

Oracle® Inventory Optimization

Users Guide

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Oracle Inventory Optimization Users Guide, Release 12.2

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- Did you understand the context of the procedures?
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- Do you need different information or graphics? If so, where, and in what format?
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Preface

Intended Audience

Welcome to Release 12.2 of the *Oracle Inventory Optimization Users Guide*.

Welcome to the Oracle Inventory Optimization User's Guide, Release 12.

This guide assumes you have a working knowledge of the following:

- The principles and customary practices of your business area.
- Oracle Advanced Supply Chain Planning and Oracle Inventory Optimization
If you have never used Oracle Advanced Planning or Oracle Inventory Optimization, Oracle suggests you attend one or more of the Oracle Applications training classes available through Oracle University.
- Oracle Self-Service Web Applications
To learn more about Oracle Self-Service Web Applications, read the *Oracle Self-Service Web Applications Implementation Manual*.
- The Oracle Applications graphical user interface
To learn more about the Oracle Applications graphical user interface, read the *Oracle E-Business Suite User's Guide*.
- See Other Information Sources for more information about Oracle Applications product information.

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

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Structure

1 Overview

This chapter describes Oracle Inventory Optimization and its benefits. It also provides an overview of how Oracle Inventory Optimization works and its input and output data.

2 Defining an Inventory Plan

3 Inventory Plan Options

This chapter details various options that you can set for your inventory plan by using Oracle Inventory Optimization.

4 Key Setups

This chapter describes the key setups such as the target service levels and performance indicators that you need to specify before you run your inventory plan.

5 Viewing Output

This chapter details how to view the output after you run an inventory plan.

6 Analysis Workbench

This chapter describes the Analysis Workbench and how you can use it to analyze your inventory plans.

7 Managing Inventory and Safety Stock

This chapter documents procedures for planning safety stock inventory.

8 Oracle Inventory Optimization and Asset Intensive Planning

9 Oracle Inventory Optimization Warehouse Capacity Constraints and Cycle Inventory Safety Stock

10 Accounting for Cycle Inventory in Safety Stock Calculation

11 Service Parts Planning

12 Cross-Product Integration

This chapter details the integration between Oracle Inventory Optimization and Oracle Demand Planning.

A Profile Options

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Related Information Sources

Oracle Inventory Optimization shares business and setup information with other Oracle Applications products. Therefore, you may want to refer to other guides when you set

up and use Oracle Inventory Optimization.

You can access other guides from the Oracle E-Business Suite Online Documentation Library CD that was included with your media pack:

- Oracle E-Business Suite User's Guide
- Oracle Advanced Planning Command Center User's Guide
- Oracle Advanced Supply Chain Planning Implementation and User's Guide
- Oracle Bills of Material User's Guide
- Oracle Collaborative Planning Implementation and User's Guide
- Oracle Demand Planning User's Guide
- Oracle E-Business Suite Upgrade Guide: Release 11i to Release 12.1.1
- Oracle E-Business Suite Installation Guide: Using Rapid Install
- Oracle Global Order Promising Implementation and User's Guide
- Oracle Inventory Optimization User's Guide
- Oracle Inventory User's Guide
- Oracle Manufacturing Operations Center Implementation Guide
- Oracle Order Management Using Oracle Workflow in Oracle Order Management
- Oracle Production Scheduling Implementation Guide
- Oracle Project Manufacturing User's Guide
- Oracle Project Manufacturing Implementation Guide
- Oracle Purchasing User's Guide
- Oracle Service Parts Planning Implementation and User's Guide
- Oracle Shopfloor Management User's Guide
- Oracle Strategic Network Optimization Implementation Guide
- Oracle Work in Process User's Guide
- Oracle Workflow User's Guide

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.

You can navigate to the Oracle Integration Repository through Oracle E-Business Suite Integrated SOA Gateway.

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.

Overview

This chapter describes Oracle Inventory Optimization and its benefits. It also provides an overview of how Oracle Inventory Optimization works and its input and output data.

