account is assigned one or more roles that determine the types of actions the user can perform with the application.

Single sign-on is supported so that users can access from the Main Menu the COE GUI, BRPM, UM, and Seasonality Manager without additional authentication.

## About User Roles and User Actions

Roles are defined by a specific set of user actions. The actions that define each role serve to delimit the activities a user can perform. All actions are self-contained. For example, Write does not imply Read. So a role must include all the actions that are necessary for complete functionality. If a role is assigned at a specific level in the hierarchy and that hierarchy level is removed, then the role is removed.

COE comes with a default set of roles, loaded into ROLE\_ACTION\_TBL. Default action are assigned to the roles. These cannot be deleted. For more information on

Business Rule Property Manager roles and actions and Seasonality Manager roles and actions, see those respective chapters.

---



---

**Note:** You must first load the Merchandise Hierarchy and Location Hierarchy before you assign roles.

---



---

The following table lists the COE roles and the default actions assigned to those roles.

**Table 2–1 COE Roles and Default Actions**

<b>Role</b>	<b>Default Action</b>
PRICE_APPROVER	PRICE_APPROVE
PRICE_SUBMITTER	PRICE_SUBMIT PRICE_COMMENTS_EDIT
PRICE_USER	PRICE_MARKDOWNS_VIEW PRICE_MAINTAINING_MERCHANDISE_VIEW PRICE_BRM_VIEW PRICE_USER_PROFILE_VIEW PRICE_REPORTS_VIEW PRICE_GUARD PRICE_ITEM_INFO_VIEW
PRICE_VIEWER	PRICE_VIEW
BRM_PRICE_EDIT	BRM_PRICE_EDIT PRICE_SEASONALITY_EDIT
BRM_PRICE_VIEW	BRM_PRICE_VIEW PRICE_SEASONALITY_VIEW
BRM_PROFITLOGIC_EDIT	BRM_PROFITLOGIC_EDIT
BRM_PROFITLOGIC_VIEW	BRM_PROFITLOGIC_VIEW
WHAT_IF_SERVICE_USER	MDO_WHAT_IF_SERVICE_EXEC
GRID_DESIGNER	GD_SAVE GD_PUBLISH GD_BACKUP

The COE roles are defined as follows.

- PRICE\_ADMIN\_EXEC – can run the PriceAdmin commands.
- PRICE\_APPROVER – has read-only access to worksheets and can approve submitted worksheets at the specified level in the hierarchy, but cannot submit worksheets.
- PRICE\_SUBMITTER – can submit worksheets at the specified level in the hierarchy.
- PRICE\_USER – allows access to the UI.
- PRICE\_VIEWER – has read-only access to worksheets at the specified level in the hierarchy.

- BRM\_PRICE\_EDIT – can edit a business rule through the UI at the item level or higher.
- BRM\_PRICE\_VIEW – can view a business rule through the UI at the item level or higher.
- BRM\_PROFITLOGIC\_EDIT – can edit administrative business rules.
- BRM\_PROFITLOGIC\_VIEW – can view administrative business rules.
- WHAT\_IF\_SERVICE\_USER – similar to the PRICE\_USER role, but for the web service.

Significant COE actions are defined as follows.

- PRICE\_COMMENTS\_EDIT – can edit tool tips.
- PRICE\_GUARD – guards against illegal access to the application.
- MDO\_WHAT\_IF\_SERVICE\_EXEC – provides access to the web service.
- PRICE\_MAINTAINING\_MERCHANDISE\_VIEW\_NO\_PG\_EDIT – provides read-only access to the Pricing Group Manager (only the action is available by default).
- PRICE\_ITEM\_INFO\_VIEW – can view item information
- PRICE\_SEASONALITY\_VIEW – can view seasonality curves but cannot override or change mappings.
- PRICE\_SEASONALITY\_EDIT – can edit seasonality curves. This permission only applies to hierarchies that the user has permissions to edit.

Roles are assigned to users with restrictions that are defined at or above a specific node of the merchandise hierarchy and the location hierarchy. The scope of actions can be across the merchandise and location hierarchies. The scope must be defined at or above the class planning level.

The sample file, "Role Assignment Sample XML File" provides an illustration of defining the scope.

## About User Management Roles

User accounts with user management roles have access to features such as creating users, assigning roles, removing user accounts, resetting passwords.

When a user with a user management role logs on, a link to the User Management utility appears on the Main Menu.

The following list describes the default User Management roles:

- UM\_READ\_ONLY\_ADMIN – This role allows read-only access to the User Management utility. This role has privileges to view the list of users and their roles and hierarchy levels, but not to create new user accounts or modify or inactivate existing ones.
- UM\_ROLE\_ASSIGN\_ADMIN – This role allows assigning new roles (and related hierarchy levels) to existing user accounts, but it does not allow the creation of new user accounts.
- UM\_USER\_ADMIN – This role allows creating new user accounts, but it does not allow the assignment of roles to the new accounts.

## User Management Bulk Loader Utility

If you are creating a small number of user accounts using the default roles, you can create those accounts using through the service Main Menu. (For more information on using the User Management utility, consult the *Clearance Optimization Engine Online Help*.) However, if you want to create user accounts for a group of users all at one time, you can use the User Management bulk loader utility.

Prior to running the User Management bulk loader utility, you must:

- Set the `jndi.properties`. The `jndi.properties` file, which is created by the installer and is located in `<installed>/modules/tools/conf/jndi.properties`, specifies the initial context factory and the url where the JNDI lookups are carried out.

For OAS, typical values are:

```
app.server.home={oracle.home}
```

```
java.naming.factory.initial=oracle.j2ee.rmi.RMIInitialContextFactory
```

```
java.naming.security.principal={oracle.admin.userid}
```

```
java.naming.security.credentials={oracle.admin.password}
```

```
java.naming.provider.url=opmn:ormi://{oracle.server.address}:{oracle.admin.
port}:{oracle.instance.name}/UserManagement
```

- Make sure that `usermanagement.ear`, `suiteproperties.ear`, and `common4p.ear` are deployed on the running server.

## Users and Roles

You need to create and validate (using a tool like XML Spy) three XML files containing entries for Users, Roles, and Role Assignments.

Note that the actions associated with roles must be defined in order for the roles to be successfully created.

- The user file contains user names. All user names must be unique. The schema includes a flag that indicates whether or not the password should be hashed.
- The Roles file contains the possible roles that can be assigned. All role keys must be unique. The action key attributes must be loaded into the database before the bulk loader utility can be used. All elements and attributes must be lower case.
- The Role Assignment file contains user names and the role or roles associated with the user name. The user names must be loaded into the database before this file can be processed by the bulk loader utility. All elements and attributes must be lower case. The merchandise ID and the Location ID are provided by a pipe-delimited string of `CLIENT_LOAD_ID`, as found in the `MERCHANDISE_HIERARCHY_TBL` or `LOCATION_HIERARCHY_TBL`. For example, to assign a user to a certain department of merchandise:

```
CHAIN COMPANY DIVISION DEPARTMENT merchandise attribute in .xml
```

```
-----
```

```
0 1 123 8765 1 | 123 | 8765
```

```
0 1 22 789 1 | 22 | 789
```

The information in the three files is loaded into database tables by the bulk loader. (Users and Role Assignments can be added or modified via the service Main Menu. Roles can only be added or modified via the bulkloader.)

## The XML Files

The XML schemas and samples of the three required XML files can be found in <installed>/config/Price/security.

**Table 2–2 User Management XML Files**

Schema	Sample	Database Table
user-set.xsd	price_user_set.xml	USERS_TBL
role-set.xsd	price_role_set.xml	ROLES_TBL
role-assignment-set.xsd	price_assignment_pricedataset.xml	USER_RESOURCE_ROLE_TBL

## Standard Load Prerequisites

Before you run the bulk loader, you must run the standard load so that the merchandise hierarchy table (ASH\_MH\_TBL) and the location hierarchy table (ASH\_LH\_TBL) have been populated. For more information on the standard load, see the *Oracle Retail Clearance Optimization Engine Operations Guide*.

## Shell Script

The shell script for running the User Management bulk loader utility is located in <installed>/modules/tools/bin/bulkloader.sh.

Usage:

-apphome <directory>	app server 'home' directory
-assignfile <file>	process given file for loading role assignments
-rolefile <file>	process given file for loading roles
-userfile <file>	process given file for loading users
-user <admin>	administrative user's username
-passwd <password>	admin user's password
-verbose	print DEBUG information

Note that -passwd is the hashed value of the root password that by default is set to dc76e9f0c0006e8f919e0c515c66dbba3982f785. If the root password is changed, the password string provided will not work.

To run the shell script (an example):

Note that the three files can be loaded separately or at the same time.

```
$bash bulkloader.sh -apphome /<oracle_home>/j2ee/home -assignfile
../conf/price_assignment_set.xml -rolefile ../conf/price_role_set.xml -userfile
../conf/price_user_set.xml
```

```
$bash bulkloader.sh -apphome /usr/local/bin/bea/weblogic10/server -assignfile
../conf/price_assignment_set.xml -rolefile ../conf/price_role_set.xml -userfile
../conf/price_user_set.xml
```

The bulk loader will display error messages if problems occur. For more details, you can use the -verbose argument.

You can update Users and Roles with the bulk loader. The existing tables in the database will be overwritten. You cannot modify the Role Assignment table; however, you can add new Role Assignments.

## User Management Security

In order to ensure the security of the service, the following security features are available in User Management:

- The AUTOCOMPLETE attribute is configurable on forms where passwords or user names are entered. By default, AUTOCOMPLETE is set to ON, so that sensitive information is stored.  
`<ConfigRoot>/suite/suite.properties/suite.loginform.autocomplete = ON`
- The session time out value is set in `suite.httpsession.timeout`. By default, it is set to 1800 seconds.  
`<ConfigRoot>/suite/suite.properties/suite.httpsession.timeout = 1800`
- The configure login time out value is independent of the session time out and should be of a shorter time period than the session time out. If configure time out value is not set, it defaults to the session time out value. By default, it is set to 1800 seconds.  
`<ConfigRoot>/suite/suite.properties/suite.userlogin.timeout = 1800`
- The attribute on the session ID cookie is set for secure deployments only so that the cookie can be transmitted via HTTPS and over an encrypted network. The default value is FALSE.  
`<ConfigRoot>/suite/suite.properties/suite.cookie.secure = FALSE`
- The service can be configured so that the logout page can either be displayed to the user or not. If the logout page is displayed, the user clicks **Login** to return to the Login page and **Close** to close the browser. The default setting is not to show the logout page but to return the user to the login page after logout.  
`<ConfigRoot>/suite/suite.properties/suite.logoutpage.show = FALSE`

## Setting Up the Password Policies and Account Lockouts

Use the `useraccount.properties` file, located in `<install-dir>/config/UserManagement`, to set up the following password policies for the user accounts:

- Password expression and length
- Previous password check
- Password expiration period
- Maximum allowed unsuccessful login attempts

Note that password policies are enabled by default.

## Clearance Optimization Engine Sample XML Files

This section provides sample input files for adding or updating users and roles.

### User Sample XML File

```
<?xml version="1.0" encoding="UTF-8" ?>
```

```

- <user-set hash-passwords="true"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="user-set.xsd">
  <user username="titusten" password="titusten" last-name="user" first-name="test"
middle-initial="U" employeeID="4" title="serf" />
  <user username="chain" password="chain" last-name="Franklin" first-name="Aretha"
middle-initial="A" employeeID="5" title="Respect" />
  <user username="brm_price" password="brm_price" last-name="ruler"
first-name="business" middle-initial="P" employeeID="6" title="fool" />
  <user username="service" password="service" last-name="User" first-name="What_
if" middle-initial="L" employeeID="9" title="Remote user" />
  <user username="admusr" password="admusr" last-name="Admin" first-name="What_if"
middle-initial="L" employeeID="10" title="Remote Admin user" />
</user-set>
- <!-- This XML supports adding/replacing "users" for the User Management
subsystem.
-->
- <!--
Note:
1) User usernames must be unique among all applications.
2) <user-set> has a flag indicating whether the password should be hashed
prior to persistence. This support migration from prior
implementations of Price so that users can keep existing passwords
3) passwords must be alphanumeric

-->

```

## Roles Sample XML File

```

<?xml version="1.0" encoding="UTF-8" ?>
- <role-set xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="role-set.xsd">
- <role key="BRM_PRICE_VIEW">
  <action key="BRM_PRICE_VIEW" />
</role>
- <role key="BRM_PRICE_EDIT">
  <action key="BRM_PRICE_EDIT" />
</role>
- <role key="BRM_PROFITLOGIC_VIEW">
  <action key="BRM_PROFITLOGIC_VIEW" />
</role>
- <role key="BRM_PROFITLOGIC_EDIT">
  <action key="BRM_PROFITLOGIC_EDIT" />
</role>
- <role key="WHAT_IF_SERVICE_USER">
  <action key="PRICE_GUARD" />
  <action key="WHAT_IF_SERVICE_EXEC" />
</role>
- <role key="WHAT_IF_SERVICE_ADMIN">
  <action key="PRICE_GUARD" />
  <action key="WHAT_IF_SERVICE_EXEC" />
  <action key="PRICE_BRM_VIEW" />
  <action key="BRM_PRICE_EDIT" />
  <action key="BRM_PROFITLOGIC_EDIT" />
</role>
</role-set>
- <!-- This XML supports adding/updating "roles" in the User Management
subsystem.
-->

```

```

- <!--
  Note:
  1) All role keys must be unique among all applications.
  2) The action key attributes must be present in the db ACTION_TBL before
  bulkloader
      is run. Action key values should also be unique among
      all applications.
  3) All elements and attributes are case sensitive and all are lower case.

-->

```

## Role Assignment XML Sample File

```

<?xml version="1.0" encoding="UTF-8" ?>
<role-assignment-set xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="role-assignment-set.xsd">
<!--
This role guards the entire application
Assing chain level permissions to all users so works
for all datasets.
-->

<role key="BRM_PRICE_EDIT">
  <user-assignment username="chain">
    <node location="" merchandise="" />
  </user-assignment>
  <user-assignment username="titusten">
    <node location="" merchandise="1|1|11"/>
    <!-- worksheet 1, merchandise 85639-->
    <node location="" merchandise="1|1|12"/>
    <!-- worksheet 2, merchandise 86555-->
    <node location="" merchandise="1|1|14"/>
    <!-- worksheet 3, merchandise 87205-->
    <node location="" merchandise="1|1|15"/>
    <!-- worksheet 4, merchandise 87397-->
  </user-assignment>
  <user-assignment username="brm_price">
    <node location="" merchandise="" />
  </user-assignment>
</role>

<role key="BRM_PROFITLOGIC_EDIT">
  <user-assignment username="chain">
    <node location="" merchandise="" />
  </user-assignment>
  <user-assignment username="titusten">
    <node location="" merchandise="1|1|11"/>
    <!-- worksheet 1, merchandise 85639-->
    <node location="" merchandise="1|1|12"/>
    <!-- worksheet 2, merchandise 86555-->
    <node location="" merchandise="1|1|14"/>
    <!-- worksheet 3, merchandise 87205-->
    <node location="" merchandise="1|1|15"/>
    <!-- worksheet 4, merchandise 87397-->
  </user-assignment>
</role>

```

```
<role key="WHAT_IF_SERVICE_USER">
  <user-assignment username="service">
    <node location="" merchandise="" />
  </user-assignment>
  <user-assignment username="submit">
    <node location="" merchandise="" />
  </user-assignment>
  <user-assignment username="titusten">
    <node location="" merchandise="" />
  </user-assignment>
</role>

<role key="WHAT_IF_SERVICE_ADMIN">
  <user-assignment username="admusr">
    <node location="" merchandise="" />
  </user-assignment>
  <user-assignment username="titusten">
    <node location="" merchandise="" />
  </user-assignment>
</role>
</role-assignment-set>
```



---

## Business Rule Property Manager

This chapter explains how to configure the business rules using the Business Rule Property Manager.

This chapter contains the following sections:

- Introduction
- "Getting Started"
- Default Business Rules
- Business Rule Definitions
- Loading Business Rule Definitions
- Configuring Business Rule Definitions
- Business Rule Instances
- Custom Attributes
- Business Rules and Inference Rules
- Business Rule Property Manager Bulk Loader
- Business Rule Property Manager Properties
- Business Rule Property Manager Grid Configuration

### Introduction

The Business Rule Property Manager (BRPM) is a Clearance Optimization Engine utility that is used to view and change business rule settings. Business rules determine which data is used by the application for an optimization. In effect, business rules specify retailer constraints that are used by the application to determine markdowns and forecasting.

The application provides a file that contains the business rule definitions. The business rule definitions specify the constraints that apply to business rule instances (mappings between location and merchandise hierarchy levels and business rule values). The definitions are configurable; however, most of the business rules have default values that can be used to perform any initial application work.

The COE business rules are implemented through the inference rules, using values managed in the BRPM. Both the inference rules and the business rules are points of customization for the application.

The BRPM is accessed through the application Main Menu. A user's ability to view and change business rule settings is specified by the permissions attached to the user

role(s) assigned to them. These roles are assigned using the User Management utility. (For more information, see the *Oracle Retail Clearance Optimization Engine Administration Guide*.) The actions used by BRPM roles are defined in the business rule definition file (discussed later in this chapter).

The BRPM is used to:

- view current business rule settings for specific items
- change business rule settings in time for the next optimization
- change business rule settings when problems occur during a model run, so that the problem can be fixed and the model run restarted
- view the history of business rule changes

## Getting Started

Once you have completed the initial installation and configuration of COE, you must load all the data required by the application, in a format specified by the standard interface specifications and using the standard load procedure. (See the *Oracle Retail Clearance Optimization Engine Operations Guide* for information about the standard load.) You can then configure the application to match the retailer's specific business requirements.

The model run updates the forecasts, recommendations, and metrics that are displayed in the COE application through the UI. You can perform an initial model run using the default values provided with the application. This will allow you to get the system up and running. It will also provide you with a baseline configuration that you can use when planning your advanced configuration.

The advanced configuration is necessary in order to obtain meaningful markdown recommendations and forecasts from COE.

In order to do a model run, you must configure the business rule definitions and load them into COE. The default business rule definitions are contained in `/modules/tools/conf/DefaultRules/rule_definitions.xml`. An editable copy of the business rule definitions can be found in `config/businessrulemgr/rule_definitions.xml`. Once you have edited this file, you can use `/modules/tools/bin/brmadmin.sh` to load the file into the application.

