Oracle® In-Memory Performance-Driven Planning

Systems Guide

Release 12.2

Part No. E52287-01

July 2014

ORACLE®

Oracle In-Memory Performance-Driven Planning Systems Guide, Release 12.2

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Contents

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Preface

Intended Audience

Welcome to Release 12.2 of the *Oracle In-Memory Performance-Driven Planning Systems Guide.*

See Related Information Sources on page vii for more Oracle E-Business Suite product information.

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

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Structure

1 Oracle In-Memory Performance-Driven Planning Overview
2 PDP Requirements
3 Performance-Driven Planning Features

Related Information Sources

Oracle E-Business Suite on Exadata

This tutorial covers the installation and implementation best practices for running Oracle E-Business Suite on Oracle Exadata. Visit

https://apex.oracle.com/pls/apex/f?p=44785:24:0::NO:24:P24_CONTENT_ID,P24_PREV_PAGE:5368,29.

Exalogic Hardware Tour

This video walks you through the different hardware components in a real Exalogic machine, with particular attention given to redundancy and serviceability. Visit https://apex.oracle.com/pls/apex/f?p=44785:24:0::NO:24:P24_CONTENT_ID,P24_PREV_PAGE:6785,29.

Oracle Exalogic Demo Series

This series of recorded demonstrations highlights that core features, capabilities, and tools available in Oracle Exalogic Elastic Cloud. Visit https://apex.oracle.com/pls/apex/f?p=44785:24:0::NO:24:P24_CONTENT_ID,P24_PREV_PAGE:5115,2.

Integration Repository

The Oracle Integration Repository is a compilation of information about the service endpoints exposed by the Oracle E-Business Suite of applications. It provides a complete catalog of Oracle E-Business Suite's business service interfaces. The tool lets users easily discover and deploy the appropriate business service interface for integration with any system, application, or business partner.

The Oracle Integration Repository is shipped as part of the E-Business Suite. As your instance is patched, the repository is automatically updated with content appropriate for the precise revisions of interfaces in your environment.

Users who are granted the Integration Analyst role can navigate to the Oracle Integration Repository through the Integration Repository responsibility. Users who have the Integration Developer role or the Integration Administrator role can access the Oracle Integration Repository through the Integrated SOA Gateway responsibility.

Do Not Use Database Tools to Modify Oracle E-Business Suite Data

Oracle STRONGLY RECOMMENDS that you never use SQL*Plus, Oracle Data Browser, database triggers, or any other tool to modify Oracle E-Business Suite data unless otherwise instructed.

Oracle provides powerful tools you can use to create, store, change, retrieve, and maintain information in an Oracle database. But if you use Oracle tools such as SQL*Plus to modify Oracle E-Business Suite data, you risk destroying the integrity of your data and you lose the ability to audit changes to your data.

Because Oracle E-Business Suite tables are interrelated, any change you make using an Oracle E-Business Suite form can update many tables at once. But when you modify Oracle E-Business Suite data using anything other than Oracle E-Business Suite, you may change a row in one table without making corresponding changes in related tables. If your tables get out of synchronization with each other, you risk retrieving erroneous

information and you risk unpredictable results throughout Oracle E-Business Suite.

When you use Oracle E-Business Suite to modify your data, Oracle E-Business Suite automatically checks that your changes are valid. Oracle E-Business Suite also keeps track of who changes information. If you enter information into database tables using database tools, you may store invalid information. You also lose the ability to track who has changed your information because SQL*Plus and other database tools do not keep a record of changes.

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Oracle In-Memory Performance-Driven Planning Overview

This chapter covers the following topics:

- Introduction
- Oracle Value Chain Planning
- Oracle In-Memory Performance-Driven Planning
- PDP Leverages the Oracle Exadata Engineered System

Introduction

Oracle Value Chain Planning applications deployed on Oracle Engineered Systems provides increased scalability and performance solutions. To further increase the levels of scalability and performance, the applications themselves must be engineered to take full advantage of the available technology. Oracle In-Memory Performance-Driven Planning (PDP) is part of the Oracle Value Chain Planning (VCP) suite of products and enables near real-time interactive planning, simulation, and analysis.

Oracle Value Chain Planning

VCP manages supply chain flows (outbound finished goods, inbound supplies, inter-facility and company shipments, service parts, and reverse logistics), performs mixed modes of manufacturing (discrete, configure-to-order, project, process, and lean), and operates across geographic areas (regional and global).