This chapter covers the following topics:

- Overview of Oracle Inventory Optimization
- Stochastic Optimization Technology
- Business Process
- Key Inventory Decisions
- Input
- Output
- BIS Key Performance Indicators

Overview of Oracle Inventory Optimization

Oracle Inventory Optimization is a comprehensive Internet-based inventory planning solution that enables you to determine when and where to hold your inventories across the supply chain to achieve the desired customer service levels. You can factor in criteria such as demand variability and supply lead time variability when you make your inventory decisions. It is a strategic planning tool that can help you address the following key business issues:

- How can I improve customer service while reducing inventory?
 - Where do I position my inventories?
 - How can I manage demand and supply variability?
- What service levels can I achieve given specific budgets and other constraints?

The following are the key capabilities of Oracle Inventory Optimization:

- Oracle Inventory Optimization uses stochastic optimization technology that enables you to factor in the multilevel supply chain network and interdependence of demand variability and supply lead time variability when generating time-phased safety stock recommendations.
- Oracle Inventory Optimization enables you to evaluate multiple inventory planning scenarios and graphically compare the results. The planning scenarios for example can include different sets of customer service levels, budget constraints, and capacity constraints.
- Oracle Inventory Optimization is integrated with Oracle's E-Business Suite and Advanced Planning products including Oracle Advanced Supply Chain Planning and Oracle Demand Planning. This enables collaboration between these applications. For example, the safety stock recommendations of Oracle Inventory Optimization can be automatically fed into Oracle Advanced Supply Chain Planning to drive tactical supply chain planning decisions.

Stochastic Optimization Technology

Stochastic optimization is a technique for prudent decision-making under uncertainty. Stochastic optimization considers:

- Factors that you are trying to maximize or minimize. For example, you would want to maximize service level and profit and minimize cost.
- Factors that you have under control. For example the investment on inventory when there are no budget constraints.
- The limiting factors of your plan such as service level and budget constraints.

Oracle Inventory Optimization uses this technology to help you manage the uncertainty inherent to your business decisions. Based on your requirements and objectives, you can determine the optimal inventory stocking levels and other operational policies.

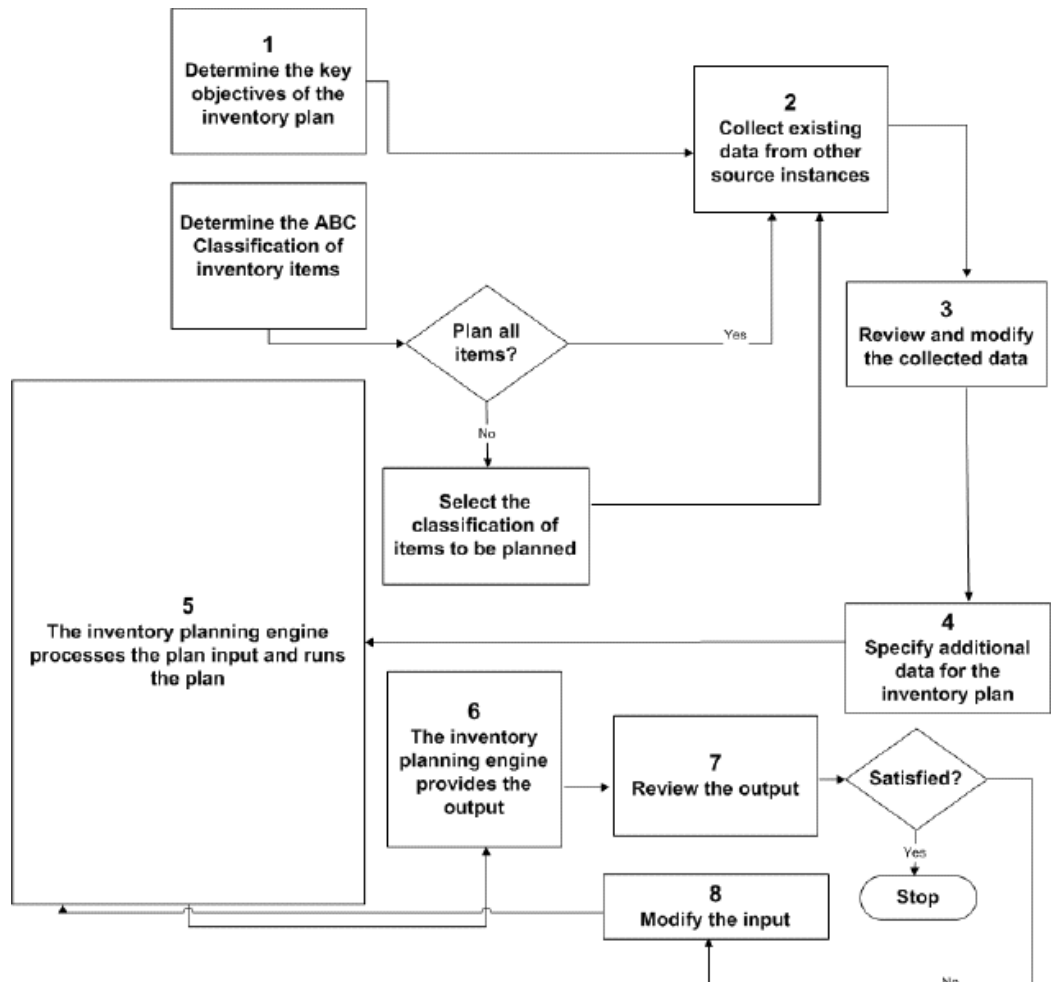
Oracle Inventory Optimization enables you to:

- Determine the optimal inventory levels across the supply chain, which improves customer service while lowering inventory investment.
- Consider uncertainty in demand and supply.
- Manage variability and risk.
- Evaluate cost and risk trade-off.
- See a graphical representation of your strategic inventory plan.

- Plan telescoping time horizons.
- Provide accurate inputs to tactical plans.
- Manage key performance indicators (KPIs) and drive continuous improvement.

Business Process

The following diagram describes the business process flow for Oracle Inventory Optimization:



The following steps summarize the business process flow depicted in the diagram:

1. Determine the key objective of the inventory plan by linking to Corporate Balanced Scorecard.
2. Collect existing data from other source instances. For detailed information about

collections, see *Oracle Advanced Planning Implementation and User's Guide*.

3. Review the data collected by the inventory planning engine and make changes as needed.
4. Specify additional inputs for the inventory plan. The following are the data that you can specify:
 - Service level policy
 - Inventory budget (optional)
 - Supplier lead time variability
 - Safety stock levels
 - Minimum and maximum inventory levels
5. The inventory planning engine processes the input and runs the inventory plan.
6. The inventory planning engine reports the results after running the inventory plan.
7. Review the output generated by the inventory planning engine.
8. If the inventory plan is not optimal, make changes to the input. Step 3 through 6 are repeated until the inventory plan is optimal.

For information on what Oracle Inventory Optimization takes as input, see *Input*, page 1-5.

For information on what Oracle Inventory Optimization provides as output, see *Output*, page 1-6.

For information on setting up Oracle Inventory Optimization, see *Oracle Advanced Planning Implementation and User's Guide*.

Key Inventory Decisions

Some of the key factors that can influence your decision factors are:

- Service Level Decision Factors, page 1-5
- Safety Stock Decision Factors, page 1-5
- Inventory Location Decision Factors, page 1-5

Service Level Decision Factors

Service level is a measure of satisfying demand through inventory or by the current production schedule to satisfy the customers' requested delivery dates and quantities. The decision on service level may depend on factors such as your business objectives, budget constraints, and targeted profit. For example, profits may rise as you increase the service level. However, increased service level beyond a certain point may not increase the profits because of the relative increase in inventory costs. Therefore, if your service level is driven by profit, you need to determine the most profitable scenario with an acceptable service level.

The service level may also influence your safety stock level and inventory location. For example, if you are targeting a high service level, you may want to reduce the transportation lead time by locating your inventory close to your customers.

Safety Stock Decision Factors

As safety stock can provide a buffer against uncertainty, you may want to consider the variability in demand and supply when you calculate the safety stock level. In many cases, the degree of variability in supply and demand changes over time. You need to consider all possible scenarios when you calculate safety stock.