The default settings, are, in general, sufficient for an initial model run. These default values are set at the highest level for everything in the system. The exceptions are Out Dates and Planned Start Dates, which are installed without default values assigned. Prior to the model run, you should enter Out Dates, using either the BRPM or through the application UI (Maintaining Merchandise). If you are going to use Planned Start Date as your Model Start Date, you should enter that value as well, using either the BRPM or through the application UI (Maintaining Merchandise). (Note that `set-plannedstartdate` in `p4pgui-config.xml` must be set to true in order to configure the Planned Start Date via the application UI. Excluded days for the planned start date can also be configured in `p4pgui-config.xml`.)

For more information on the model run, see the *Oracle Retail Clearance Optimization Engine Operations Guide*.

## Default Business Rules

COE is configured, by default, with 16 default business rules accessible through the BRPM. The values for the business rules are fetched by the `IR_BUSINESS_POLICY`

inference rule and used by that inference rule as well as others. The default business rules are, in effect, a subset of the default set of inference rules.

Certain of the default rules are only used by administrators for system-level configuration.

The default Business Rules are:

**Table 3–1 Default Business Rules**

<b>Business Rule Name/ Display Name Used in the UI</b>	<b>Business Rule Description</b>	<b>Default Value</b>
NO_TOUCH_AFTER_LAND No Touch 1st	The minimum number of weeks after the model start date before the item is eligible for a markdown. (Note that "touch" refers to retail activity and "land" refers to the period when there are enough weeks of sales to start forecasting.)	7
NO_TOUCH_AFTER_MKDN No Touch Between	The minimum number of weeks between markdowns (after the first one).  Note that 0 is not a valid value.	7
MAX_MKDN_NO Max #	The maximum number of markdowns permitted for an item during its entire life cycle.	3
MIN_FIRST_MKDN Min Initial	The minimum amount for the first markdown, which is the lowest percentage drop allowed from the current ticket price at the time of the initial markdown.	0
MIN_OTHER_MKDN Min Other	The minimum amount for any markdown after the first one. The lowest percentage drop allowed from the current ticket price at the time of the markdown.	0
MAX_FIRST_MKDN Max Initial	The maximum amount for the first markdown, which is the highest percentage drop allowed from the current ticket price at the time of the initial markdown.	1
MAX_OTHER_MKDN Max Other	The maximum amount for any markdown after the first one. The highest percentage drop allowed from the current ticket price at the time of the markdown.	1

**Table 3–1 (Cont.) Default Business Rules**

<b>Business Rule Name/ Display Name Used in the UI</b>	<b>Business Rule Description</b>	<b>Default Value</b>
PLANNED_START_DT Start Date	The date when an item will first be sold.	-
OUT_DT Out Date	The date planned for the end of inventory or by which a specific sell-through target is to be reached.	-
INVENTORY_TARGET Sell Thru %	The planned percentage of sell-through for an item at the out date. Expressed as a value between 0 and 1.	1
SALVAGE_WITHIN_TARGET Salv Within	The salvage value of remaining items if the target inventory is met. This is a percentage of the full price. Expressed as a value between 0 and 1.	1
SALVAGE_ABOVE_TARGET Salv Above	The salvage value of the remaining items if the target inventory is above the expected amount. This is a percentage of the full price. Expressed as a value between 0 and 1.	0
NO_TOUCH_BEFORE_OUT (Administrative Business Rule) No Touch EOL	The number of weeks before the outdate when markdowns are no longer permitted.	14
MIN_MKDN_FROM_FULL (Administrative Business Rule) Min % of Full	The minimum markdown, expressed as a percentage of the original full retail price. Used to narrow the list of possible prices for optimization.	0
MAX_MKDN_FROM_FULL (Administrative Business Rule) Max from Full	The maximum markdown, expressed as a percentage of the original full retail price. Used to narrow the list of possible prices for optimization.	1
MKDN_DAY_OF_WEEK Administrative Business Rule) Day of Week	A global setting for the day of the week on which markdowns occur. (Sunday = 1, Monday = 2, Tuesday = 3,...)	2
TEMP_MARKDOWNS_BLOCK	Defines whether TEMP markdowns are counted during the enforcement of the MinMarkdownInterval and MaxNumber-Markdowns (IR BUSINESS_POLICY). When value is 1, TEMP markdowns count.	1

**Table 3-1 (Cont.) Default Business Rules**

<b>Business Rule Name/ Display Name Used in the UI</b>	<b>Business Rule Description</b>	<b>Default Value</b>
POS_MARKDOWNS_BLOCK	Defines whether POS markdowns are counted during the enforcement of the MinMarkdownInterval and MaxNumber-Markdowns (IR_BUSINESS_POLICY). When value is 1, POS markdowns count.	1
MSD_FORCED_START_DT Forced Model Start Date	This is only used if the MODEL_START_OPTION in IR_MODEL_START_OPTION is set to sellThrough. (See the Inference Rule chapter for more information.) The value is an override date that forces the Model Start Date to be the first fiscal day of the week of the Forced Model Start Date.	NONE
MSD_SELLTHROUGH_PCT Model Start Sell Through Pct	This is only used if the MODEL_START_OPTION in IR_MODEL_START_OPTION is set to sellThrough. (See the Inference Rule chapter for more information.) The value is a threshold that triggers the assignment based on a ratio of sold units to total inventory.	2.00%
MSD_MAX_DELAY_WKS Max Model Start Delay	This is only used if the MODEL_START_OPTION in IR_MODEL_START_OPTION is set to sellThrough. (See the Inference Rule chapter for more information.) The value is the maximum number of weeks to wait before automatically assigning the Model Start Date.	2

**Table 3–1 (Cont.) Default Business Rules**

Business Rule Name/ Display Name Used in the UI	Business Rule Description	Default Value
OUT_WKS Out Weeks	This provides an alternate calculation for an item's exit date if the business rule 'OUT_DT' is not set. This is useful for the seasonal maintenance of exit dates. If an item's OUT_DT is not set, the alternate out date is calculated by combining the item's model_start_date value, the OUT_WKS value, and the global parameter OutDay. OUT_WKS provides the number of weeks that is added to an item's model start date, to determine a default out/exit week. Applying the global OutDay to it gives the specific alternate out date.	10

## Business Rule Definitions

You may want to configure the business rules to meet the needs of your business. The sample file (rule\_definitions.xml), located in /modules/tools/conf/SampleRules, provides an illustration of a set of business rules, including a configured attribute for Season Codes and some test rules that illustrate validation constraints. You can use this file as an advanced example of some possible approaches to take when planning your own configuration. However, your customization should be based on the default business rules. An editable copy of the business rule definition can be found in config/businessrulemgr/rule\_definitions.xml. Once you have edited this file, you can use /modules/tools/bin/brmadmin.sh to reload the file in order to implement the changes you have made.

The XML schema for the business rule definitions file is located in tools/brmadmin/conf/brm\_config.xsd

Here is a sample business rule definition, including two attributes, taken from /modules/tools/conf/SampleRules/rule\_definitions.xml:

```
<AttributeInfo name="SEASON_CODE"
  table="ITEMS_TBL"
  shortDescription="brm.rules.attribute.attr1.label"
  longDescription="brm.rules.attribute.attr1.description"
  allowOtherValues="N"/>
<AttributeInfo name="VENDOR"
  table="ITEMS_TBL"
  shortDescription="brm.rules.attribute.attr2.label"
  longDescription="brm.rules.attribute.attr2.description"
  allowOtherValues="Y"/>
<RuleDefinition name="MIN_FIRST_MKDN"
  shortDescription="brm.rules.params.minmarkdown.label"
  longDescription="brm.rules.params.minfirstmarkdown.description"
  readAction="BRM_PRICE_VIEW"
  editAction="BRM_PRICE_EDIT"
  <KeyLevel merchandiseLevel="DEFAULTLEVEL"
    locationLevel="DEFAULTLEVEL"
```

```

        matchAttribute1="N"
        matchAttribute2="N" />
<KeyLevel merchandiseLevel="WORKSHEET"
    locationLevel="WORKSHEET"
    matchAttribute1="N"
    matchAttribute2="N" />
<KeyLevel merchandiseLevel="WORKSHEET"
    locationLevel="WORKSHEET"
    matchAttribute1="N"
    matchAttribute2="Y" />
<ValueDefinition valueType="FLOAT"
    validationType="RANGE"
    shortDescription="brm.rules.value.markdownpct.label"
    longDescription="brm.rules.value.markdownpct.description"
    allowNullValues="N"
    defaultValue="0">
    <value ruleValue="0" />
    <value ruleValue="1" />
</RuleDefinition>

```

Each business rule definition contains the following information:

- The name of the business rule, in this case MIN\_FIRST\_MKDN.
- The short description resource ID for the business rule's name.
- The long description resource ID for the business rule description.
- The read action and the write action associated with the business rule. Roles, which are assigned to specific users and determine their permissions, are made up of actions. In order for users to be able to view and/or edit a business rule in the UI, they must be assigned a role that includes some combination of the following actions at the desired level or higher:

- BRM\_PRICE\_VIEW
- BRM\_PRICE\_EDIT

In addition, in order to be able to view and/or edit administrative business rules, users must be assigned a role that includes:

- BRM\_PROFITLOGIC\_VIEW
- BRM\_PROFITLOGIC\_EDIT
- An arbitrary number of key levels, which specify at what levels an instance of the business rule can be matched to an item. Each key level contains a merchandise hierarchy level, a location hierarchy level, and optional custom attributes that are used to determine the match between an item and a rule. To determine the rule mapping, matching occurs in the following order of precedence:
  1. Search the merchandise hierarchy from low to high for a match.
  2. Search the location hierarchy from low to high for a match.
  3. If an attribute is set to Y, match that item's value.
  4. If a attribute is set to N, match any attribute value.

If a rule is set at more than one level (for example outdates at both the merchandise/location level and the merchandise/location/attribute level), matching occurs at whatever the lowest level is, given the circumstances.

For the example rule definition shown above, matching of rule to item occurs at the DEFAULTLEVEL DEFAULTLEVEL level with any attribute, at the Worksheet

Worksheet level with any attribute, and at the Worksheet Worksheet level with the Vendor attribute.

- The type of value for the rule:
  - Integer
  - Floating point number
  - Date
  - String
- Validation, by range, enumeration, or none. If range, then the minimum and maximum values are given. If enumeration, a list of values is provided.
- Whether or not null values are allowed.
- The default value for the rule. If no default value is assigned, then NULL is assumed.
- If range is being used for validation, in combination with a valid type, the minimum and maximum values of the range are provided.

## Loading Business Rule Definitions

When you first begin using the service and whenever you make changes, you must load the business rule definitions file into the database, using `brmadmin.sh`.

Here is the usage for the `brmadmin.sh` script.

Server Mode (the default), which sends the request to the service server:

```
brmadmin.sh [-server] <config_root> <rule_definitions> [<host> <port>]
```

Client Mode, which processes the request on the client side:

```
brmadmin.sh [-client] <config_root> <rule_definitions>
```

where

- <config\_root> – the root directory of the service configuration files.
- <rule\_definitions> – the name of the xml file that contains the rule definitions.
- <host> – the service server host
- <port> – the service server port
- -h – displays help message
- -p – disables execution of database load procedures

You must preserve business rule definitions required by the service as well as those required by any inference rules that you have customized.

Business rule instances are affected when you modify business rule definitions. If you change rule value types, business rule instances may be deleted. In addition, changes to definitions may cause inconsistencies between the rules and the instances. As a result, the service may not perform properly.

If you change business rule definitions or add new ones, you may have to modify the grid configuration for the BRPM (see “[Business Rule Property Manager Grid Configuration](#)” on page 3-13).

## Configuring Business Rule Definitions

When configuring business rules to meet business needs, consider the following:

- When configuring key levels, you must manage the settable levels in conjunction with the inheritance hierarchy and user access.
- Since the service business rules are implemented through the inference rules, changes to the `ir.sql` may affect rule instances.
- Editing business rule definitions to change validations or default values may affect rule instances.
- Editing business rule definitions to change validations or default values may affect system performance.
- If you add a new business rule or change an existing one, you may need to add resources or modify the grid configuration.

## Business Rule Instances

A business rule instance is a specific mapping between a key and a rule value. When BRPM is installed, instances for the business rules exist at the top level and have the default values assigned to them (even if the top level is not a settable key level as defined in the business rule definition). If a business rule instance is deleted, the object that was assigned that instance will then inherit the settings of the instance at the next higher precedence level in the hierarchy. If the top level is deleted, the instance returns to the default value in the business rule definition file.

## Guidelines for Entering Business Rule Instances

You can enter values for business rules either by using the BRPM utility or the BRPM API. Both methods validate the instance against the BRPM rule definitions. When using the BRPM, you must be assigned a role that permits you to make changes to business rule values.

Business rule instances must be consistent with business rule definitions:

- Instances must be settable at the desired level, as defined in the rule definitions.
- Instances must conform to the validations defined in the rule definitions, which include the value type.
- Each instance must have an associated business rule definition.
- The key level of each instance must be permitted by the rule definition.
- The attribute values used in the instance keys should be consistent with the attributes in the BRPM configuration.

You can use the BRPM to view a business rule value that was in effect for a particular date. The UI displays all the rule values that would apply via inheritance. The value on the target date is the one with the highest precedence.

## Custom Attributes

Attributes are optional variables that can be added to a specific business rule definition. Two attributes are permitted. Attributes extend the business rule key and are used to determine the match between a rule and an item. Custom attributes should be added to the `rule_definitions.xml` file.

The attribute definition includes:

- the attribute name, which must be consistent with the column name in the source table.
- the name of the table that includes the column used for the attribute name. The following tables can be used:
  - ITEMS\_TBL
  - ITEMS\_CDA\_TBL
  - MERCHANDISE\_HIERARCHY\_TBL
  - MERCH\_ATTR\_TBL
  - LOCATION\_HIERARCHY\_TBL
  - LOCATION\_ATTR\_TBL
- the resource ID for the attribute's name.
- the resource ID for the attribute description.
- whether an attribute value other than one from the current set of values is valid.

To configure custom attributes (for example, Season Code and Vendor), you should define the resources used for their display as part of `businessrulemgrResources.properties`:

```
# Rules grid - Attributes
brm.rules.attribute.group.label=Attributes
brm.rules.attribute.group.description=Attributes
brm.rules.attribute.attr1.label=Season
brm.rules.attribute.attr1.description=Season Code
brm.rules.attribute.attr2.label=Vendor
brm.rules.attribute.attr2.description=Vendor
```

Once the custom attributes have been defined, you must run `com.profitlogic.db.birch.LoadBRMAttributeValues` (part of PRERUN) after you run `brmadmin.sh` in order to see the custom attributes changes in COE. `LoadBRMAttributes` loads values into `BRM_ATTRIBUTE_VALUE_TBL`. The service derives the values for the attributes displayed on the BRPM page from this table.

## Business Rules and Inference Rules

The business rules are implemented through the inference rules (discussed later in this chapter), using values customized and set in the BRPM. The `IR_BUSINESS_POLICY` inference rule (and other inference rules that require the data) can obtain business rule values in two ways:

- The `getBRValue` function obtains the current value, including any values that have changed since the last pre-model run step.
- During the pre-model run stage, the `item_brm_rules` table is populated at the item level to provide quick access to business rule values during the model run.

You can configure `IR_BUSINESS_POLICY`. For example:

- If you change the name of the business rule in the BRPM, you should also change it in `IR_BUSINESS_POLICY`.

- You can define a business rule value as a constant, if the value does not vary by merchandise level, location level, or attribute, by defining the constant in IR\_BUSINESS\_POLICY.

## Business Rule Property Manager Bulk Loader

The BRPM Bulk Loader provides a means for staging and loading a set of business rule instances. This utility is included within the standard interface and standard load (for more information, see the *Oracle Retail Clearance Optimization Engine Operations Guide*), but can also be implemented separately if new or updated business rule instances need to be loaded outside the normal scheduled batch processes. The Bulk Loader validates the business rule instances according to the guidelines described in “Guidelines for Entering Business Rule Instances” on page 3-9.

### Business Rule Instances Standard Interface Specification (ASH\_BRM\_INSTANCE\_TBL)

The data to be loaded by the Business Rule Property Manager bulk loader utility must conform to the following standard interface specification.

The merchandise and location keys map to the CLIENT\_LOAD\_ID. The merchandise and location levels map to LEVEL\_DESC. The rule name is the name of the business rule as specified in the business rule definition. The rule value is the value assigned to the business rule instance. The attribute values are the specific values for the custom variables, which have been derived from columns in the permitted source tables. The delete flag defines whether the instance is to be deleted (a value of 1) or added/updated (a value of 0 - the default).

**Table 3–2 Business Rule Instances Standard Interface Specification**

Attribute	Attribute Description	Data Type	Maximum Length	Nullable Y/N
MERCHANDISE_KEY	Key for this level of the hierarchy	String	50	N
MERCHANDISE_LEVEL	ID for this level of the hierarchy	String	50	N
LOCATION_KEY	Key for this level of the hierarchy	String	50	N
LOCATION_LEVEL	ID for this level of the hierarchy	String	50	N
RULE_NAME	The name of the business rule associated with the item.	String	64	N
RULE_VALUE	The business rule value assigned to the item.	String	100	N
ATTRIB1_VALUE	The specific value associated with the item for custom attribute 1.	String	100	Y
ATTRIB2_VALUE	The specific value associated with the item for custom attribute 2.	String	100	Y
DELETE_FLAG	A flag to indicate whether the instance is to be deleted or inserted. 0 = insert (the default). 1 = delete.	Integer	1	N

### Loading Instances

The Standard Load scripts that stage and load the data into the stage and load business rule instances. In order to invoke the BRPM Bulk Loader utility separately, as a manual process, do the following:

```
$ ./pl_stage_file.sh
```

```
Usage: ./pl_stage_file.sh [OPTION]... [FILE]...
Load the FILES into the database
-a DIR, --logdir_archive=DIR    directory to archive old log files
-c DIR, --controldir=DIR       directory with data control files
-e NUM, --errorthreshold=NUM   number of errors to allow in load
-l DIR, --logdir=DIR           directory to store logs
-r DIR, --configroot=DIR       configuration root directory
-f FILE NAME, --paramfile=FILE FILENAME of DB parameter file in CONFIGROOT
                               (similar to plexports.sh)
-h, --help                     display this help and exit
```

```
$ ./pl_load_data.sh
Usage: ./pl_load_data.sh [OPTION]... [LOADPROCEDURE]...
Run the LOADPROCEDURES in the database
-a DIR, --logdir_archive=DIR    directory to archive old log files
-e NUM, --errorthreshold=NUM   number of errors to allow during load
                               (overwrites procedure's default limit)
-l DIR, --logdir=DIR           directory to store logs
-r DIR, --configroot=DIR       configuration root directory
-f FILE NAME, --paramfile=FILE FILENAME of DB parameter file in CONFIGROOT
                               (similar to plexports.sh)
-rlo , --runloadonly          dont run pre and post step
-ne , --noexit                does not exit with a value
-h, --help                    display this help and exit
```

**bash pl\_stage\_file.sh** --controldir=<directory with control files> --logdir=<log output directory> <file containing standard interface-compliant BRM rule instances>

**bash pl\_load\_data.sh** --logdir=<log output directory>  
 "com.profitlogic.db.birch.LoadBRInstances"

The utility validates whether or not the instance key is a legal key at the specified level and whether the instance value is a legal value, as specified in the definition. If the validation fails, the procedure terminates and no changes are made.