Oracle Value Chain Planning can simultaneously operate with Enterprise Resource Planning (ERP) systems, both Oracle and non-Oracle. Companies can support the nuances of their global operations while reaping the efficiencies available by a single planning solution.

Oracle Value Chain Planning provides support for planning business functions such as demand planning, forecasting and consensus demand management, promotion

planning and optimization, integrated business planning, network design, risk management and postponement, tactical supply and distribution planning, and event-driven simulation.

For more information, visit the Oracle Value Chain Planning [http://www.oracle.com/us/products/applications/ebusiness/planning/052838.html] page on the Oracle website.

Oracle In-Memory Performance-Driven Planning

Oracle In-Memory Performance-Driven Planning (PDP) is an engineered system product that includes features within the Value Chain Planning suite of products and optimizes them for Oracle Exadata hardware (and optionally Oracle Exalogic).

PDP provides out-of-box configuration and tuning for VCP products to run on Oracle Exa hardware. It enables you to fully leverage the Exa hardware and run VCP Applications extremely fast. In particular, PDP provides in-memory analytics in the Oracle Advanced Planning Command Center (APCC)

Oracle In-Memory Driven Planning takes advantage of the capabilities uniquely available in Oracle Exadata and Oracle Exalytics. For example, Oracle In-Memory Planning enables Oracle Real Application Cluster (RAC)support for VCP to use Oracle Exadata's Active GridLink for Oracle RAC. This provides increased parallelism and scalability and enables faster performance for database intensive planning processes such as:

- Data collection

- Plan snapshot

- Plan flush

This results in shorter planning times for VCP products such as:

- Oracle Rapid Planning

- Oracle Advanced Supply Chain Planning

- Oracle Inventory Optimization

- Oracle Service Parts Planning

- Oracle Advanced Planning Command Center

APCC provides embedded analytics as well as the analysis layer for all VCP products. Between the running of planning processes and the analysis, the plan output is archived and transformed into pre-aggregated business metrics for dashboards, reports, and ad-hoc queries. PDP significantly reduces run times of several key batch processes, and totally eliminates many batch processes altogether.

Note: Oracle In-Memory Performance-Driven Planning is a distinct and separately licensed product.

Important: Due to the large volume of consumption data required to generate a forecast and plan at a very granular level, the PDP module must be installed with and run on the Oracle Exadata database machine. For optimal performance, Oracle also recommends implementing the Oracle Exalogic server.

PDP Leverages the Oracle Exadata Engineered System

PDP leverages the following specific capabilities within the Exadata engineered system:

- Smart Scan Technology

- Smart Flash Cache

- Hybrid Columnar Compression

- High-bandwidth, low latency 40 GB/Sec Infiniband network

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PDP Requirements

Requirements and Recommendations

To run PDP, the following products must be installed:

Product	Description
Oracle Advanced Planning Command Center	Version 12.1.3.9 or higher.
Oracle Business Intelligence Enterprise Edition	Version 11.1.1.6.5
Oracle Exadata (all X3 series) Hardware and Software	Oracle Exadata must run Oracle Database 11g R2 or higher.
WebLogic	Version 11gR1 patch set 5

If you are running Oracle Rapid Planning or Oracle Demantra products, or if you are working with large volumes of data, it is recommended that you also run Oracle Exalogic Hardware and Software.

Oracle Exadata Database Machine

Oracle Exadata Database Machine is the preferred platform to use with VCP products because of its performance and advanced connection capabilities to Oracle Exalogic and Oracle Exalytics. Due to extensive tuning, the hardware(Oracle Exadata Database Machine) and the software (VCP) are engineered to work together.

Oracle Exalytics In-Memory Machine

It is recommended that you use PDP in conjunction with the Oracle Exalytics

In-Memory This hardware consists of a single server that is optimally configured for in-memory analytics for business intelligence workloads and includes powerful compute capacity, abundant memory, and fast networking options.

For more information, see the *Oracle Exalytics Installation and Administration Guide*.

Oracle Exalogic Elastic Cloud

The Oracle Exalogic Elastic Cloud (EEC) is an Oracle Engineered System, consisting of software, firmware and hardware. Oracle business applications, Oracle Fusion Middleware or third-party software products can be deployed on EEC. Oracle Exalogic is designed to eliminate a single-point-of-failure through hardware redundancy and automated failover for every major component including power, I/O and cooling.

For more information, see the *Oracle Exalogic Elastic Cloud Installation and Configuration Guide*.