Inventory Location Decision Factors

The decision on where to locate your inventory can be a trade-off between several factors such as supplier lead times, transportation lead time, manufacturing lead time, and the flexibility of your manufacturing system. For example, when you store safety stock in the form of finished goods, the manufacturing lead time for those finished goods decreases. However, the components and materials used in making those finished goods are committed and you cannot use them to meet unexpected customer requirements. Therefore, if your safety stock is in the form of raw materials, then you may want to locate your inventory close to your manufacturing plant.

Input

Oracle Inventory Optimization takes the following information as input:

- Demand uncertainty
- Customer service level for each demand

If the customer service level is specified at a deeper level of granularity, the service level value will apply to all independent demands for that customer.

- Supplier lead time variation

- Supply chain network in the form of sourcing rules and bill of distribution
- List of items to be included in the plan
- Bills of material including effectivity
- Routings and key resources for items
- Capacity constraints
Capacity constraints can be in the form of supplier capacity, transportation capacity, and resource availability or line rates.
- Cost elements
Cost can include production cost, item cost, carrying cost percentages, purchase cost, transportation cost, and resource cost.

You can establish the following instances as eligible source instances for Oracle Inventory Optimization:

- Oracle Applications R11 (Discrete or Process Manufacturing)
- Oracle Applications R11*i* (Discrete or Process Manufacturing)
- Oracle Applications R12 (Discrete or Process Manufacturing)

Output

The output of Oracle Inventory Optimization is a time-phased strategic inventory plan. More specifically, output includes the following:

- Time-phased constrained and unconstrained safety stock levels for each item
You can specify the time-phased constrained safety stock quantities as input to Oracle Advanced Supply Chain Planning in the form of demand plan(s).
- Recommended service levels
- Key performance indicators
- Recommendations and exception messages such as for service level and budget violations
- Total cost of achieving the target customer service level and the individual cost elements that make up the total cost

BIS Key Performance Indicators

Oracle Inventory Optimization is integrated with Oracle Business Intelligence System's Performance Management System. You can set your organizational objectives using Oracle Business Intelligence System.

You can use key performance indicators to drive continuous improvement in your enterprise. You can set performance targets and exception tolerances by business units or by period and automatically notify the appropriate people when exceptions arise.

Note: Organizational objectives are referred to as Performance Measures in Oracle Business Intelligence System and as key performance indicators in Oracle Inventory Optimization and Oracle Advanced Supply Chain Planning

Defining an Inventory Plan

Running an Inventory Plan

Before you run an inventory plan, complete the prerequisite tasks. For information on how to perform these tasks, see the *Oracle Advanced Planning Implementation and User's Guide*.

To create and launch an inventory plan:

Prerequisites

- ☐ Set up each planned organization on the source instance.
- ☐ Direct the collection programs to collect data from the transactional instance of each planned organization.
- ☐ Enable the items to be planned in each organization that can produce or distribute the item. During item setup, you can enable items in all organizations or only in specific organizations.
- ☐ Set up bills of material.
- ☐ Enable the routings and bills of resource for each planned item in all planned organizations.
- ☐ Enable the suppliers and sourcing rules in all relevant organizations.

Steps:

1. Sign in using the Inventory Planner responsibility.
2. Choose Inventory Plan > Names.

The Inventory Plan Names window appears.

The following table describes the fields in the Inventory Plan Names window.

Field	Description
Name	Name of the plan.
Description	Description of the plan.
Inactive Date	The date until when the plan is active.

3. Click Plan Options.

The Plan Options window appears.

4. Continue setting plan options and parameters.

Only selected organizations are planned regardless of whether planned items, routings, and so on have been enabled in other organizations.

5. Click Launch Plan in the Inventory Plan Names window.

The Parameters window appears.

The following table describes the fields in the Parameters window.

Field	Description
Plan Name	Name of the plan.
Launch Snapshot	Set it to "yes" if you want the inventory planning engine to snapshot data such as items and BOMs.
Launch Planner	Set it to "yes" if you want the inventory planning engine to run the netting.
Anchor Date	The plan start date is displayed by default. For more information, see <i>Oracle Advanced Planning Implementation and User's Guide</i> .

6. Click OK in the Parameters window after you have verified the parameters.

The parameters appear in the Parameters field in the Launch Inventory Plan window.