Business rule definitions contained in config/businessrulemgr/rule\_definitions.xml are loaded using brmadmin.sh.

## Business Rule Property Manager Properties

BRPM properties may need to be configured prior to the deployment of the service. The properties are located in configroot/businessrulemgr/businessrulemgr.properties. The settings in this file can be overwritten by retailer settings.

**Table 3–3 Business Rule Property Manager Properties**

Property	Description	Default Value
numBrowsableMerchLevels	The number of merchandise hierarchy levels that can be browsed in the BRPM UI.	4
numBrowsableLocLevels	The number of location hierarchy levels that can be browsed in the BRPM UI.	2
numFindableMerchLevels	The number of additional merchandise hierarchy levels that can be accessed using the BRPM find feature.	2

**Table 3–3 (Cont.) Business Rule Property Manager Properties**

Property	Description	Default Value
numFindableLocLevels	The number of additional location hierarchy levels that can be accessed using the BRPM find feature.	1
numExpandableMerchLevels	The number of levels that the merchandise hierarchy can be expanded to in the BRPM UI.	4
numExpandableLocLevels	The number of levels that the location hierarchy can be expanded to in the BRPM UI.	3

## Guidelines for Setting BRPM Properties

Use the following guidelines in planning the configuration of the BRPM properties:

- The number of browsable merchandise hierarchy levels should equal the service merchandise hierarchy levels.
- The number of browsable location hierarchy levels should equal the service location hierarchy levels.
- The number of findable merchandise hierarchy levels should equal (the total number of merchandise levels – the number of browsable merchandise hierarchy levels).
- The number of findable location hierarchy levels should equal (the total number of location hierarchy levels – the number of browsable location hierarchy levels).
- The number of expandable merchandise hierarchy levels should equal the number of browsable merchandise hierarchy levels.
- The number of expandable location hierarchy levels should equal the number of browsable location hierarchy levels.

In addition, keep in mind that

- the BRPM validates that the total number of levels defined in the properties file does not exceed the number of levels defined in the database.
- to forestall performance or memory problems, set the number of levels in the properties file close to Class in the merchandise hierarchy.
- the default values for `common.hierarchy.cache.timeout.hour` in `configroot/suite/suite.properties` may need to be configured.

## Business Rule Property Manager Grid Configuration

For business rules such as `OUT_DT` that allow null values, a custom property must be added to the grid configuration.

```
<column-def>
  <key>OUT_DT</key>
  <column-def-properties type="date" display-type="date" db-column-name="name"
db-table-name="name" editable="true" sortable="true" orderable="true"
hideable="true"
groupId="GROUP_HEADER" visibility="never-visible"/>
  <custom-property name="convertZeroToNull" value="true" custom-type="display"/>
-> <custom-property name="allowNone" value="true" custom-type="display"/>
</column-def>
```

## Example Configuration

The INVENTORY\_TARGET business rule is configured to express the target inventory level as a percentage of sell-through. To change the inventory target so that it is expressed as the number of end inventory units, complete the following process.

1. In the INVENTORY\_TARGET business rule, configure the value Type as INT.

```
<RuleDefinition name="INVENTORY_TARGET"
  shortDescription="brm.rules.params.inventorytarget.label"
  longDescription="brm.rules.params.inventorytarget.description"
  readAction="BRM_PRICE_VIEW"
  editAction="BRM_PRICE_EDIT"
  <KeyLevel merchandiseLevel="DEFAULTLEVEL" locationLevel="DEFAULTLEVEL"
    matchAttribute1="N" matchAttribute2="N"/>
  <KeyLevel merchandiseLevel="WORKSHEET" locationLevel="WORKSHEET"
    matchAttribute1="N" matchAttribute2="N"/>
  <KeyLevel merchandiseLevel="OPTIMIZATION" locationLevel="OPTIMIZATION"
    matchAttribute1="N" matchAttribute2="N"/>
  <ValueDefinition valueType="INT" validationType="RANGE"
    shortDescription="brm.rules.value.inventorytarget.label"
    longDescription="brm.rules.value.inventorytargetdescription"
    allowNullValues="N"
    defaultValue="0">
    <Value ruleValue="0"/>
    <Value ruleValue="1000000000"/>
  </ValueDefinition>
</RuleDefinition>
```

2. To make INVENTORY\_TARGET an integer in the grid, set the BRPM grid configuration in configroot/businessrulemgr/client/grids/brm-column-list.xml as follows:

```
<column-def>
  <key>INVENTORY_TARGET</key>
  <column-def-properties type="integer" display-type="integer"
    db-column-name="name" db-table-name="name" editable="true"
    sortable="true" orderable="true" hideable="true" groupid="GROUP_HEADER"
    visibility="never-visible"/>
  <custom-property name="convertZeroToNull" value="true"
    custom-type="display"/>
</column-def>
```

3. Change the resources file so that the display label and the rule

description reflect the change from Sell Through Percent to Ending Inventory Units. The resources file is located in configroot/suite/resources/businessrulemgrResources.properties.

```
brm.rules.params.inventorytarget.label = End Inv Units
brm.rules.params.inventorytarget.description = The inventory target at the out
date as ending inventory units
```

4. Specify the following in p4pgui-config.xml:

```
<merchandise-maint-params endingInv-input-type="endingInvUnits">
```

5. Change the default configurations for INT\_MOD\_INV\_TARGET\_ST\_PERC and INT\_MOD\_INV\_TARGET\_END\_UNITS in the custom column file by commenting out or removing default definitions and un-commenting the alternative definitions for those columns.

6. Make the column INT\_MOD\_INV\_TARGET\_ST\_PERC uneditable, and make the column INT\_MOD\_INV\_TARGET\_END\_UNITS editable in the maintenance grid configuration files, p4p-maint-grid.xml and p4p-maint-grid-groups.xml.

7. Make the column INT\_MOD\_INV\_TARGET\_ST\_PERC uneditable, and make the column INT\_MOD\_INV\_TARGET\_END\_UNITS editable in the maintenance grid configuration file, p4p-maint-grid-flat.xml.
8. Edit and re-apply the ir.sql file. Inventory target in units is calculated for each item by the inventoryTarget column of ir\_business\_policy (and ir\_business-policy\_c). By default, it calculates a value via the sell through percent obtained from the BRPM. Change the code to use the value directly as the number of units:

```
TO_NUMBER(  
    getBRValue('INVENTORY_TARGET',  
        i.merchandise_id, i.location_id,  
        brm_attribute1, brm_attribute2))  
as inventorytarget,
```



---

# Inference Rules

Inference rules, which are customized for specific retailer configurations, are used by the COE model run.

This chapter contains the following sections:

- [Introduction](#)
- [Inference Rule Access](#)
- [Performance Tuning Recommendations](#)
- [Inference Rules Overview](#)
- [Inference Rule Descriptions](#)

## Introduction

Inference rules define queries specifying particular views into the database that provide customization points for Clearance Optimization Engine (COE). An inference rule corresponds to a specific business policy. For example, views define relevant dates and data and the values needed for model runs.

Inference rules define the interface between the data and the model. All data that is passed to the model is controlled by inference rules. In addition, much of the data that is passed to the ITEM\_DATA table is also controlled by inference rules.

COE is installed with default inference rules, provided in the **ir.sql** file, which is located in **config/db.config**. The **ir.sql** file is overwritten during every subsequent installation. If you are going to customize **ir.sql**, it is recommended that you create a copy of the changes in **config/db.config**. Keeping a copy of your customization can be helpful in troubleshooting. In addition, this will allow you to apply your changes to any upgrade, which is important, as the default inference rules can change between releases of the service.

Two scripts are available that you can use to apply the **ir.sql** to the database schema:

- **plconfiguredb.sh**, used by the installer
- **configdb.sh**, located in **config/db.config**

For example:

```
$ bash configdb.sh dbalias username password ir.sql
```

You can use **configdb.sh** to apply your **custom\_ir.sql** to the database.

Note that certain inference rule values can be managed via the Business Rule Property Manager (BRPM).

## Inference Rule Access

To obtain the best performance, you can configure how the Calculation Engine queries inference rules.

Inference Rules can be accessed in three different ways. The way inference rules are accessed is customizable and can impact performance. It is possible to process more than one item at a time; that is, it is possible to have fewer, larger queries.

The inference rule access strategy is configured in **delphi.properties**, as follows:

**Table 4–1 Inference Rule Access Configuration Settings**

Configuration Setting	Form of Where Clause in Query
strategy.activitydata=single	where item_id = 1234
strategy.activitydata=list	where item_id in (1234, 5678, ...n), where n is a value between 1,000 and 10,000.
strategy.activitydata=temptable	where item_id in (select from temp_table)

The access level can be configured for the following Inference Rules, which are a direct interface to the Calculation Engine:

**Table 4–2 Inference Rules Strategy Setting Names**

Inference Rule Name	Strategy Setting Name
IR_ACTIVITY_DATA	activitydata
IR_BUSINESS_POLICY	businesspolicy
IR_FORCED_MARKDOWNS	forcedmarkdowns
IR_ITEM_DATES	itemdates
IR_ITEM_PARAMETERS	itemparameters
IR_ITEM_PRICES	itemprices
IR_MARKDOWN_CALENDAR	markdowncalendar
IR_MODEL_VALUES	modelvalues
IR_PAST_TICKET_PRICES	pastticketprices
IR_PENDING_MARKDOWNS	pendingmarkdowns
IR_PLANNED_PROMOS	plannedpromos
IR_PRICE_LADDER	priceladder
IR_PRIOR_DISTRIBUTION	distribution

Most inference rules have a default strategy option of *list*. Here is an example of override settings for each of the inference rules listed in Table 4–3, "Inference Rules" that can be used in **delphi.properties** (see Table 4–1, "Inference Rule Access Configuration Settings").

```
strategy.activitydata=temptable
strategy.businesspolicy=list
strategy.forcedmarkdowns=list
strategy.itemdata=list
```

```

strategy.itemparameters=list
strategy.itemprices=list
strategy.markdowncalendar=list
strategy.modelvalues=list
strategy.pastticketprices=list
strategy.pendingmarkdowns=list
strategy.plannedpromos=list
strategy.priceladder=list
strategy.distribution=single

```

Note that some inference rules have interdependencies that can impact performance.

## Performance Tuning Recommendations

If you make changes to inference rules and performance during an optimization run or a What If simulation becomes slow, consider the following:

1. Check to see if that the Database is fully loaded and that the CPU is being fully utilized
2. Use a Database Monitoring software tool such as TOAD to check the active sessions in the database
3. Typically, *n* number of connections are visible in the database. Are all the connections sitting on the same query? If so, the query is a bottleneck for the throughput of the run.
4. If the query is accessing an inference rule using an access strategy of list or temptable and is taking too long, try changing the access strategy.

Note that the single access strategy will provide reasonable but not optimum performance. The list and temptable strategies are recommended for optimum performance.

## Inference Rules Overview

Inference rules provide information used in the optimization run, such as item data, business constraints, and model parameters. Some of these generally require customization and others do not.

In some cases, two versions of an inference rule exist: IR\_NAME and IR\_NAME\_C. The IR\_NAME form is used when a item is optimized individually and the IR\_NAME\_C form is used when the item is optimized as part of a pricing group. In certain cases, pricing groups require special behavior and the inferences rules provide the means to accomplish this (for example, to align outdates in IR\_ITEM\_DATES\_C). Some IR\_NAME\_C inference rules contain a COLLECTION\_ID.

This section describes a subset of the COE inference rules.

**Table 4–3 Inference Rules**

<b>Inference Rule Name</b>	<b>Discussed On...</b>
<i>Inference Rules that are part of the basic configuration and that are typically customized.</i>	
IR_ITEM_PRICES and IR_ITEM_PRICES_C	on page 4-14
IR_ITEM_DATES and IR_ITEM_DATES_C	on page 4-13
IR_MODEL_START_OPTION	on page 4-16
IR_MODEL_START	on page 4-16
IR_SEASONALITY_ATTRIBUTE	on page 4-22
IR_PENDING_MARKDOWNS	on page 4-19
<i>Inference rules that are part of business policies and that are typically customized.</i>	
IR_BUSINESS_POLICY and IR_BUSINESS_POLICY_C	on page 4-6
IR_MARKDOWN_CALENDAR	on page 4-15
IR_BLOCKED_MARKDOWN and IR_BLOCKED_MARKDOWN_C	on page 4-6
IR_MARKDOWN_CALENDAR_EX and IR_MARKDOWN_CALENDAR_EX_C	on page 4-15
IR_PRICE_LADDER and IR_PRICE_LADDER_C	on page 4-21
IR_PLANNED_PROMOS	on page 4-19
IR_COLLECTION_INFO	on page 4-8
<i>Inference rules that are provided by Analytical Services.</i>	
IR_ITEM_BASE_DEMAND	on page 4-11
IR_ITEM_PARAMETERS	on page 4-14
IR_MODEL_VALUES	on page 4-17
IR_PLANNED_PROMOS	on page 4-19
IR_STATE_TRANS_CONFIG_OVERRIDE	on page 4-22
IR_STATE_TRANS_PREV_RUN	on page 4-22
<i>Inference rules that are typically not changed.</i>	
IR_ACTIVITY_DATA	on page 4-6
IR_PAST_TICKET_PRICES	on page 4-18
IR_ITEM_IDS and IR_ITEM_IDS_C	on page 4-14
IR_ELIGIBLE	on page 4-10
<i>Inference rules that make information are used during the KPI calculations. These inference rules populate the ITEM_DATA table.</i>	
IR_FRONT_END_IDS	on page 4-10
IR_ITEM_DATES	on page 4-13
IR_ITEM_PRICES	on page 4-14
IR_WAREHOUSE	on page 4-23
IR_COLLECTION_INFO	on page 4-8
IR_USER_TEXTS	on page 4-22

**Table 4–3 (Cont.) Inference Rules**

<b>Inference Rule Name</b>	<b>Discussed On...</b>
IR_USER_DATES	on page 4-22
IR_USER_FLOATS	on page 4-22
IR_WORKSHEET_IDS	on page 4-23
<i>Inference rules that use forecast and markdown recommendation information and that populate the ITEM_DATA table.</i>	
IR_FORECAST_METRICS	on page 4-10
IR_PROJ_MKDNS	on page 4-21
IR_O_USER_TEXTS	on page 4-18
IR_O_USER_DATES	on page 4-17
IR_O_USER_FLOATS	on page 4-17
<i>Inference rules used to configure Pricing Groups.</i>	
IR_ITEM_COLLECTION_OPTION	on page 4-11
IR_ITEM_COLLECTION	on page 4-11
<i>Inference rules used by What If.</i>	
WIF_FORECAST_DATA	on page 4-23
<i>Additional inference rules.</i>	
IR_ITEM_DAILY_WEIGHTS_OVERRIDE	on page 4-12
IR_ITEM_INFO and IR_ITEM_INFO_C	on page 4-14
IR_MERCHANDISE_HIERARCHY	on page 4-16
IR_LOCATION_HIERARCHY	on page 4-15
IR_HISTORIC_METRICS	on page 4-10
IR_METRICS	on page 4-16
IR_ROLLUPS	on page 4-21
IR_SEASON_METRICS	on page 4-22
IR_DISPLAY_PROMOS	on page 4-8
IR_FE_WAREHOUSE	on page 4-10
IR_PRIOR_DISTRIBUTION	on page 4-21
IR_FORCED_MARKDOWNS	on page 4-10
IR_MISSING_WEEKS	on page 4-16
IR_P4P_ITEMS_CONFIG	on page 4-18
IR_FORECAST_METRICS_POSTRUN	on page 4-10
IR_LOC_OPT_LEVEL	on page 4-15
IR_MERCH_OPT_LEVEL	on page 4-16
IR_PROCESS_NULL_OUTDT	on page 4-21

## Inference Rule Descriptions

This section provides details about the inference rules listed in the above table. This list of inference rules is in alphabetical order.

**IR\_ACTIVITY\_DATA**

The IR\_ACTIVITY\_DATA inference rule provides all the historical sales activity, beginning with the start date for an item, to the model. The data is loaded on a weekly basis, by week. The view assumes that a week with zero sales is valid for forecasting. A Scenario\_ID column is included for use with What If.

The field values for Interpretation are:

- 0 = permanent price
- 1 = start of new markdown
- 4 = a price that has not yet been set

**IR\_BLOCKED\_MARKDOWN and IR\_BLOCKED\_MARKDOWN\_C**

The IR\_BLOCKED\_MARKDOWN inference rule is used to indicate the reasons that markdowns are blocked on effective dates. (The exclusion of candidate dates is controlled by IR\_MARKDOWN\_CALENDAR and the reason for the exclusion is indicated here.) A Scenario\_ID column is included for use with What If.

See IR\_MARKDOWN\_CALENDAR\_EX for related information.

**IR\_BUSINESS\_POLICY and IR\_BUSINESS\_POLICY\_C**

The IR\_BUSINESS\_POLICY inference rule provides business constraint information, such as markdown depth and salvage details, that is used by the model run. It looks up most of the values used by the Business Rule Property Manager.

It should produce one row per item to be forecast or optimized in a model run. You will see model configuration errors during a model run if values are incorrect.