Configuration Requirements

Configuring JDBC Data Sources

When configuring PDP with Rapid Planning for Exadata, the Java Database Connection (JDBC) data source needs to be updated. Delete the old data source and create a new one for Exadata. The host name or URL should include the TNS entry for database RAC instead of single node.

Example of a TNS string:

(DESCRIPTION=(ADDRESS_LIST=(LOAD_BALANCE=YES)(FAILOVER=YES)
(ADDRESS=(PROTOCOL=tcp)(HOST=DB_NODE_A_URL)(PORT=1234))
(ADDRESS=(PROTOCOL=tcp)(HOST=DB_NODE_B_URL)(PORT=1234)))
(CONNECT_DATA= (SERVICE_NAME=VIS)))

Replace DB_NODE_A_URL and DB_NODE_B_URL with the URLs for the database nodes. This needs to be done for the RP Engine and the UI domain.

For more information, refer to the *Oracle Rapid Planning Installation Guide*.

Profile Options

MSC: Enable In-Memory Performance Driven Planning

Use this profile option to control whether the inter process communication will use Advanced Queues or DBMS_PIPES. This impacts the following:

- All types of plan runs (ASCP/DRP/IO/SPP)

- On-line planner for ASCP/DRP

- ASCP Data Collection runs

When the profile option MSC: Enable In-Memory Performance Driven Planning is set to Yes, the inter-process communication uses Advanced Queues.

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Performance-Driven Planning Features

This chapter covers the following topics:

- Introduction
- Oracle Real Application Clusters
- Parallel Execution of SQL and DML
- Planning Analytics
- Advanced Visualization Capabilities for APCC

Introduction

When deployed on Oracle Exadata and Oracle Exalytics hardware, PDP enables the following features:

- Full support of Oracle Real Application Clusters in the following products:

    - Oracle Advanced Supply Chain Planning

    - Oracle Inventory Optimization

    - Oracle Service Parts Planning

    - Oracle Global Order Promising

    - Oracle Advanced Planning Command Center

        Note: These features are available when Planning Command Center for Oracle Engineered Systems is deployed in Oracle Exadata hardware.

- Parallel Execution of queries and Data Manipulation Language (DML) in the following products:

- Oracle Advanced Supply Chain Planning

- Oracle Inventory Optimization

- Oracle Service Parts Planning

- Oracle Global Order Promising

- Oracle Advanced Planning Command Center

    > **Note:** These features are available when Planning Command
    > Center for Oracle Engineered Systems is deployed in Oracle
    > Exadata hardware.

- Visualization capabilities in Advanced Planning Command Center

Oracle Real Application Clusters

The following VCP products support Oracle Real Application Clusters (RAC), but in a limited capacity (single-nodes only):

- Advanced Supply Chain Planning

- Inventory Optimization

- Service Parts Planning

- Global Order Promising

- Advanced Planning Command Center

When these products are deployed with PDP or Oracle Distribution Requirement Planning (DRP) on Oracle Exadata, they support the multi-node RAC architecture.

For more information, see the *Oracle Real Application Clusters Administration and Deployment Guide*.

Parallel Execution of SQL and DML

Hardware systems like Oracle Exa hardware have large amounts of memory capacity. The aggregated database buffer cache of an RAC environment supports the caching of objects of up to one terabyte.

In-Memory Parallel Execution (In-Memory PX) introduced in Oracle Database 11g Release 2, takes advantage of this large aggregated database buffer cache.

Planning Command Center for Oracle Engineered Systems enables Parallel Execution of

SQL queries and DML in three key areas where there are requirements of large batch processing:

- Collections

- Snapshot

- Plan Archival of APCC

The VCP data tables will have parallelism enabled and the degree of parallelism will have a default standard (Auto Degree of Parallelism).

Planning Analytics

Deployed on Oracle Exadata In-Memory Database, Oracle Value Chain Planning's In-Memory Performance Driven Planning enables you to create a personalized watch list of key performance indicators with configurable thresholds that notify you when certain specific exception conditions occur. Operational planners receive immediate alerts when plan results deviate from enterprise targets or from previous plans.

Advanced Visualization Capabilities for APCC

PDP contains charts which provide advanced visualization capabilities for APCC. These charts help you visualize dense multi-dimensional, multi-page data on a single screen and provide multiple visualizations across a common axis scale for easy comparison.