For What If, use the scenario\_ID to obtain New\_Inventory\_Target and New\_Salvage\_Above\_Target from WIF\_SCENARIO\_TBL.

This inference rule has the following columns:

- Item\_ID – the ID of the specified item.
- MinMarkdownInterval – the number of days required between markdowns. This is managed by the NO\_TOUCH\_AFTER\_MKDN business rule.
- MinMarkdownPercentOfFullPrice – the minimum markdown, expressed as a percentage of the original full retail price.
- MaxFirstMarkdownPercentage – the maximum amount for the first markdown, expressed as a percentage of the current permanent price (ticket price). This is managed by the MAX\_FIRST\_MKDN business rule.
- MaxNumberMarkdowns – The total number of markdowns an item can receive during its life cycle. This is managed by the MAX\_MKDN\_NO business rule.
- NoMarkdownInPromo – a value, not used by default, that can be used by IR\_MARKDOWN\_CALENDAR or IR\_MARKDOWN\_CALENDAR\_EX to trigger the elimination of markdown dates that are scheduled during a promotion.
- PromoCeiling – Not used by default. The value can be used by IR\_PLANNED\_PROMOS to affect Promo Type (interpretation).
- InventoryTarget – the number of items expected to remain unsold by the out-of-stock date (also called outdate or exit date). This is managed by the INVENTORY\_TARGET business rule as a sell-through percent. The sell-through percent is used to calculate the value for the number of items.
- TargetSellThru – the fraction of inventory that the service should try to sell.

- **SalvageValueAboveTarget** – the value of an item when the inventory target is not met, expressed as a dollar amount. This is managed by the SALVAGE\_ABOVE\_TARGET business rule. The dollar amount is used to calculate the salvage value as a percentage of the full retail price.
- **SalvageAboveTargetPercent** – the salvage value for unsold items above the sell-through target.
- **SalvageValueWithTarget** – the value of an item when the inventory target is met, expressed as a dollar amount. This is managed by the SALVAGE\_WITHIN\_TARGET business rule. The dollar amount is used to calculate the salvage value as a percentage of the full retail price. The value is used by IR\_PRICE\_LADDER.
- **DaysAfterLand** – the minimum number of days after the first optimization date before the item is eligible for a markdown. This is managed by the NO\_TOUCH\_AFTER\_LAND business rule. It is used by IR\_MARKDOWN\_CALENDAR to eliminate some potential markdown dates for optimizations.
- **NoMarkdownOnEffective** – used by IR\_MARKDOWN\_CALENDAR or IR\_MARKDOWN\_CALENDAR\_EX to eliminate a specific recommended date as an effective markdown date. This value is not a default value.
- **MaxMarkdownPercentOfFullPrice** - the maximum markdown, expressed as a percentage of the original full retail price. This is used by IR\_PRICE\_LADDER to trim the list of candidate prices available to the optimization.
- **StockoutLevel** – used to determine whether or not the inventory target has been met, for purposes of applying salvage targets. The value is expressed in units and is typically set to 0.
- **MaxAbsolutePrice** – not implemented. Set to 1.
- **MarkdownDayOfWeek** – can be used by IR\_ITEMS\_DATES and IR\_MARKDOWN\_CALENDAR to indicate the day of the week that is the markdown day.
- **DaysBeforeOutdate** – used by IR\_MARKDOWN\_CALENDAR or IR\_MARKDOWN\_CALENDAR\_EX to eliminate a specific recommended markdown date that is close to the outdate. This value is not a default value.
- **MinFirstMarkdownPercentage** – the minimum amount for the first markdown, expressed as a percentage of the current permanent price (ticket price). This is managed by the MIN\_FIRST\_MKDN business rule.
- **MinSubseqMarkdownPercentage** – the minimum amount for every markdown after the first one, expressed as a percentage of the current permanent price (ticket price). This is managed by the MIN\_OTHER\_MKDN business rule.
- **MaxSubseqMarkdownPercentage** – the maximum amount for every markdown after the first one, expressed as a percentage of the current permanent price (ticket price). This is managed by the MAX\_OTHER\_MKDN business rule.
- **TempMarkdownsBlock** – Used to indicate whether to consider temporary markdowns when calculating MaxNewMarkdowns and when making decisions based on MinMarkdownInterval.
- **PosMarkdownsBlock** – Used to indicate whether to consider POS markdowns when calculating MaxNewMarkdowns and when making decisions based on MinMarkdownInterval.
- **Scenario\_ID** – 0 for optimization run; all other values identify a specific What If scenario.

**IR\_COLLECTION\_INFO**

The IR\_COLLECTION\_INFO inference rule defines information about each pricing group. For the optimization run, it uses Collection\_Pricing to specify the pricing group pricing rule. The three pricing rules are:

- Price-together – the pricing recommendations for the items in a group are to the same price points
- Percent-together – the pricing recommendation for the items in a group are to the same percentage off
- Markdown-together – the items in a group are marked down together

This inference rule has the following columns:

- Collection\_ID
- Collection\_Client\_ID
- Collection\_Desc
- Parent\_Collection\_ID
- Land\_Dt
- Out\_Dt
- Clearance\_Ind\_Dt
- Price\_Ladder\_ID
- Clr\_Price\_Ladder\_ID
- Collection\_Type – This specifies the business constraints on the markdown recommendations for items in a pricing group, as follows:
  - PriceTogether – all items in a pricing group must be markdown down to the same dollar value.
  - PercentOffTogether – all items in a pricing group must be marked down to the same percentage off the original retail price.
  - MarkdownTogether – all items in a pricing group must be marked down, but the markdown prices have no defined relationship with each other.
- Parent\_Collection\_Desc
- Parent\_Client\_ID
- Collection\_Pricing
- Is\_A\_Front\_End\_Collection
- Front\_End\_Collection\_ID

**IR\_DISPLAY\_PROMOS**

The IR\_DISPLAY\_PROMOS inference rule lists the information about promotions. It is based on IR\_PLANNED\_PROMOS, with differences as noted below.

This inference rule has the following columns:

- Item\_ID – the ID of the item affected by the promotion.
- Price – the promotion price (not the relative price).
- Interpretation – the type of promotion. Interpretation affects the business rules that apply to a given promotion. The business rules affect the legality of the markdowns in the vicinity of the promotion.

The possible values for interpretation are:

- Promo\_Floor (2) – a floor promotion.
- Promo\_Ceiling (3) – a ceiling promotion.
- Promo\_Unrestricted (9) – a promotion that has no restrictions.
- StartDate – unlike in IR\_PLANNED\_PROMOS, this start date includes all promotions.
- EndDate – the actual end date (not end\_dt + 1)
- Priority – a value used to prioritize all the promotions of a given type in order to eliminate any possible conflicts. The default value is 2.

The actual precedence rules used to determine the promotion used are:

1. Floor promos win
  2. Lowest price
- Lift – the effect of an external event, such as advertising, on sales when a promotion is in effect. Used in forecasting. A multiplier applied to the demand.
  - LiftType – used to define the lift. The possible values for lift are:
    - Base (0) – for base media lifts.
    - Relative (1) – for relative media lifts.
    - POS (2) – for percent-off events that are independent of markdown status.
    - Additional (3) – for percent-off events. Applicable only to items that have had one or more markdowns.
    - No\_Markdown (4) – for percent-off events. Applicable only to items that have had no markdowns.
    - First\_Markdown (5) – for percent-off events. Applicable only to items that have had one markdown.
    - Multiple\_Markdown (6) – for percent off events. Applicable only to items that have had two or more markdowns.

Base and relative are used for combining media effects. The lift on a given day is computed by multiplying max (Base lifts) and max (Relative lifts). POS, Additional, No\_Markdown, First\_Markdown, and Multiple\_Markdown are all used for point-of-sale promotions. In these promotions, the sales price is calculated by taking a percent off the ticket price. The percent off is specified in the service field as a relative price. So, 35 % off means a relative price of 0.65. The promotional price is triggered only if the specified Lift Type conditions apply.

A POS means that the discount is taken in addition to lowest permanent (list or markdown, but not promotion or clearance) price. Additional means that the discount is taken in addition to the lowest permanent (markdown, but not promotion or clearance) price. The Interpretation for either POS, Additional, No\_Markdown, First\_Markdown, and Multiple\_Markdown promotions should be set to PROMO\_UNRESTRICTED.

- Promo\_Desc – a description of the promotion.
- Promo\_Pct\_Off – the actual value (not 1 - Promo\_Pct\_Off).
- Promo\_Type – the type of promotion
- Promo\_Number – the number identifying the promotion

- Attributes 1-5 – variable attributes
- Week\_End\_Date – the date for the last day of the week

**IR\_ELIGIBLE**

The IR\_ELIGIBLE inference rule is used to provide a list of the eligible items and eligible pricing groups to the optimization run. Eligibility is defined and customized via the load statements.

**IR\_FE\_WAREHOUSE**

The IR\_FE\_WAREHOUSE inference rule references the IR\_WAREHOUSE view. It lists the warehouse on-hand and on-order units for an item.

**IR\_FORCED\_MARKDOWNS**

The IR\_FORCED\_MARKDOWNS inference rule defines the markdown level an item is required to have. If the item has not reached the defined markdown level by the scheduled time, then a markdown will be forced even if it is not desirable, or the opportunity cost will be zero.

**IR\_FORECAST\_METRICS**

The IR\_FORECAST\_METRICS inference rule contains a list of forecasted metrics.

This inference rule has the following columns:

- Ending\_Inventory\_Units
- EOL\_Cum\_Unit\_Sales
- EOL\_Cum\_Dollars\_Sales
- Weekly\_Projected\_Unit\_Sales
- Weekly\_Projected\_Dollar\_Sales
- Weekly\_Projected\_Sales\_Price
- Projected\_Out\_of\_Stock
- Rec\_Rtl\_Min
- Forecast\_ID

**IR\_FORECAST\_METRICS\_POSTRUN**

For What If, the scenario\_ID is specified in internal queries. Used for updating ITEM\_DATA in the POSTRUN step.

**IR\_FRONT\_END\_IDS**

The IR\_FRONT\_END\_IDS inference rule provides the Store\_ID, Merchandise\_ID, Ladder\_ID, and Current\_Ladder\_ID associated with an item in the ITEM\_DATA table.

**IR\_HISTORIC\_METRICS**

The IR\_HISTORIC\_METRICS inference rule lists the following historic metrics:

- Cumulative quantity sold
- Cumulative sales dollars
- Current on order dollars
- Inventory cost

- Current units on order
- Start sell date
- Week-minus-1 units on hand
- Week-minus-2 units on hand
- Week-minus-3 units on hand
- Unit sales through week
- Unit sales week-minus-1
- Unit sales week-minus-2
- Unit sales week -minus-3
- Dollar sales through week
- Dollar sales week-minus-1
- Dollar sales week-minus-2
- Dollar sales week-minus-3

#### **IR\_ITEM\_BASE\_DEMAND**

The IR\_ITEM\_BASE\_DEMAND inference rule is used by Analytical Services to apply (or override) a demand strategy to historical sales.

This inference rule has the following columns:

- Item\_ID – identifies the item.
- Base\_Demand – the external base demand value, which must be positive, or it will be ignored.
- Base\_Demand\_Usage – must have a value of either Override or Floor. If set to Override, it overrides the internal base demand calculated by the Calculation Engine and uses the external base demand calculation. If set to Floor, the internal value is used.

#### **IR\_ITEM\_COLLECTION**

The IR\_ITEM\_COLLECTION inference rule defines how items are grouped into pricing groups.

This inference rule has the following columns:

- Item\_ID
- Merchandise\_ID
- Location\_ID
- Collection\_Client\_ID
- Collection\_Desc

This inference rule can be configured with a custom list of excluded/included items. It works in combination with IR\_ITEM\_COLLECTION\_OPTION.

#### **IR\_ITEM\_COLLECTION\_OPTION**

The IR\_ITEM\_COLLECTION\_OPTION inference rule includes a flag by default set to *N*, which indicates that the pricing groups are managed at the level of optimization. The *Y* flag is used to indicate pricing group management at the Chain level (optimization is still at the item level).

**IR\_ITEM\_DAILY\_WEIGHTS\_OVERRIDE**

The IR\_ITEM\_DAILY\_WEIGHTS\_OVERRIDE inference rule provides daily weights that override the default daily weights for an item. The Calculation Engine uses daily weights in combination with the weekly forecasted sales units to determine daily forecasts.

IR\_ITEM\_DAILY\_WEIGHTS\_OVERRIDE has 8 columns: ITEM\_ID, SUNDAY\_WT, MONDAY\_WT, TUESDAY\_WT, WEDNESDAY\_WT, THURSDAY\_WT, FRIDAY\_WT, and SATURDAY\_WT to accommodate a weight for each weekday and for each item whose daily weights need to be overridden. By default, this view has no records, so no daily weights are overridden.

**Table 4–4 Default Daily Weight Values**

Day of Week	Default Daily Weight Value
Sunday	0.2
Monday	0.1
Tuesday	0.1
Wednesday	0.1
Thursday	0.1
Friday	0.2
Saturday	0.2

The view is not required to have any record unless daily weights need to be overridden for some items. For items that do not have record in the view, the Calculation Engine will apply the default daily weights.

To override the daily weights of an item, this view must contain exactly one record for the ITEM\_ID. The Calculation Engine checks the validity of the daily weight record in two steps:

First, the weight for each weekday must be a non-negative double value, and weights for the same item must add up to 1. If any weekday has a negative value or a NULL value, or the values do not add up to 1, the Calculation Engine will throw a "badDailyWeightsOverride" error and will not generate a forecast or markdown recommendation.

Second, the daily weights are compared with the historic data. If a particular weekday has a daily weight value of 0, but the historic daily sales on the same weekdays do not have a value of 0, the Calculation Engine will throw a "badSeasonality" error. However, the Calculation Engine does allow the daily weight and the daily sales on the same weekday to both have a value of 0 at the same time; in this case, it will forecast zero sales on the same weekday.

Here is the default ir\_item\_daily\_weights\_override from ir.sql:

```
CREATE VIEW IR_ITEM_DAILY_WEIGHTS_OVERRIDE
(
  ITEM_ID,
  SUNDAY_WT,
  MONDAY_WT,
  TUESDAY_WT,
  WEDNESDAY_WT,
  THURSDAY_WT,
  FRIDAY_WT,
  SATURDAY_WT
```

```

)
AS
SELECT
    i.item_id,
    0.2 as SUNDAY_WT,
    0.1 as MONDAY_WT,
    0.1 as TUESDAY_WT,
    0.1 as WEDNESDAY_WT,
    0.1 as THURSDAY_WT,
    0.2 as FRIDAY_WT,
    0.2 as SATURDAY_WT
FROM
    items_tbl i
WHERE i.end_dt IS NULL
AND 1 = 0
%{YA_TD}%

```

Here is an example of a customized version of the view in which all the items share the same daily weights that are different from the default ones.

```

CREATE VIEW IR_ITEM_DAILY_WEIGHTS_OVERRIDE
(
    ITEM_ID,
    SUNDAY_WT,
    MONDAY_WT,
    TUESDAY_WT,
    WEDNESDAY_WT,
    THURSDAY_WT,
    FRIDAY_WT,
    SATURDAY_WT
)
AS
SELECT
    i.item_id,
    0.0 as SUNDAY_WT,
    0.1 as MONDAY_WT,
    0.1 as TUESDAY_WT,
    0.2 as WEDNESDAY_WT,
    0.1 as THURSDAY_WT,
    0.2 as FRIDAY_WT,
    0.3 as SATURDAY_WT
FROM
    items_tbl i
WHERE i.end_dt IS NULL;

```

### **IR\_ITEM\_DATES and IR\_ITEM\_DATES\_C**

The IR\_ITEM\_DATES inference rule defines a set of intervals, beginning with the start date and ending with the outdate. StartDate is defined as Sunday by default.

For What If, use the scenario\_ID to obtain New\_Out\_Dt from WIF\_SCENARIO\_TBL.

This view assumes an updated ITEMS\_BRM\_RULES table that contains current outdate values.

Note that days of the week must be aligned correctly or errors will result.

This inference rule has the following columns:

- ItemID – identifies the item the dates apply to.

- **StartDate** – the first date that an item is considered to be available for sale. It is not the date on which the item arrives in the store or the date of the first sale. It can be calculated based on sales or it can be supplied directly from the retailer through a data feed.
- **StartSimulationDate** – the date on which the simulation starts, which is defined by default by adding one day to the last day of historical activity. The last day of history is always a Saturday, which is the last day that the service has the sales data from the retailer.
- **EffectiveDate** – the date on which a new markdown recommendation from the run can be applied to the item. This date is generally the one on which the new markdown is possible, given the production cycle. It is usually x days after the last day of history. Some retailers may have varying effective dates for different departments.
- **OutDate** – the date on which all items are sold or the target inventory value is met. The value for OutDate in IR\_ITEM\_DATE and IR\_ITEM\_DATE\_C must be aligned. The use of ITEMS\_MODELRUN\_TBL for outdates is not appropriate.
- **DB\_Last\_Actual\_Date** – the last day of historical activity.
- **Scenario\_ID** – 0 for optimization run; all other values identify a specific What If scenario.

#### **IR\_ITEM\_IDS and IR\_ITEM\_IDS\_C**

The IR\_ITEM\_IDS inference rule provides a set of IDs that are associated with an item.

This inference rule has the following columns:

- **Item\_ID** – identifies the item.
- **Collection\_ID** – used only with IR\_ITEMS\_IDS\_C.
- **Merchandise\_ID** – used in association with the Location\_ID to identify an item.
- **Location\_ID** – used in association with the Merchandise\_ID to identify an item.
- **Price\_Ladder\_ID** – identifies the price ladder associated with an item.
- **Seasonality\_ID** – uses the seasonality attribute value, which identifies the seasonality curve for the item, and that is defined in IR\_SEASONALITY\_ATTRIBUTE.

#### **IR\_ITEM\_INFO and IR\_ITEM\_INFO\_C**

The IR\_ITEM\_INFO inference rule shows basic information about an item, including price and date. This view references IR\_ITEM\_DATES and IR\_ITEM\_PRICES. For What If, scenario\_ID is specified in internal queries.

#### **IR\_ITEM\_PARAMETERS**

The IR\_ITEM\_PARAMETERS inference rule defines the analytical parameters used in a forecast and are provided by Analytical Services. This view includes the following columns: Item\_ID, Gamma, CriticalInventory, ZeroInventoryEffect, Demand\_Uncertainty, Model, Demand\_Strategy, Demand\_Intervals, MaxNewMarkdowns, Alpha, Beta, PriceEffect, InSeasonDistribution, InSeasonParameter, UseInternalPrior, and InternalPriorBias.

#### **IR\_ITEM\_PRICES and IR\_ITEM\_PRICES\_C**

The IR\_ITEM\_PRICES inference rule provides the basic set of prices for each item. One row must exist for each item (an eligible item) run through the model. The Perm\_

Ticket\_Price only reflects markdowns from optimization runs, not from What If calculations. The value should be the ticket price as of the effective date.

The view contains “scenario\_id=0” to ensure that What If data is not accessed.

Note that the “item does not exist” error is primarily caused by a failure in this query.

This inference rule has the following columns:

- Item\_ID
- Full\_Price
- Ticket\_Price
- Perm\_Ticket\_Price
- Current\_Inv\_Price
- Avg\_Cost

### **IR\_LOC\_OPT\_LEVEL**

This inference rule provides the location optimization level, as defined in the Cross Products Information Standard Interface.

### **IR\_LOCATION\_HIERARCHY**

The IR\_LOCATION\_HIERARCHY defines an item’s location hierarchy.

### **IR\_MARKDOWN\_CALENDAR**

The IR\_MARKDOWN\_CALENDAR inference rule defines the markdown calendar for an item. These dates are used during an optimization. The view can be used, for example, to trim the calendar so that there are no markdowns during the last weeks. (The item dates view and the markdown calendars view share common logic.)

See IR\_MARKDOWN\_CALENDAR\_EX for related information. This view is necessary when a popup message explaining the exclusion is needed.

This rule produces zero or more rows representing recommended markdown dates. If the eligible effective date is not available, or if this view returns zero rows, then markdowns are not recommended. Markdowns can only be recommended if available effective dates are provided by this view. The dates are based on the weekly calendar provided by the retailer. It uses IR\_BUSINESS\_POLICY and IR\_PLANNED\_PROMOS to apply restrictions to the set of recommended dates. Additional restrictions may also be applied, based on IR\_MARKDOWN\_CALENDAR\_EX.

For What If, use the scenario\_ID to obtain the New\_Blackout\_End from WIF\_SCENARIO\_TBL.

This inference rule has the following columns:

- ItemID – the ID of the item being marked down.
- CalendarDate – the date of the candidate markdown. This should be between the effective date and the outdate.
- Scenario\_ID – 0 for optimization run; all other values identify a specific What If scenario.

### **IR\_MARKDOWN\_CALENDAR\_EX and IR\_MARKDOWN\_CALENDAR\_EX\_C**

The IR\_MARKDOWN\_CALENDAR\_EX inference rule defines the dates that are excluded from the standard markdown calendar. It excludes dates from IR\_MARKDOWN\_CALENDAR and provides reason codes for the exclusion to IR\_

BLOCKED\_MARKDOWN. The view uses resource IDs to describe the reason for the exclusion, so use only properly defined resources. A Scenario\_ID column is included for use with What If.

### **IR\_MERCH\_OPT\_LEVEL**

This inference rule provides the merchandise optimization level, as defined in the Cross Products Information Standard Interface.

### **IR\_MERCHANDISE\_HIERARCHY**

The IR\_MERCHANDISE\_HIERARCHY inference rule defines an item's merchandise hierarchy.

### **IR\_METRICS**

The IR\_METRICS inference rules lists the following metrics:

- Unit cost
- MTD net sales units
- MTD net sales amount
- STD net sales units
- STD net sales amount

### **IR\_MISSING\_WEEKS**

The IR\_MISSING\_WEEKS inference rule defines the weeks in an item's history that are missing activities. An item should have, at a minimum, history from its start date to the last day of history. A Scenario\_ID column is included for use with What If.

### **IR\_MODEL\_START**

The IR\_MODEL\_START inference rule is used when the IR\_MODEL\_START\_OPTION is defined as custom. It defines the model start date for items and produces one row per item.

This inference rule has the following columns:

- Item\_ID – identifies the item.
- Model\_Start\_Dt – the first date that the item is available for sale.

### **IR\_MODEL\_START\_OPTION**

The IR\_MODEL\_START\_OPTION inference rule is used to configure the Option and Threshold (when necessary) settings to determine the model start date (the first possible sale date for an item) used for optimizations. This inference rule produces a single row containing a global setting. This view should be used for configuring Option and Threshold for setting Model\_Start\_Dt in ITEMS\_TBL. (Model\_Start\_Dt is always represented as the first day of the week preceding the actual computed date. It is loaded using LoadModelStartDate, which is part of plfrontendload.sh (FELOAD).)

This inference rule has the following columns:

- Model\_Start\_Option – the value must be one of the following:
  - inventoryRatio – (inventory/cumulative\_sales\_to\_date + inventory + on\_order) above a defined Threshold.
  - storeRatio – (stores\_with\_inventory/stores\_in\_region) above a defined Threshold.

- plannedStart – the default. No threshold value needed.
- custom – derives the value from IR\_MODEL\_START. No threshold value needed.
- sellThrough – used when Model Start Sell Through Pct is used to determine the model start date. When this option is selected, then a value (Y or N) must be provided for Recalc, Use\_StoreOH\_Inv, Use\_StoreOO\_Inv, Use\_DCOH\_Inv, and Use\_DCOO\_Inv.

If the value of either Use\_StoreOH\_Inv, Use\_StoreOO\_Inv, Use\_DCOH\_Inv, and Use\_DCOO\_Inv is set to Y (the default), then the specified value for that parameter is used in the calculation of the Model Start Date. The total inventory is calculated by summing the store and distribution center inventories. Most retailers use the following combinations:

- \* Store On Hand + Store On Order
- \* Store On Hand + Store On Order + DC On Hand
- \* Store On Hand + Store On Order + DC On Hand + DC On Order

Note that if the Sell Through option is used, then the three business rules, MSD\_FORCED\_START\_DT, MSD\_SELLTHROUGH\_PCT, and MSD\_MAX\_DELAY\_WK, must be configured.

- Threshold – the numeric value of the threshold, for inventoryRatio and storeRatio only. This value must be between 0 and 1.
- Recalc – used to indicate that a recalculation will be used. The default value is Y.
- Use\_StoreOH\_Inv – the value for Store On Hand Inventory is used in the calculation of Model Start Date. The default value is Y.
- Use\_StoreOO\_Inv – the value for Store On Order Inventory is used in the calculation of Model Start Date. The default value is Y.
- Use\_DCOH\_Inv – the value for DC On Hand Inventory is used in the calculation of Model Start Date. The default value is Y.
- Use\_DCOO\_Inv – the value for DC On Order Inventory is used in the calculation of Model Start Date. The default value is Y.

### **IR\_MODEL\_VALUES**

The IR\_MODEL\_VALUES are provided by Analytical Services.

### **IR\_O\_USER\_DATES and IR\_O\_USER\_DATES\_C**

The IR\_O\_USER\_DATES inference rule defines six date values per item per run ID, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast and markdown information.

This inference rule has the following columns:

- Item ID – identifies the item
- User date columns as appropriate

### **IR\_O\_USER\_FLOATS and IR\_O\_USER\_FLOATS\_C**

The IR\_O\_USER\_FLOATS inference rule defines twelve numeric values per item per run ID, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast and markdown information.

This inference rule has the following columns:

- Item ID – identifies the item
- User float columns as appropriate

#### **IR\_O\_USER\_TEXTS and IR\_O\_USER\_TEXTS\_C**

The IR\_O\_USER\_TEXTS inference rule defines four text values per item per run ID, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast and markdown information.

This inference rule has the following columns:

- Item\_ID – identifies the item
- User text columns as appropriate

#### **IR\_P4P\_ITEMS\_CONFIG**

This inference rule provides a single point of configuration for markdown information. The initial definition of the view is a pass through to the P4P\_ITEMS view.

The IR\_P4P\_ITEMS\_CONFIG has the following columns:

- Item\_ID
- Submittal\_Worksheet\_ID
- Markdown\_Flag
- Recommended\_Retail\_Price
- Taken\_Price

The initial definition of the view is a pass through to the p4p\_items view.

The markdown\_flag column accepts the following values:

- 0 – markdown not taken
- 1 – markdown taken to item recommended price
- 2 – markdown taken to pricing group recommended price
- 3 – markdown taken to modified price
- 4 – markdown taken due to optimization to budget
- 5 – markdown taken due to What If

#### **IR\_P4P\_MARKDOWN\_ACTIVITIES**

The IR\_P4P\_MARKDOWN\_ACTIVITIES inference rule is used to return markdown activities to What If that match the forecasts in P4P\_FORECAST\_DATA. These forecasts reflect whether pricing groups or items were used in the model run, so this view keeps What If consistent.

#### **IR\_PAST\_TICKET\_PRICES**

The IR\_PAST\_TICKET\_PRICES inference rule provides a ticket price history to the model. This information is used to determine the number of markdowns that have already occurred, the date of the last markdown, and the starting ticket price for the forecast. A Scenario\_ID column is included for use with What If.

The field values for interpretation are:

- 0 = permanent price

- 1 = start of new markdown
- 4 = unknown price

### **IR\_PENDING\_MARKDOWNS**

The IR\_PENDING\_MARKDOWNS inference rule defines markdowns that have already been accepted but are still in the forecast range and so should be taken into account by the forecast. Markdowns from two different sources are included:

- historic markdowns, taken during previous weeks, that are not yet in the sales history
- markdowns proposed by What If

This view handles markdowns and any pending price changes. The view returns the relative price as taken from the full price (or the current ticket price if the interpretation is 3). It is a multiplier applied to the original retail (full) price for the PERM and TEMP interpretations, and to the current ticket price for the POS interpretation.

This may require customization so that Start\_Dt occurs on the correct date.

Temporary markdowns are flagged to distinguish them from POS markdowns.

For What If, use the scenario\_ID to obtain Item\_Markdowns from WIF\_ITEM\_MARKDOWN\_TBL.

This inference rule has the following columns:

- ItemID – identifies the item associated with the markdown.
- StartDate – the effective date of the markdown.
- Price – the relative price, a multiplier that is applied to the original retail price (full price) for interpretations 1 and 2 and to the current ticket price for interpretation 3.
- Interpretation – Permanent markdown = 1. Temporary markdown = 2. POS markdown = 3.
- Scenario\_ID – 0 for optimization run; all other values identify a specific What If scenario.

### **IR\_PLANNED\_PROMOS**

The IR\_PLANNED\_PROMOS inference rule defines the characteristics of all future planned temporary markdowns and the associated expected lift for each item. In the forecasted range, this is used to determine the current selling price and to implement floor and ceiling restrictions on markdowns. Promotions with lifts are determined based on a historical analysis of an item's demand.

A Scenario\_ID column is included for use with What If. The value returned by this view does not vary by scenario ID. The view depends on IR\_ITEM\_DATES and IR\_PENDING\_MARKDOWNS (via IR\_ITEM\_PRICES). These two views do contain override logic. IR\_PLANNED\_PROMOS does not depend on fields that vary with What If. The Scenario\_ID column is included in this view to provide robustness during customization.

This inference rule has the following columns:

- Item\_ID – the ID of the item affected by the promotion.
- Price – the relative price. Price affects demand according to the price effect function.

- Interpretation – the type of promotion. Interpretation affects the business rules that apply to a given promotion. The business rules affect the legality of the markdowns in the vicinity of the promotion.

The possible values for interpretation are:

- Promo\_Floor (2) – a floor promotion.
- Promo\_Ceiling (3) – a ceiling promotion.
- Promo\_Unrestricted (9) – a promotion that has no restrictions.
- StartDate – the date on which the promotion will begin.
- EndDate – the date on which the promotion will end.
- Priority – a value used to prioritize all the promotions of a given type in order to eliminate any possible conflicts. The default value is 2.

The actual precedence rules used to determine the promotion used are:

1. Floor promos win

2. Lowest price

- Lift – the effect of an external event, such as advertising, on sales when a promotion is in effect. Used in forecasting. A multiplier applied to the demand.
- LiftType – used to define the lift. The possible values for lift are:
  - Base (0) – for base media lifts.
  - Relative (1) – for relative media lifts.
  - POS (2) – for percent-off events that are independent of markdown status.
  - Additional (3) – for percent-off events. Applicable only to items that have had one or more markdowns.
  - No\_Markdown (4) – for percent-off events. Applicable only to items that have had no markdowns.
  - First\_Markdown (5) – for percent-off events. Applicable only to items that have had one markdown.
  - Multiple\_Markdown (6) – for percent off events. Applicable only to items that have had two or more markdowns.

Base and relative are used for combining media effects. The lift on a given day is computed by multiplying max (Base lifts) and max (Relative lifts). POS, Additional, No\_Markdown, First\_Markdown, and Multiple\_Markdown are all used for point-of-sale promotions. In these promotions, the sales price is calculated by taking a percent off the ticket price. The percent off is specified in the service field as a relative price. So, 35 % off means a relative price of 0.65. The promotional price is triggered only if the specified Lift Type conditions apply.

A POS means that the discount is taken in addition to lowest permanent (list or markdown, but not promotion or clearance) price. Additional means that the discount is taken in addition to the lowest permanent (markdown, but not promotion or clearance) price. The Interpretation for either POS, Additional, No\_Markdown, First\_Markdown, and Multiple\_Markdown promotions should be set to PROMO\_UNRESTRICTED.

- Scenario\_ID - 0 for optimization run; all other values identify a specific What If scenario.

**IR\_PRICE\_LADDER and IR\_PRICE\_LADDER\_C**

The IR\_PRICE\_LADDER inference rule sets the available prices that the model can use for optimization. The prices in the price ladder are defined relative to the original full retail price. This can be customized to trim the available prices based on specific business constraints.

This inference rule defines the base candidate prices that are used on any available markdown day. The Calculation Engine uses this to determine an optimal sequence of markdowns. So assumptions based on the current date or the current price should be carefully evaluated.

The prices supplied by IR\_PRICE\_LADDER\_C are assumed to be consistent with the pricing group pricing rule. Otherwise, they will not be considered as markdown candidates. For example, in a “price together” pricing group, only the dollar amounts (calculated via relative price \* full price) common to each item’s price ladder will be considered. If there are no dollar values in common, no markdown is possible.

A Scenario\_ID column is included for use with What If.

This inference rule has the following columns:

- Item\_ID – identifies the item.
- Price – the price relative to the full price for the item.
- Interpretation – Permanent markdown = 1.
- Scenario\_ID – 0 for optimization run; all other values identify a specific What If scenario.

**IR\_PRIOR\_DISTRIBUTION**

The IR\_PRIOR\_DISTRIBUTION inference rule lists Analytical Services values.

**IR\_PROCESS\_NULL\_OUTDT**

This inference rule is used for backward compatibility with versions of the service prior to 4.0.

**IR\_PROJ\_MKDNS**

The IR\_PROJ\_MKDNS inference rule. For What If, scenario\_ID is specified in internal queries.

**IR\_ROLLUPS**

The IR\_ROLLUPS inference rule references the ITEM\_DATA table directly and calculates rollups based on the data in this table. It lists the following metrics:

- Cumulative average price
- Cumulative sell-through percent
- Cumulative percent off
- Average price for the current week
- Cumulative gross profit percent
- Sell-through percent for the current week
- Sell-through percent week-minus-1
- Sell-through percent week-minus-2
- Sell-through percent week-minus-3

- EOL gross margin dollars
- EOL gross margin percent
- Weeks of supply

#### **IR\_SEASON\_METRICS**

The IR\_SEASON\_METRICS inference rule lists the following metrics:

- MTD average price
- Unit sales season-minus-1
- STD gross margin percent

#### **IR\_SEASONALITY\_ATTRIBUTE**

The IR\_SEASONALITY\_ATTRIBUTE inference rule defines the item attribute value that is used to look up seasonalities.

This inference rule has the following columns:

- Item\_ID – identifies the item.
- Item\_Attribute – the Analytical Services value assigned to the item.

#### **IR\_STATE\_TRANS\_CONFIG\_OVERRIDE**

The IR\_STATE\_TRANS\_CONFIG\_OVERRIDE inference rule is used for risk rating and is provided by Analytical Services.

#### **IR\_STATE\_TRANS\_PREV\_RUN**

The IR\_STATE\_TRANS\_PREV\_RUN inference rule is used for risk rating and is provided by Analytical Services.

#### **IR\_USER\_DATES and IR\_USER\_DATES\_C**

The IR\_USER\_DATES inference rule defines six date values per item, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast information.

This inference rule has the following columns:

- Item\_ID – identifies the item
- User date columns as appropriate

#### **IR\_USER\_FLOATS and IR\_USER\_FLOATS\_C**

The IR\_USER\_FLOATS inference rule defines twelve numeric values per item, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast information.

This inference rule has the following columns:

- Item\_ID – identifies the item
- User float columns as appropriate

#### **IR\_USER\_TEXTS and IR\_USER\_TEXTS\_C**

The IR\_USER\_TEXTS inference rule defines four text values per item, based on retailer requirements, for the ITEM\_DATA table during the optimization run. This inference rule does not have access to forecast information.

This inference rule has the following columns:

- Item\_ID – identifies the item
- User text columns as appropriate

#### **IR\_WAREHOUSE**

The IR\_WAREHOUSE inference rule provides Warehouse\_On\_Hand and Warehouse\_On\_Order to the ITEM\_DATA table. If a retailer does not want to include warehouse on order units in the forecast, the Warehouse\_On\_Order units should be set to zero.

#### **WIF\_FORECAST\_DATA**

The WIF\_FORECAST\_DATA inference rule is dependent on other, configurable inference rules and is included in ir.sql because it cannot be created unless several other inference rules have already been created. It must not be configured or modified.

#### **IR\_WORKSHEET\_IDS**

The IR\_WORKSHEET\_IDS inference rule populates all values up to the level at which worksheets are defined and specifies how the worksheets are mapped to the back end. It generates submittal\_worksheet\_IDS for the service. Worksheets must be defined for all  $N$  levels in the combined merchandise hierarchy/location hierarchy, where  $N$  is a value between 1 and 4.