PDP contains three seeded charts:

- Total Demand, Projected Availability by Category

- Safety Stock, Projected Available Balance by Item

- Exception Summary

Total Demand, Projected Availability by Category

This report can be accessed in the Plan Health Summary tab of the Supply Chain Analyst dashboard. This chart shows an area-type graph and displays the following:

- Total Demand

- Projected Available Balance – Units

The enabled dimensions are as follows:

- Plan (Base Plan and Compare Plans selected in the page prompts)

- Categories (Filtered based on page prompts)

- Organizations (Filtered based on page prompts)

The following is an example of the Total Demand, Projected Availability by Category chart:

Safety Stock, Projected Available Balance by Item

This report can be accessed in the Plan Health Summary tab of the Supply Chain Analyst dashboard. This chart shows an area-type graph and displays the following:
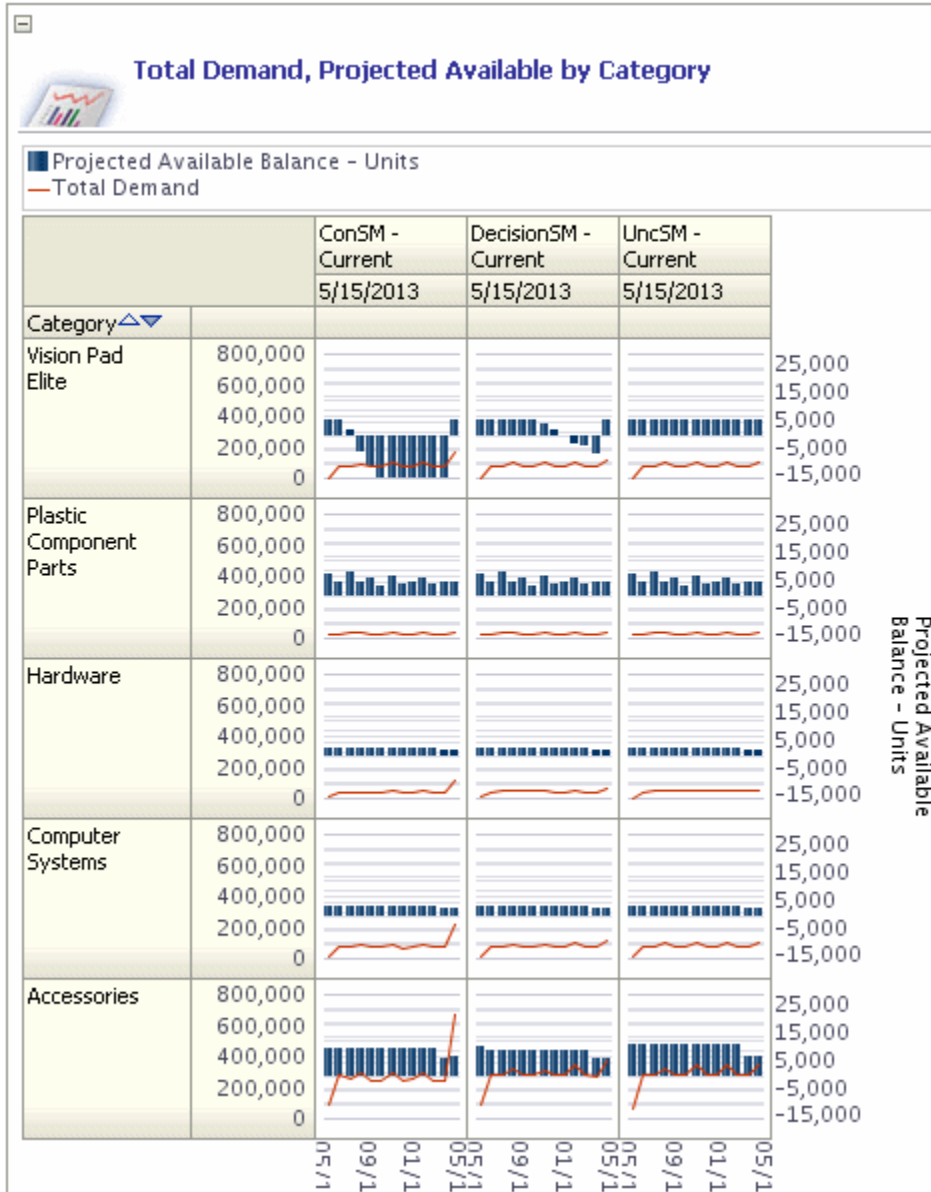
- Safety Stock

- Projected Available Balance – Units

The enabled dimensions are as follows:

- Plan (Base Plan and Compare Plans selected in the page prompts)

- Categories (Filtered based on page prompts)

- Organizations (Filtered based on page prompts)

The following is an example of the Safety Stock, Projected Available Balance by Item chart:

Exception Summary

This report can be accessed in the Exceptions tab of the Supply Chain Analyst dashboard. This chart shows an area-type graph and displays the following:

- Exception count
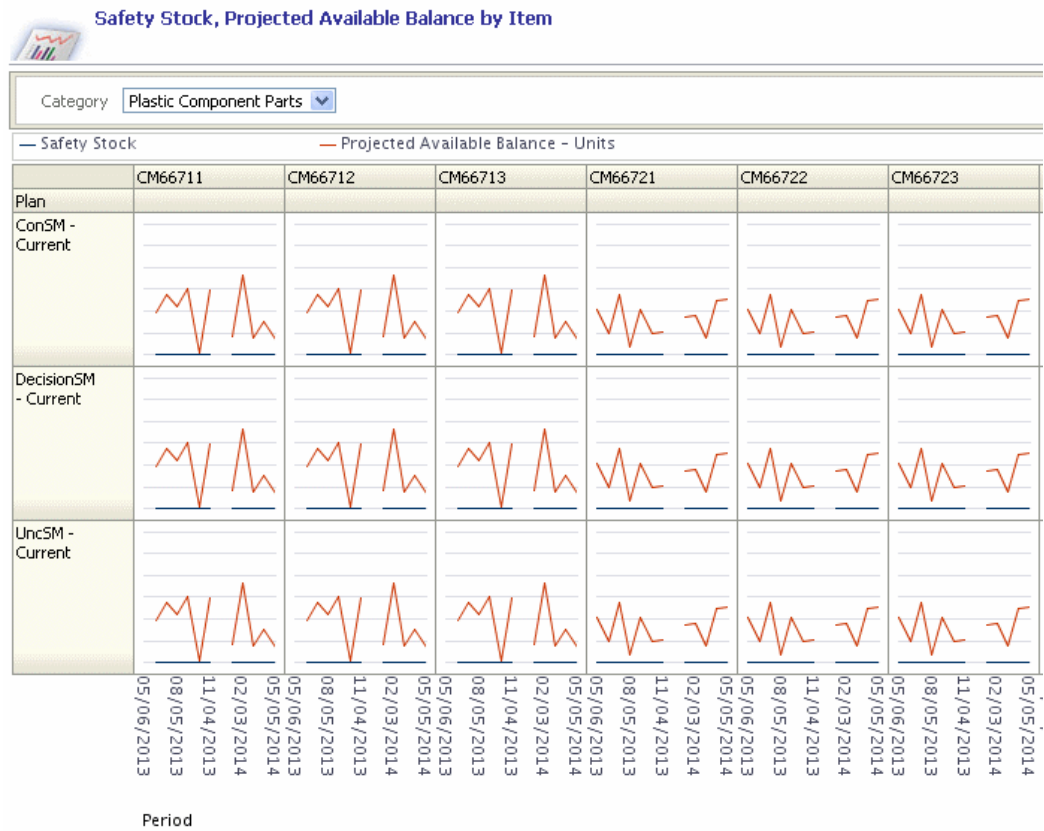
- Exception value

The enabled dimensions are as follows:

- Plan (Base Plan and the comparison plans selected in page prompts)

- Category

- Exception Type

The following is an example of the Exception Summary chart:

View Weekly Count graph

Category (ASCP Item Category)	Exception Type	ConSM - Current	DecisionSM - Current	UncSM - Current
		Counts	Counts	Counts
ASSEMBLY.SUBASSY	Items below safety stock			
	Order lead time constraint			
	Order sourced from alternate facility			
	Requirement lead time constraint			
COMPONENT.ELECTRICAL	Items below safety stock			
	Items with no activity			
	Material constraint			
	Order lead time constraint			
	Orders with compression days			
	Supplier capacity overloaded			
COMPONENT.MECHANICAL	Order lead time constraint			
	Orders with compression days			
COMPONENT.PLASTIC	Requirement lead time constraint			
COMPUTER.VPADADV	Late replenishment for forecast			
	Order lead time constraint			
	Orders with compression days			
	Requirement lead time constraint			
COMPUTER.VPADELITE	Items below safety stock			
	Late replenishment for forecast			
	Order lead time constraint			
	Requirement lead time constraint			