---

---

## What If Engine Service Call

The What-If functionality is used to experiment with different optimization strategies. This chapter contains the following sections:

- [Introduction](#)
- [Configuring the RMI Server](#)
- [What If and Pricing Groups](#)
- [What If and the Database](#)
- [What If and Inference Rules](#)

### Introduction

The What If Engine Service Call (ESC) functionality allows users to enter a group of items, make experimental changes to certain settings, and then perform a re-optimization. This can be used to model the effects of the setting changes on the service markdown recommendations and forecasts for the selected items.

The What If ESC functionality is implemented within the service through an API call to the Clearance Optimization Engine (COE) via the RMI server.

Setting changes are implemented just below the inference rule level so that the inference rules can pick up the changed values. Relevant inference rules have been modified to enable What If to function with existing inference rules.

This chapter provides details about the configuration of the What If.

### Configuring the RMI Server

The RMI server, which is part of the Calculation Engine and which facilitates remote Java method calls, provides COE with access to the optimization engine. Each instance of COE is associated with a single RMI server.

### Starting the RMI Server and Registry

The `enginectl.sh` script is used to start and stop the RMI server from the command line. It calls `runInteractiveCE.sh` with the `-p` flag set. So, in production, protected mode is the default. This option can only be turned off by modifying the `CONFIGURATION` section of `enginectl.sh`.

To start, stop, kill, restart, get the status for, or get help about the interactive engine (RMI server), use the following commands:

```
enginectl.sh <ConfigRoot> start
```

This starts the engine and the failover process.

```
enginectl.sh <ConfigRoot> stop
```

This stops the engine and the failover process and provides an error message on failure.

```
enginectl.sh <ConfigRoot> kill
```

This stops the engine and the failover process and provides an error message on failure.

```
enginectl.sh <ConfigRoot> restart
```

This stops and then restarts both the engine and the failover process. It provides an error message if restart fails. It does not provide an error message if stop fails and restart succeeds.

```
enginectl.sh <ConfigRoot> status
```

This message indicates whether or not the engine is running and if the protected mode flag is set.

```
enginectl.sh <ConfigRoot> help
```

This prints a usage message.

Other versions of the help command include `enginectl.sh help` and `enginectl.sh`.

These commands are located in `modules/tools/bin`.

## Port and Host Configuration

The port used by the RMI server must be configured as `delphi.rmi.port` in:

- `config/Engine/delphi.properties`
- `config/suite/suite.properties`

The value assigned to `delphi.rmi.port` must be the same in both files.

In addition, a value must be assigned to `delphi.rmi.host` in `config/suite/suite.properties`.

For example:

```
delphi.rmi.host=oracle.com
```

```
delphi.rmi.port=7062
```

## What If and Pricing Groups

The COE model run can be configured to optimize items as both a member of a pricing group and as an individual item. What If recalculations can be configured to optimize an item either as a member of a pricing group or as a an individual item.

You configure the What If setting in `config/Price/config.properties`.

The default setting specifies that a What if recalculation occurs at the item level:

```
pricefe.systemwide.itemDominant=true
```

To specify that a What If recalculation occurs at the pricing group level:

```
pricefe.systemwide.itemDominant=false
```

COE has three configuration points for item vs. pricing group optimization and these should be configured consistently:

- `P4P_FORECAST_DATA` table, which is populated via `load_Statements.sql`

- IR\_P4P\_MARKDOWN\_ACTIVITIES, which is used by What If to access model run recommendations
- pricefe.systemwide.ItemDominant (default = true) in config.properties

## What If Size Limitations

What If recalculations perform best within certain size limitations. You can configure What If to define the number of items that are permitted in a given recalculation.

The following parameter is configured in config/Price/config.properties:

- p4pgui.what-if.max.size - should not be set to greater than 1,000. The recalculation will not be initiated if the number of items exceeds this value. Use this parameter to manage how users can configure What If so that performance is not degraded. If there are two scenarios and the sum of items in these two scenarios exceeds the total maximum, the What If returns the correct error message. The sum of all the items in all the scenarios sent in a What If call must be equal to or less than the What If max size.

## Configuring p4pgui config.properties

The following settings must be configured to determine pricing group membership in order to determine which items to re-optimize. For more information on What If and pricing groups, see [“What If and Pricing Groups” on page 5-2](#).

**Table 5–1 What If Settings in config.properties**

Setting	Definition	Value
pricefe.systemwide.itemDominant=true	Flag for setting pricing group dominance or item dominance at the system level. When the Item recommendation = the Pricing Group recommendation, this flag is used to determine whether to set the Markdown flag to Pricing Group Rec or Item Rec.	True (default) - items re-optimized as items False - items re-optimized as pricing group members
p4pgui.what-if.max.size	Defines the hard limit on the number of items	Default = 1000
p4pgui.what-if.pricing-group-item.weight	Defines the weight for each additional item in a pricing group being re-optimized	Usually a decimal value less than 1.0. Default value = 0.7.

## What If and the Database

The output from a What If recalculation is stored in the database, as follows:

- the recommended markdowns (MARKDOWN\_ACTIVITIES), WIF\_ITEM\_MARKDOWN\_TBL
- the override values - WIF\_SCENARIO\_TBL

The What If database tables are cleaned up at the end of each request.

### Database Tables

Here are some of the tables associated with What If:

WIF\_SCENARIO\_TBL - contains the scenario override values for a given scenario\_ID.

**Table 5–2 WIF\_SCENARIO\_TBL**

Column Name	Description	Data Type	Maximum Length	Nullable (Y/N)
Scenario_ID	Identification number for a scenario, which is generated by the optimization engine.	Integer	32	N
New_Blackout_End	No new markdown recommendations can be made before this date.	Date in format YYYY-MM-DD	10	Y
New_Inventory	The sum of inventory on hand, inventory on order, and, optionally, inventory in the warehouse. This value overrides total inventory quantity at end of history.	Integer	32	Y
New_Out_Dt	This value overrides BRPM's OUT_DT.	Date in format YYYY-MM-DD	10	Y
New_Inventory_Target	This value overrides BRPM's INVENTORY_TARGET.	String	100	Y
New_Salvage_Above_Target	This value overrides BRPM's SALVAGE_ABOVE_TARGET.	String	100	Y

Note that New Inventory Target can be configured as Sell Thru % or Ending Inventory Units.

WIF\_ITEM\_MARKDOWN\_TBL - contains the markdown recommendation for a given scenario\_ID and item\_ID.

**Table 5–3 WIF\_ITEM\_MARKDOWN\_TBL**

Column Name	Description	Data Type	Maximum Length	Nullable (Y/N)
Scenario_ID	Identification number for a scenario, which is generated by the optimization engine.	Integer	32	N
Item_ID	Identifies the item.	Integer	32	N
Calendar_dt	The date for the markdown.	Date in format YYYY-MM-DD	10	N
Interpretation	PERM = 1 TEMP = 2 POS = 3	Integer	1	N
Relative_Price	Markdown relative value.	Decimal	20,18	Y

WIF\_RESULTS\_TBL - provides a mapping between Scenario\_ID/Item\_ID and the Forecast\_ID.

**Table 5–4 WIF\_RESULTS\_TBL**

Column Name	Description	Data Type	Maximum Length	Nullable (Y/N)
Scenario_ID	Identification number for a scenario, which is generated by the optimization engine.	Integer	32	N
Item_ID	Identifies the item.	Integer	32	N
Forecast_ID	Identifies the forecast.	Integer	32	N

## What If and Inference Rules

What If is used to perform a recalculation of the optimization on a select group of items. Users can override certain settings to simulate changes using What If. Each re-optimization session is assigned a scenario\_ID by the optimization engine. The scenario\_ID is used to identify the specific What if calculation. The scenario\_ID is also used in all inference rules that are called during a What If calculation.

Scenario overrides (that is, the new values being used in the What If simulation) in What If are implemented just under the inference rule level so that the inference rules that are affected by What If can pick up the override values.

The following table details the relationship between the scenarios settings and specific inference rules:

**Table 5–5 Scenario Settings in relationship to Inference Rules**

Scenario Setting	Inference Rules
Exit Date	IR_ITEM_DATES, IR_ITEM_DATES_C, other inference rules that reference IR_ITEM_DATES
Scenario Markdowns	IR_PENDING_MARKDOWNS
Inventory Level	IR_ACTIVITY_DATA
Inventory Target	IR_BUSINESS_POLICY (INVENTORYTARGET and TARGETSELLTHRU) (corresponds to BRPM values)
Salvage Value	IR_BUSINESS_POLICY (SALVAGEVALUEABOVETARGET)
End Blackout Date	IR_MARKDOWN_CALENDAR, IR_MARKDOWN_CALENDAR_C

In addition, IR\_PENDING\_MARKDOWNS obtains markdowns from WIF\_ITEM\_MARKDOWN\_TBL, which contains the markdowns from the What If recalculation.

## How What If Affects Inference Rules

Inference rules are affected by What If in one of three ways:

- Inference rules that have a column for scenario\_ID and contain override logic so that they can pick up the override values from WIF\_SCENARIO\_TBL:
  - IR\_BUSINESS\_POLICY
  - IR\_ITEM\_DATES
  - IR\_ITEM\_DATES\_C
  - IR\_MARKDOWN\_CALENDAR
  - IR\_PENDING\_MARKDOWNS
  - IR\_ACTIVITY\_DATA
- Inference rules that have a column for scenario\_ID but no override logic. These inference rules have dependencies on the inference rules that do contain override logic:
  - IR\_BLOCKED\_MARKDOWN

- IR\_BLOCKED\_MARKDOWN\_C
- IR\_MARKDOWN\_CALENDAR\_EX
- IR\_MISSING\_WEEKS
- IR\_PAST\_TICKET\_PRICES
- IR\_PLANNED\_PROMOS
- IR\_PRICE\_LADDER
- IR\_PRICE\_LADDER\_C
- Inference rules that specify scenario\_ID = 0 in internal queries so that they only retrieve optimization run data and not What If override data from other inference rules they have dependencies with.
  - IR\_DISPLAY\_PROMOS
  - IR\_FORECAST\_METRICS\_POSTRUN
  - IR\_ITEM\_INFO
  - IR\_ITEM\_INFO\_C
  - IR\_ITEM\_PRICES
  - IR\_ITEM\_PRICES\_C
  - IR\_PROJ\_MARKDOWNS

### **Inference Rule Dependencies for What If**

The scenario overrides from What if affect a number of inference rules directly and many others indirectly. Other linkages are possible, as described in the text. However, when you are configuring the inference rules, you should try to avoid breaking any of the linkages shown here, or incorrect What If behavior may result.

The following table lists the inference rule dependencies for What If. Inference rules are identified as primary in this table simply in terms of the dependency relationships being specified.

**Table 5–6 Inference Rule Dependencies**

<b>Primary Inference Rule</b>	<b>Inference Rule(s) That Depend(s) on the Primary Inference Rule</b>
IR_ITEM_DATES (_C)	IR_ACTIVITY_DATA
	IR_PENDING_MARKDOWNS
	IR_MISSING_WEEKS
	IR_PAST_TICKET_PRICES
	IR_MARKDOWN_CALENDAR (_EX)
	IR_BLOCKED_MARKDOWN(_C)
	IR_FORECAST_METRICS_POSTRUN
	IR_PROJ_MKDNS
	IR_HISTORIC_METRICS
	IR_DISPLAY_PROMOS
	IR_ITEM_INFO(_C)
	IR_PLANNED_PROMOS
IR_ITEM_PRICES(_C)	IR_PRICE_LADDER(_C)
	IR_HISTORIC_METRICS
	IR_DISPLAY_PROMOS
	IR_ITEM_INFO(_C)
IR_BUSINESS_POLICY	IR_PRICE_LADDER(_C)
	IR_MARKDOWN_CALENDAR
IR_WAREHOUSE	P4P_WHAT_IF_ITEM_BASE
	IR_ACTIVITY_DATA
	IR_BUSINESS_POLICY
	IR_FE_WAREHOUSE
IR_MISSING_WEEKS	IR_HISTORIC_METRICS
	IR_ACTIVITY_DATA
IR_ITEM_IDS(_C)	IR_PAST_TICKET_PRICES
	IR_PRICE_LADDER(_C)
IR_MARKDOWN_CALENDAR_EX	IR_MODEL_VALUES
	IR_MARKDOWN_CALENDAR
IR_PENDING_MARKDOWNS	IR_BLOCKED_MARKDOWN(_C)
	IR_ITEM_PRICES(_C)
IR_PLANNED_PROMOS	WIF_FORECAST_DATA
IR_METRICS	IR_SEASON_METRICS



---

---

# Internationalization

COE is translated into multiple languages. The details of internationalization are discussed in this chapter.

This chapter contains the following sections:

- [Introduction](#)
- [Translation](#)
- [Files](#)
- [Configuration Settings](#)
- [Formatting for Internationalization](#)

## Introduction

Internationalization is the process of creating software that can be easily translated. Changes to the code are not specific to any particular market. COE has been internationalized to support multiple languages.

This chapter describes configuration settings and features of the software that ensure that the base application can handle 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:

- 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
- Demo data

- Training materials

The user interface for COE has been translated into:

- Chinese (Traditional)
- Chinese (Simplified)
- Croatian
- Dutch
- French
- German
- Greek
- Hungarian
- Italian
- Japanese
- Korean
- Polish
- Portuguese (Brazilian)
- Russian
- Spanish (Spain)
- Swedish
- Turkish

COE depends on both the browser settings and the regional settings to determine which language is being supported for a specific implementation.

## Files

The following COE files are translated for each language that is supported by an installation. These files are the resource files used by the application for culturally dependent data and text strings that are displayed to end users. A properties file may exist in more than one subdirectory; any changes must be made consistently in all versions of each properties file. These files do not have to be registered with the application server.

### Translated Files

The translated files each exist in two different formats.

- The format used by the application (ending in .properties)
- The format that can be used for customization (ending in .native)

Note that the `_xx` in the filename designates the locale of the file. The locale can be the language alone (e.g., `_en`, `_fr`), or a language\_country combination (e.g., `_en_GB`, `_fr_FR`). Refer to the "Supported Locales" section of the Java Internationalization documentation appropriate for the version of Java that you are using.

```
./config/Price/resources/formats_xx.properties  
./config/Price/resources/formats_xx.properties.native  
.  
.
```

```

./config/Price/resources/gridResources_xx.properties
./config/Price/resources/gridResources_xx.properties.native
.
.
./config/Price/resources/p4pguiResources_xx.properties
./config/Price/resources/p4pguiResources_xx.properties.native
.
.
./config/Price/resources/UserMessageResources_xx.properties
./config/Price/resources/UserMessageResources_xx.properties.native
.
.
./config/suite/resources/businessrulemgrResources_xx.properties
./config/suite/resources/businessrulemgrResources_xx.properties.native
.
.
./config/suite/resources/CommonMessages_xx.properties
./config/suite/resources/CommonMessages_xx.properties.native
.
.
./config/suite/resources/EngineResources_xx.properties
./config/suite/resources/EngineResources_xx.properties.native
.
.
./config/usermanagement/resources/gridResources_xx.properties
./config/usermanagement/resources/gridResources_xx.properties.native
.
.
./config/usermanagement/resources/UsermanagementResources_xx.properties
./config/usermanagement/resources/UsermanagementResources_xx.properties.native
.
.
./config/usermanagement/UserAccount_xx.properties
./config/usermanagement/UserAccount_xx.properties.native

```

## Directory Structure

Beneath the configuration root directory is the COE application root directory. This directory contains subdirectories for default resources and default grid configurations. The application root directory also contains the retailer-specific configuration directory. The Client directory contains the properties files that have been localized/configured for a retailer implementation.

Files that are localized are named according to the following convention, using the base name of the file and adding a language specification, as shown in the following example. Note that, since two dialects of Chinese are supported, the part of the string that identifies the language contains two parts. This pattern will apply to any language in which more than one dialect is supported.

Chinese (Taiwan)            gridResources\_zh\_TW.properties

The localized files contain the translated user interface strings, localized date and number formats, but no locale-insensitive information such as database or installation configuration properties.

## Configuration Settings

In order for COE to function correctly when localized, the end user's Browser settings and the Regional and Language Options settings of the operating system must match.

If they do not match, the UI may display in an inconsistent manner. The Browser settings can be found in the Internet Explorer under Tools > Internet Options > Languages. The Regional and Language Options can be found in the Control Panel.

The following table lists these settings:

**Table 6–1 Language Settings**

<b>Browser Settings</b>	<b>Regional and Language Option</b>
Chinese (China) [zh-CN]	Chinese (PRC)
Chinese (Taiwan) [zh-TW]	Chinese (Taiwan)
Croatian [hr-HR]	Croatian
Dutch [nl-NL]	Dutch
English (United States) [en-us]	English (United States)
French (France) [fr-FR]	French (France)
German (Germany) [de]	German (Germany)
Greek [el-GR]	Greek
Hungarian hu-HU	Hungarian
Italian [it-IT]	Italian
Japanese [ja-JP]	Japanese
Korean [ko-KR]	Korean
Polish [pl-PL]	Polish
Portuguese (Brazil) [pt-BR]	Portuguese (Brazil)
Russian [ru-RU]	Russian
Spanish (International Sort) [es-ES]	Spanish (Spain)
Swedish [sv-SE]	Swedish
Turkish [tr-TR]	Turkish

## Formatting for Internationalization

The formatting of dates, time, and numbers is locale-specific and determined by the Browser settings and the Regional settings.

### Currency

---



---

**Note:** A single COE installation can be configured to support more than one underlying currency. Typically, items would be segregated into worksheets by currency regions. However, COE only supports a single currency symbol used for formatting tabular financial data within a single implementation. A separate currency metric column or other labels can be configured to convey which currency is appropriate for a given table.

---



---

To set the currency symbol for the application, edit CommonMessages.properties.

Specifically, you must edit `CommonMessages_xx.properties.native`, using the procedure described below, to update your edits into `CommonMessages_xx.properties`.

For example, to specify the Euro in French, edit `CommonMessages_fr.properties.native` as follows:

```
cc.currencySymbol.localOverride=€
```

While you can edit the `CommonMessages_fr.properties` directly and set the value to the symbol for the Euro, if you need to update other strings, (which involves edit the native file and run the conversion at a later time), you will overwrite the Euro setting and lose it unless you have updated the change to the native file.

## Format Patterns

Number format patterns are used to specify the arrangement of digits, group and decimal separators, percent symbols, and currency symbols in numeric formats. Date format patterns specify the arrangement of seconds, minutes, hour, day, month, year, and day of week and date separators in date formats. In COE, the format patterns are always specified using US English separator conventions. The currency symbols themselves and the numeric separator character are not specified in the format patterns.

Default format patterns are specified in `CommonMessages.properties`. These can be edited to match retailer and or locale requirements. Format patterns can be found in almost any of the properties files, but they are most common in `gridResouces.properties`.

### Number Format Patterns

Number format patterns are expressed with US English separators ("comma" for the thousands separator and always "period" for the decimal separator), regardless of the locale. For example, `#0.00%`, `0 %`, and `#.0000 %` are all valid formats. A specific configuration may require that in English the user sees two decimal places and in European Union the user sees one decimal place. The pattern string for English is `"#0.00%"` and the pattern string for French is `"% #0.0"`. The user sees `59.29 %` in English and `% 59,3` in French.

The pattern string `"#0,00"` is an invalid format because it uses the comma as the decimal separator. It should be `#0.00`.

### Currency Format Patterns

Currency format patterns behave the same as number format patterns except that they contain the universal currency symbol to show the position of the currency symbol "¤" in the format. This symbol is represented as `\u00A4`.

For example `###0.00 \u00A4 ; (###0.00 \u00A4)` is a reasonable format for an EU country using the Euro. If the currency symbol is set to be the Euro as describe above, the following value will be formatted as follows for the German locale:

```
-123456.99 -> (123 456.99 €)
.99 -> 0.99 €
```

### Date Format Patterns

Date Format Patterns must always be expressed in US English symbols.

**Table 6–2 Date Format Patterns**

Letter	Date/Time Component	Presentation	Example
G	Era designator	Text	AD
y	Year	Year	1996; 96
M	Month in year	Month	July; Jul; 07
w	Week in year	Number	27
W	Week in month	Number	2
D	Day in year	Number	189
d	Day in month	Number	10
F	Day of week in month	Number	2
E	Day in week	Text	Tuesday; Tue
a	AM/PM marker	Number	PM
H	Hour in day (0 - 23)	Number	024
k	Hour in day (1 - 24)	Number	0
K	Hour in AM/PM (0 - 11)	Number	12
h	Hour in AM/PM (1 - 12)	Number	30
m	Minute in hour	Number	55
s	Second in minute	Number	978
S	Millisecond	Number	
z	Time zone	General time zone	Pacific Standard time; PST; GMT-08:00
Z	Time zone	RFC 822 time zone	-0800

For example, in Portugal, the day precedes the month, and dashes are the typical separator. Note that unlike the Number Format patterns, the separator characters are defined in the pattern. So in the Portuguese locale, a short date might be specified as follows:

dd-MM-yyyy

## Number Separators

By default, COE displays thousands and decimal separators as determined by Java’s internationalization framework. The default behavior of the application should match the locale of the user’s browser.

For example, if the format pattern `#,###0.00` is used for the floating point number 1234.56, it displays as follows, depending on the browser setting:

**Table 6–3 Number Display**

Browser Setting	Number Displayed
EN	1,234.56
NL	1.234,56
FR	1 234,56

To override the default, edit `CommonMessages.properties`. For example, to define specific separators:

```
cc.groupSeparatorSymbol.localeOverride=.
cc.decimalSeparatorSymbol.localeOverride=,
```

This setting produces the following results:

**Table 6–4** *Number Display*

Browser Setting	Number Displayed
EN	1.234,56
NL	1.234,56
FR	1.234,56

## **formats.properties**

The `formats.properties` file contains the number and date formats used for insertion into some user-facing error messages. A file exists for each locale supported by COE. The separator symbols in the format strings must always be "comma" for the thousands separator and must always be "period" for the decimal separator, regardless of the locale.

For example, `#0.00%`, `0 %`, and `#.0000 %` are all valid formats. A specific configuration may require that in English the user sees two decimal places and in EU the user sees one decimal place. The pattern string for English is `"#0.00%"` and the pattern string for French is `"% #0.0"`. The end user sees `59.29 %` in English and `% 59,3` in French.

The pattern string `"#0,00"` is an invalid format because it uses the comma as the decimal separator.



---

# Pricing Group Management

This chapter provides details about pricing group configuration.

It contains the following sections:

- [Introduction](#)
- [Load Procedures](#)
- [Inference Rule Configuration](#)

## Introduction

Pricing groups (previously called "collections") in Clearance Optimization Engine (COE) are traditionally managed at the optimization level (non-chain pricing groups). COE also permits pricing groups to be managed at the chain level but optimized at a lower level.

Chain level pricing groups can be useful, for example, when adding merchandise to a pricing group in all locations. Instead of adding the merchandise to each location separately, a user can add the merchandise only once, at the chain level, and the merchandise will be added by the service to each location.

Two inference rules provide configuration points for pricing groups. The IR\_ITEM\_COLLECTION inference rule is used to provide custom configuration for defining what is included or excluded from the s load. The IR\_COLLECTION\_OPTION inference rule contains a flag that is used to indicate whether pricing groups are managed at the chain level or at the optimization level. (Note that IR\_COLLECTION\_INFO continues to be used for optimization without regard to pricing group management.)

Three load procedures provide the functionality for loading pricing groups into COE: LoadCollectionsAuto, LoadCollectionsSendback, and LoadCollectionsFE.

Pricing group information is stored in ITEM\_DATA and in P4P\_COLLECTIONS (both populated by LoadCollectionsFE). If pricing groups are managed at the chain level, the Collection\_ID column in ITEM\_DATA (which is used by the front end) is populated with a parent record, and the Internal\_Collection\_ID column (which is used by the model) is populated with children records, and P4P\_COLLECTIONS is populated with chain-pricing group information.

If pricing groups are managed at the optimization level, both columns are populated with the optimization-level record, and P4P\_COLLECTIONS is populated with item-pricing group information.

## Load Procedures

There are three load procedures for pricing groups: LoadCollectionsAuto, LoadCollectionsSendback (both part of the Standard Load - run from pl\_load\_client.sh), and LoadCollectionsFE (part of FELOAD in load\_statements.sql - run from plfrontendload.sh). None of these loads require ASH staging files. For more information on the standard load and the optimization run, see the *Oracle Retail Clearance Optimization Engine Operations Guide*.

### LoadCollectionsAuto

The ir\_item\_collection view determines how to group items into pricing groups, and the LoadCollectionsAuto procedure creates new pricing groups and new pricing group maps based on the view. All items with the same COLLECTION\_CLIENT\_ID are assigned to the same pricing group. If any item has already been assigned to a pricing group, or has already been auto-collected, the load procedure excludes it (via the ITEM\_ASSIGNED\_COLLIS\_TBL table).

The procedure populates COLLECTIONS\_TBL with distinct pricing groups and populates COLLECTION\_MAPS\_TBL with the mappings for pricing groups to items. If an item is not already in COLLECTION\_MAPS\_TBL, it will be auto-collected as part of the load procedure.

The LoadCollectionsAuto procedure derives the rules for grouping items into pricing groups from the IR\_ITEM\_COLLECTION inference rule. See [“Inference Rule Configuration” on page 7-2](#) for details on configuring the inference rule.

A flag in IR\_ITEM\_COLLECTION\_OPTION determines whether the pricing groups are managed at the chain level or at the optimization level. When the flag is set to N (the default value), pricing groups are managed at the optimization level. When the flag is set to Y, pricing groups are managed at the chain level.

To disable auto-collection, you can redefine IR\_ITEM\_COLLECTION so that it does not return any records (for example, by adding 1=0 to the where clause in the view).

New items that become eligible or ineligible are automatically added or removed from a chain level pricing group as long as they are part of the Items data feed.

## Inference Rule Configuration

The IR\_ITEM\_COLLECTION inference rule defines how items are grouped into pricing groups. The IR\_ITEM\_COLLECTION\_OPTION is set either to N, which indicates that the pricing groups are managed at the level of optimization, or to Y, to indicate pricing group management at the Chain level.

### Example Configurations

Here are three sample configurations.

#### IR\_ITEM\_COLLECTION

Here is an example configuration of IR\_ITEM\_COLLECTION for pricing groups. The single point of configuration is the collection\_client\_id. This column defines parent pricing groups in the non-default (Y) implementation. It defines child pricing groups in the default (N) implementation by including Location\_ID, as shown in the following example.

```
CREATE VIEW ir_item_collection
(ITEM_ID, MERCHANDISE_ID, LOCATION_ID
```

```

    COLLECTION_CLIENT_ID, COLLECTION_DESC)
AS
SELECT item_id,
       i.merchandise_id,
       i.location_id,
       case when iro.chain_flag='Y' then mh1.client_load_id||'/'||i.season_code
       else mh1.client_load_id||'/'||i.season_code||'/'||i.location_id end as
       collection_client_id,
       mh1.merchandise_desc || ' ' || i.season_code as collection_desc
FROM items_tbl i, merchandise_hierarchy_tbl mh, merchandise_hierarchy_tbl mh1, ir_
item_collection_option iro
WHERE mh.merchandise_id = i.merchandise_id and mh1.merchandise_id =
      mh.parent_merchandise_id

```

### Chain-Level Pricing Groups

An example of Chain Pricing Group flag (IR\_ITEM\_COLLECTION\_OPTION):

```

CREATE VIEW ir_item_collection_option AS
      SELECT 'Y' AS chain_flag from DUAL-- identifier of chain collection
management implementation

```

## Redefining Pricing Groups

If you want to change the way items are grouped into pricing groups, you must do the following:

1. Update IR\_ITEM\_COLLECTION
2. Truncate the following tables:
  - COLLECTION\_MAPS\_TBL
  - COLLECTIONS\_TBL
  - ITEMS\_ASSIGNED\_COLL\_TBL
3. Re-run the LoadCollectionsAuto procedure. This occurs as part of the weekly batch process, so the new grouping will not be available until the next optimization run.



---

# Flexible Store Clustering

Flexible Store Clustering is used to customize store grouping and is implemented in COE via the Standard Interface and the Standard Load.

The chapter contains the following:

- [Introduction](#)
- [Technical Details](#)

## Introduction

Flexible Store Clustering is an optional feature of Clearance Optimization Engine (COE) that permits retailers to group stores differently for different sets of merchandise. Grouping the stores in this way can facilitate more accurate optimizations and forecasts than can occur at the chain level, because the selling patterns for the set of merchandise in the stores of a given cluster will be similar.

Analytical Services is responsible for the design of a retailer's flexible store clustering configuration.

Flexible Store Clustering is implemented in COE via the Standard Interface and the Standard Load.

## Technical Details

The following are technical details that should be taken into consideration when implementing Flexible Store Clustering:

A cluster is an arbitrary grouping of physical store locations. A cluster set is a group of clusters that is assigned to an entry in the merchandise hierarchy. A cluster set contains all stores only once.

The ideal number of groupings or clusters may vary by merchandise and retailer from approximately 5 to 25 for each set of merchandise.

Flexible Store Clustering is enabled and disabled by an implementation-wide flag that is stored in the database. The value is loaded via ASH\_CP\_TBL (intersect\_name = CLUSTER - the new hierarchy TYPE). The intersect name of the flag is CLUSTER, with merchandise and location values set to values other than CHAIN and CHAIN. These values must match the entries in the client\_hierarchy\_levels\_tbl. for the merchandise hierarchy and original location hierarchy levels.

If the merchandise levels are:

- Chain

- Company
- Division
- Department
- Class
- SKU

and the location levels are:

- Chain
- Region
- Store

and the cluster levels are:

- Chain
- Cluster Set
- Cluster
- Store

then the entries in ASH\_CP\_TBL for the CLUSTER entry must come from these defined hierarchy levels. In this example, there is only one valid location (level 2 - Cluster Set) and five valid merchandise possibilities. In general, the cluster set mappings should be set at the Division level.

Flexible Store Clustering is associated with only one level of the merchandise hierarchy for an implementation.

When merchandise hierarchy and location hierarchy values are set at a valid level other than CHAIN, clustering is enabled. If flexible store clustering is enabled, all items are defined using flexible store clustering and all activity aggregations use the flexible store clustering aggregations.

When flexible store clustering is being used, clusters (not cluster sets) are the location optimization level.

If User Management and the Business Rule Property Manager are configured before Flexible Store Clustering is implemented, then the rules must be re-defined for any setting below the level defined for clustering.

Business rules and security can be defined at the chain, cluster, and cluster set level.

Historic data can be re-aggregated after clusters are defined by re-loading the historic data. If store clusters are reorganized, historical data must be re-loaded so that it can be re-aggregated into the new store clusters.

The values in the ASH\_CP\_TBL identify whether Flexible Store Clustering is being used or not. If it is being used, the location load procedure combines the location hierarchy information with the store clusters and cluster sets and populates the location hierarchy tables with the appropriate data values. The current location hierarchy information is stored in a separate table. For information on standard load validations for Flexible Store Clustering, see the *Oracle Retail Clearance Optimization Operations Guide*.

During the item creation process the items are defined as the cross product of a Merchandise Hierarchy entry and a store cluster.

Modification of clusters to handle new location entries must be done after the locations are entered into the service. If merchandise is added to the merchandise hierarchy at a

level that does not have a cluster set defined, then no cluster set will be assigned to the merchandise.

Intermediate levels between clusters and cluster sets are permitted in the Standard Load. For a CLUSTER implementation alone, this acyclic tree validation is turned OFF for the last level. However, the CLUSTER level should be the  $(n - 1)$ , where  $n$  is the deepest level of the hierarchy (STORE). Only the CLUSTERSET is mapped to a merchandise level and is the same for the cluster mapping interface from the retailer. The CLUSTER key (client\_load\_id) cannot be repeated between cluster sets.

Moving a store from one cluster to another does not translate to items re-allocation on the activities history reconciliation.

Flexible Store Clustering does not require any configuration of nor is there any impact on inference rules.

The Mhrename standard interface does not remove inactive cluster sets. So, items that are members of inactive cluster sets are filtered out during the population of the INTERNAL\_ITEM\_DATA\_TBL table in FELOAD in load\_statements.sql.



---



---

## The UI Configuration

This chapter contains the following sections:

- [Introduction](#)
- [Service Level Configuration Files](#)
- [Configuring the Screens](#)
- [Column Configuration Files](#)

### Introduction

This chapter provides details about configuring the COE Pricing Group Manager UI.

---



---

**Note:** The Grid Designer is a Web-based rich application that enables you to modify the following main components of the grid configuration in a graphical user interface:

- Column definitions
- Grid resources
- Grid configuration files
- Report configuration files

For more information on the Grid Designer, refer to the *Oracle Retail Clearance Optimization Engine Grid Designer User Guide*.

---



---

### Service Level Configuration Files

Service-level configuration files contain information specifying elements in more than one screen in the service.

**Table 9–1** *Service-Level Configuration Files*

File Name	Defines
config.properties	The main service properties file that contains a list of all XML files that must be loaded when the service starts up.
p4pgui-config.xml	Defines various elements not defined in other configuration files.  Note that the valid elements for this file are defined in the following table.

**Table 9–1 (Cont.) Service-Level Configuration Files**

File Name	Defines
UserMessagesResources.properties	A user message that is triggered by an event within the service.
formats.properties	Defines custom formats such as price, date, percent, number, location.
CommonMessages.properties	Error message strings, command names, and minor formatting information for numeric and date columns
p4pguiResources.properties	Text string for Main Menu.

The following table shows the valid elements and sub-elements (nested elements) for the p4pgui-config.xml file.

**Table 9–2 Valid Elements and Nested Elements for p4pgui-config.xml File**

Element	Element Description	Valid Attributes for Element
forecast-params	Miscellaneous attributes for the What If.	number-forecast-weeks
sendback (Nested elements: select-query, pre-sendback-update)	Defines database queries that report changes made to the service metrics.	sendback name
hierarchy	Specifies data sources for the hierarchy filter widgets.	html-form-name id key
merchandise-maint-params (Nested elements: outdate-constraints, excluded-days)	Specifies the following: <ul style="list-style-type: none"> <li>▪ Valid outdate range</li> <li>▪ Whether users modify Target Sell thru or Ending Inventory Target</li> </ul>	N/A
page	Specifies which grids are available in Pricing Group Manager.	N/A

## Configuring the Screens

The screens to be configured are as follows:

- Pricing Groups
- Edit Pricing Groups

### Configuring a Sample Screen

Here are the high-level steps for configuring a screen. These steps are described in detail in the following pages:

1. Identify the application screen metrics.
2. Identify the data source.
3. Create the columns.
4. Configure the grid features.

5. Test the display.

## Identifying the Application Screen Metrics

The first step in the configuration process is determining the grid metrics.

## Identifying the Data Source

To configure the grid, you must determine the data source for each column in the grid. The data source types are:

- Direct metric – direct reference to a database column
- Derived metrics:
  - Simple derivation – derived from an operation on a database metric
  - Complex derivation – derived from a user-defined column that is derived from a database column

To create columns for the screen, you must identify and specify data sources in both of the XML column files, `p4p-column-list.xml` and `p4p-custom-columns.xml`. You must use both column files because you need to configure two columns for each column that appears on the screen.

In the column files, you specify the data source within the `<column-def-properties>` element.

## Creating Columns

Columns are the basic building blocks of the application screens. Each column, as defined in the application metrics spreadsheet, represents one metric (type of data) for each row. When you configure the screens, you must define both displayed and hidden columns.

You do not define the standard, out-of-the-box application columns, which are already configured.

**Table 9–3 Configuration Files and Metrics**

File	Metrics
p4pgui-config.xml	Screen variable
	Column key reference
	Aggregation type
p4p-column-list.xml	Column key
	Data source definition
	Column display features
p4p-custom-columns.xml	Custom column to display variable
	Data source definition
	Alias for column label text
	Alias for context-sensitive column label description
	Column display features

**Table 9–3 (Cont.) Configuration Files and Metrics**

<b>File</b>	<b>Metrics</b>
p4p-maint-grid-groups.xml	Column key This section describes only the column-specific configurations for this file.
gridResources.properties	Display text for column label Display text for context-sensitive column label description.

For each configuration file, the following sections describe the following:

- Configurations to specify in this file
- Procedures for specifying each of these configurations

### **Configuring p4p-maint-grid-groups.xml**

To get the column properties, this file contains a reference to the column keys in the p4p-column.xml and p4p-custom-columns.xml file.

### **Configuring gridResources.properties**

This file contains configurations for:

- The label that appears at the top of the column
- The description that displays when the user hovers the mouse over the column label display

For example, the text label and description for HIERARCHY3 column can be defined as follows:

p4pgui.HIERARCHY3.column.label =

p4pgui.HIERARCHY3.column.description =

## **Configuring the Grid Features**

After the columns are configured, the next step is to configure the grid.

Each Pricing Group grid enables you to group columns of information. To prevent blank columns being grouped together, it is recommended that you enable grouping only on required fields.

The p4p-maint-grid-groups.xml file specifies

- The column group specification, which determines:
  - The columns to display on the grid
  - The display order of these columns

The column specifications in this file do not include column configurations such as data source, display properties, and function keys. These properties are specified in the <column-def-properties> element in the application XML column files.

- The row group specification, which determines:
  - The nesting of the rows
  - The different formats in parent and child rows
  - If applicable, specifications that override column group settings

- Identifying, functional, and display properties for the row and column groups

### Specifying Other Grid Attributes

The XML grid file is where you define properties for the grid as a whole. These properties include:

- Rows and columns frozen
- Default row level
- Filtering properties
- First-row header column
- Grid name

## Column Configuration Files

The column configuration files consist of two XML files and one properties file, as shown in the following table.

**Table 9–4** *Column Configuration Files*

File Type	File Name	Purpose
XML	p4p-column-list.xml	All columns available to all grids in a given retailer installation. This file is pre-configured and comes with the standard application.
	p4p-custom-columns.xml	Retailer-specific column definitions.
Properties	gridResources.properties	A file containing the column label text and description. An alias in the p4p-column-list.xml or p4p-custom-columns.xml file maps to the corresponding label text and description contained in this file.

The XML column configuration files, p4p-column-list.xml and p4p-custom-columns.xml, provide a set of fields (columns) that are available in the application across all grids. They define two types of data:

- Visible data that is displayed to the retailer in the user interface.
- Internal-use fields that are used by the system and cannot be seen by the retailer, for example, ID fields such as item ID and location ID.

These files are virtually identical in structure and syntax. The only syntax difference is in the file key name, shown in the following table. To see examples of the use of these columns in the XML column files, see the excerpts from the p4p-column-list.xml file and the p4p-custom-columns.xml file.

**Table 9–5** *File Key Names for XML Column Files*

File Name	File Key Name
p4p-column-list.xml	internalColumns
p4p-custom-columns.xml	customColumns

These two XML column files differ mainly in the source of their column definitions.

- The p4p-column-list.xml file contains standard column definitions for the installation that come out of the box with the application.

- The p4p-custom-columns.xml file is where you define custom columns for a particular retailer installation.

Typically, retailers request custom columns, which are then specified in the application metrics (business requirements) spreadsheet. These specifications define the column's display features, data source and type, and other attributes.

This file is optional. You should use it only if the retailer installation requires custom column definitions.

Note that the definitions in p4p-custom-columns.xml override the definitions in p4p-column-list.xml.

The columns defined in the XML column files work through the principle of inheritance. All columns defined in the p4p-column-list.xml and p4p-custom-columns.xml files are parent columns. Specifying inheritance is discussed in the section on the application grid files.

The syntax for the p4p-column-list.xml and p4p-custom-columns.xml files is the same except for the file key name.

**Table 9–6 Elements in XML Column Files**

Level	Element	Purpose	Acceptable Values
Top	<column-list>		N/A
Child	<column-def>	Default description of grid column.	N/A
N/A	<key>	The reference name for this column.	A unique name that describes the column. When creating this name, do not use spaces or HTML special characters.
N/A	<column-def-properties>	Properties that define the data and display details of a <column-def>.	N/A

Following is a table showing all XML elements found in both the p4p-column-list.xml file and the p4p-custom-columns.xml file. This table shows the level in the hierarchy for these elements and the acceptable values for those elements containing properties.

The <column-def-properties> element accepts the following values:

**Table 9–7 Acceptable Values for <column-def-properties> Element in the XML Column Files**

Attribute	Value	Description
<key>	Alphanumeric characters excluding spaces and HTML special characters	A unique key name for the column that must match the key name defined in the grid file for the column.
label	Must be a valid Java property key	Alias that points to the comparable label in the gridResources.properties file containing the label text that displays at the top of the column
description	Must be a valid Java property key	Alias that points to the comparable label description in the gridResources.properties file containing the context-sensitive label description for the top of the column

**Table 9–7 (Cont.) Acceptable Values for <column-def-properties> Element in the XML Column Files**

Attribute	Value	Description
type	currency	The type of data that can appear in this column, such as text, date, number, percent.
	date	
	double	This data type must match the data type of the comparable field in the database table from which it is drawn.
	integer	
	number	
	percent	
	string	
display-type	blank	How to render this column data on the screen.
	button	
	checkbox	
	combobox	
	date	
	dropdown	
	edit	
	float	
	hyperlink	
	integer	
	lock	
	owner-drawn	
	pic	
	picture	
	static-text	
	time	
read-only-type	blank	When a grid is in a read-only state, use this display type instead of the value of the display-type attribute.
	button	
	checkbox	
	combobox	
	date	
	dropdown	
	edit	
	float	
	hyperlink	
	integer	
	lock	
	owner-drawn	
	pic	
	picture	
	static-text	
	time	
DB-table-name	N/A	Defines the name of the database table that serves as the data source for this column.

**Table 9–7 (Cont.) Acceptable Values for <column-def-properties> Element in the XML Column Files**

Attribute	Value	Description
DB-column-name	N/A	Defines the name of the column within the database table that serves as the data source for this column. Note that the value of the db-column-name property must be UPPER CASE.
composable	true false	Indicates columns that the retailer can use to create custom columns.
filterable	true false	Indicates whether the retailer can choose to not display this column.
sortable	true false	Allows the grid's rows to be sorted by the column
orderable	true false	Allows the column to be reordered in the grid relative to the columns around it
hideable	true false	Indicates whether the user can hide the column.
expandable	true false	Indicates whether the user can expand the column.
visibility	never visible not visible visible	Specifies the visibility of the column. "never visible" means that the column is used by XML without being visible to the user through screens and drop-downs, while "not visible" means that the column is not visible.
editable	true false	Indicates whether the user can make edits to the column
filtertype	date dropdown text text area	Specifies the type of user-entry widget to use for each filterable column in the Customize Table user interface.
operatortype	equals list numeric	Specifies operator list types that are available for each filterable column in the Customize Table user interface.
columnstype	none expand-collapse row-select spacer	Specifies column types to be treated as a group. Typically, you do not modify these. The default value, none, is appropriate for any column that you customize.
function	N/A	Defines functions and arguments.  Note that the acceptable values for these functions are described in the following table.

The following table shows the functions that are available for the function attribute in the <column-def-properties> element.

**Table 9–8 Available Functions for <column-def-properties> Element in the XML Column Files**

Function	Description	Num	Date	String	Args/Type
P4P_SUM	Sum of child rows.	X			
P4P_MAX	Maximum of child rows.	X	X		
P4P_MIN	Minimum of child rows.	X	X		
P4P_AVG_CHILD	Weighted average of child rows.	X			
P4P_AVG	Weighted average of child rows. Note that this function requires a column key as an argument, using the XML tag <args>.	X			<column-def> or <column> key
P4P_PRICELADDER	Generates price ladders.	X			
P4P_LADDERPICKER	Generates a drop-down list from which the user selects ladders.	X			
P4P_SUBSTITUTE	Substitutes this column with the maximum value of the child rows of the column passed as an argument.	X			<column-def> or <column> key
P4P_BLANK	Specifies that no data is generated or displayed for this column.	X	X	X	
P4P_TEMPLATE	Substitutes the data for this column with the argument.	X	X	X	Resource Key
P4P_SAME_OR_NULL	Displays a value only if all children are the same.	X	X	X	
P4P_IF_POSITIVE	Displays the value passed as the argument only if the maximum of all the children is greater than 0.	X			<column-def> or <column> key
P4P_SAME_OR_TEMPLATE	Displays vlaue of identical children else display template value.	X	X	X	Resource Key

**Table 9–8 (Cont.) Available Functions for <column-def-properties> Element in the XML Column Files**

Function	Description	Num	Date	String	Args/Type
P4P_MAP_STATUS_AND_SAME_OR_TEMPLATE	Same as P4P_SAME_OR_TEMPLATE, except considers resourced values rather than key value.			X	Resource Key
P4P_TEMPLATE_IF_NOT_NULL	Show template value unless all children are null.	X	X	X	Resource Key

## Data Sources in XML Column Files

Note that the Pricing Group Manager grid uses the P4P\_MAINTAIN\_ITEMS view as a data source.

The metrics that display on the application screens are either directly quoted from metrics in the database tables or are derived from calculations on metrics that come directly or indirectly from the database tables.

- Direct Metric. This type of metric is a direct reference to a column that exists as a field in the corresponding database table. A direct metric is displayed on the grid exactly as it is defined in the database.
- Derived metrics. Derived metrics are based on calculations that are made on other metrics. The two types of derived metric are:
  - Simple derivation. This type of metric is derived from the result of a formula that performs calculations on a metric that comes directly from a database column.
  - Complex derivation. This type of metric is derived from a column that is defined in one of the XML column files, which in turn is derived from a column in the database. That is, an XML column may refer to another XML column that directly refers to the database.

## Sorting on User-Defined Metrics

The p4p-column-list.xml file can be modified to provide the user with the ability to sort on user-defined metrics. To do this:

1. In the XML file, go to USER\_DEFINED\_SUM, USER\_DEFINED\_DIFF, USER\_DEFINED\_RATIO, and USER\_DEFINED\_CUM\_SUM columns.
2. Change the sortable flag from sortable=false to sortable=true.

String columns in p4p-column-list.xml can be configured to make filtering case sensitive or case insensitive. To do this, use the following tags:

- iscasesensitive=false to make the column case insensitive
- iscasesensitive=true to make the column case sensitive

## Hierarchy Filtering

By default, a user can filter by Hierarchy 6. To use another level, change the INT\_UNIQUE\_ID derivation in p4p-column-list.xml to the appropriate number.

A user can filter items by any unique hierarchy combination. For example, configure INT\_UNIQUE\_ID to HIERARCHY( $n$ )-HIERARCHY( $n+1$ )-REGION in order to filter items by the HIERARCHY( $n$ )-HIERARCHY( $n+1$ )-REGION hierarchy combination.

The gridResources.properties file contains the label and description for the column.



---

## Configuration Properties Files

This chapter lists the COE configuration settings and contains the following sections:

- [Introduction](#)
- [config.properties Settings](#)
- [suite.properties Settings](#)
- [gdconfig.properties Settings](#)

### Introduction

The configuration properties files enable you to set up and configure various parameters in the COE application. This chapter lists the settings for `config.properties`, `suite.properties`, and `gdconfig.properties`.

Although you can update or set the values for the properties in these configuration files to configure the COE application, Oracle recommends that you make a copy of the file in the retailer sub-folder, and then update the configuration file. The properties defined in the configuration file (in the retailer sub-folder) override those found in the original configuration file.

Once you update the value of any parameter in the configuration files, you must restart the application server for the changes to take effect.

### `config.properties` Settings

The following settings are contained in `config.properties`. Each property is shown with its default value.

**Table 10–1 Settings for config.properties**

Property	Description
coe.authorization.enabled=ROLE	Use for the Web Service authentication. ROLE means that the authenticated user must be assigned to MDO_WHAT_IF_SERVICE_EXEC action for any scope in order to execute a web service request. Roles are always assigned to users with a scope. For ROLE authorization, the specifics of the scope are ignored. SCOPE means that the authenticated user must be assigned the MDO_WHAT_IF_SERVICE_EXEC action for a scope that encompasses all items in the request. If any requested item is not within a user's assigned scope, then the entire request will be rejected. For settings other than ROLE or SCOPE, no authorization checks are done.
p4pgui.what-if.max.size=1000	The maximum weighted size (hard limit) of a What-If selection. This value should not be set to greater than 1,000. The What-If recalculation will not be initiated if the number of items exceeds this value. Use this parameter to limit the size of a user's What If recalculation so that overall performance is acceptable.
p4pgui.what-if.pricing-group-item.weight=0.7	The weight to use for each item after the first in a pricing group in a What-If recalculation. Use this value as a variable when recalculating items in a pricing group. The value reflects the relative cost of optimizing individual items as compared to optimizing items in a pricing group.
pricefe.systemwide.itemDominant=true	Flag for setting pricing group dominance or item dominance at the system level. When the Item recommendation = the Pricing Group recommendation, this flag is used to determine whether to set the Markdown flag to Pricing Group Rec or Item Rec.
pricefe.seasoncodes.error.limit=100	The maximum weighted size (hard limit) of a Seasonality Curve selection. This value should not be set to greater than 100. The Seasonality Curve selection will not be initiated if the number of curves exceeds this value.
pricefe.seasoncodes.warn.limit=20	The practical maximum weighted size (soft limit) of a Seasonality Curve selection. The recommended value is 20. Setting this to a higher value can impact performance. The Seasonality Curve selection can still be initiated if the number of curves exceeds this value; however, the user will receive a warning.
pricefe.rdm.refresh.enabled=true	Determines whether or not RDM refreshes are enabled. (There are three types of RDM refreshes: On-Demand, Nightly, and Weekly.)
pricefe.itemListFilter.delimiters=newline, tab, space, colon, semicolon, comma	This setting specifies the delimiters that can be used to separate items in a list in the Item List Filter. Remove any values that are not appropriate. A pipe is also a valid delimiter if it is not part of the data.

**Table 10–1 (Cont.) Settings for config.properties**

Property	Description
pricefe.itemListFilter.identifier=INT_UNIQUE_ID	In conjunction with the INT_UNIQUE_ID derivation in p4p-column-list.xml file, this is used to define the hierarchy combination for filtering.
pricefe.showItemLevelFilter.WarningMsg=false	Use to obtain more details on which items are invalid or hidden in item level filtering. When this is set to true, Item Level Find by Filter is implemented, and the hidden item warning message and the invalid item (or hierarchy) warning message are displayed. By default, this is set to false and the hierarchy level Find by Filter is implemented.
pricefe.showRegionFilter=true	Determines whether or not the region filter in the quick filter is displayed.

## suite.properties Settings

The following settings are contained in suite.properties. Each property is shown with its default value.

**Table 10–2 Parameters in the suite.properties File**

Parameter	Description
common.dbdialect.dialect	Use this parameter to specify the database dialect used within the suite.
usermanagement.login.url	Use this parameter to specify the User Management login URL.
usermanagement.manageUsers.url	Use this parameter to specify the URL for the Manage Users screen in the User Management utility.
usermanagement.changePassword.url	Use this parameter to specify the URL for the Change Password screen in the User Management utility.
businessrulemgr.entry.url	Use this parameter to specify the Business Rule Property Manager URL.
storesets.entry.url	Use this parameter to specify the Store Set Management URL.
p4pgui.login.url	The COE application login URL.
common.hierarchy.cache.timeout.hours	Number of hours for the hierarchy caches to become stale.
common.hierarchy.fetch.merch.maxlevels	Maximum number of merchandise hierarchy levels to fetch at a time.
common.hierarchy.fetch.loc.maxlevels	Maximum number of location hierarchy levels to fetch at a time.
common.hierarchy.merch.chainid	Identification number of the merchandise hierarchy chain.
common.hierarchy.loc.chainid	Identification number of the location hierarchy chain.
common.jdbc.oracle.fetchsize	The JDBC fetch size for result set on a Oracle database.
common.jdbc.db2.fetchsize	The JDBC fetch size for result set on a DB2 database.
common.dump.csv.forecast.response	Use this parameter to specify that .csv files are created for forecast response.

**Table 10–2 (Cont.) Parameters in the suite.properties File**

Parameter	Description
common.help.columnDef	Use this parameter to specify the HTML online help file that contains the column definitions for context-sensitivity.
common.help.customizeTable	Use this parameter to specify the HTML online help file that contains the customized table definitions for context sensitivity.
common.help.printExport	Use this parameter to specify the HTML online help file that appears when an user chooses to print or export information on the user interface.
delphi.rmi.host	Use this parameter to specify the Delphi URL for interactive Calculation Engine use.
delphi.rmi.port	Use this parameter to specify the Delphi port for interactive Calculation Engine use.
suite.loginform.autocomplete	Use this parameter to use the AutoComplete feature in the User Management utility.
suite.httpsession.timeout	Use this parameter to specify the duration, in seconds, for the HTTP session time out. This parameter applies across the suite.
suite.userlogin.timeout	Use this parameter to specify the duration, in seconds, for the user login time out. This parameter applies across the suite.
suite.cookie.secure	Use this parameter to specify a secure cookie. This parameter applies across the suite.
suite.cookie.domain	Defines the domain where the SSO cookie is. If left empty, then the default value is used.
suite.logoutpage.show	Used when COE is integrated with Oracle SSO. Either shows successful logout page or redirects to login page. Default is false.
suite.logintimeout.manage	Use this parameter to manage login time outs. The value defaults to <i>Fault</i> , and indicates the login time out defaults to session time out.
common.spread.fontname	Use this parameter to specify the font used in the Spread feature.
hierarchy.displayType	Use this parameter to set the hierarchy display type that displays in the hierarchy control. The acceptable values are ID, DESC, ID-DESC, and DESC-ID.
audit.groupname.excluded	Use this parameter to specify the list of audit event groups that will not be logged. The value defaults to USER_GROUP, and indicates that all User Management events are excluded. To log auditing, leave the value blank. A value of MDO_WS_GROUP turns off auditing of the worksheet status. A value of COS_GROUP turns off auditing of the remote user. For the Grid Designer: add for Grid Designer: Excluding GD_GROUP will turn off auditing for GD_SAVE, GD_PUBLISH, GD_BACKUP actions
copyright.date	Used by Installer to resolve the copyright date.

## gdconfig.properties Settings

The following settings are contained in `gdconfig.properties`. These properties are used with the Grid Designer.

**Table 10–3** *Parameters in the `gdconfig.properties` File*

Parameter	Description
<code>gd.resource.supported.locales</code>	Lists the locales supported by the application. It must only be updated when new supported languages are added to the product.
<code>gd.resource.configured.locales</code>	Sets the default locale used in the Resource Browser Editor.
<code>gd.publish.conf.host.names</code>	Lets you set up a list of host names in a cluster where you want to publish the configuration. For standalone applications, leave this value blank.