7. Click Submit to launch the plan.

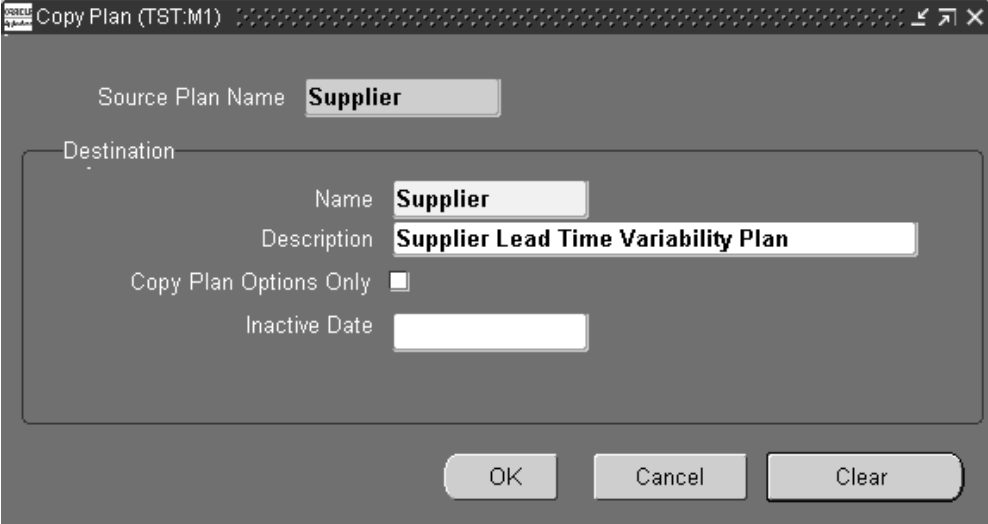
Copying an Inventory Plan

To copy an inventory plan, follow these procedure steps:

Steps:

1. Select a plan in the Inventory Plan Names window.
2. Click Copy Plan. The Copy Plan window appears.

Copy Plan window



The screenshot shows a window titled "Copy Plan (TST:M1)". Inside the window, there is a "Source Plan Name" field with the value "Supplier". Below this is a "Destination" section containing four fields: "Name" with the value "Supplier", "Description" with the value "Supplier Lead Time Variability Plan", "Copy Plan Options Only" with an unchecked checkbox, and "Inactive Date" with an empty date field. At the bottom of the window are three buttons: "OK", "Cancel", and "Clear".

3. Enter information for the new plan in the Name and Description fields.
4. To copy only the plan options, select Copy Plan Options Only.
5. Enter the inactive date for the new plan.
6. Click OK.
7. Save your work.

Inventory Plan Options

This chapter details various options that you can set for your inventory plan by using Oracle Inventory Optimization.

This chapter covers the following topics:

- Plan Options Overview
- Plan Options
- Planned Items: ABC Classification
- Selecting Planned Items
- The Main Tabbed Region
- Plan Start Date in Future
- Plan End Date
- The Organizations Tabbed Region
- Using an Existing Plan as a Demand Schedule For a New Plan
- Setting Demand Variability
- Cumulative Demand Distribution
- How Probability Data is Used by Oracle Inventory Optimization
- Weighted Average Calculation
- How to Assign Forecasts and Forecast Sets to Scenario Sets
- Specifying Sources of Demand
- The Constraints Tabbed Region
- Service Level and Fulfillment Lead Time
- Lead Time Variability
- Inventory Budget

Plan Options Overview

Several factors define the basis for calculating optimal levels of inventory. The level of inventory you hold has an impact on the service level that you can offer. You can set various plan options in Oracle Inventory Optimization based on your requirements. For example, you can specify the desired service level and calculate the safety stock required to achieve the service level. You can also specify budget constraints.

Plan Options

This section describes plan options. The plan options appear in the following tabbed regions of the Plan Options window:

- Main, page 3-4
- Organizations, page 3-9
- Constraints, page 3-19

You can access the plan options, via either of the following navigation methods:

- From the Navigator select Inventory Plan > Options, or.
- From the Navigator select Inventory Plan > Names. From the Plan Names form, select a plan, and then click Plan Options.

This table describes the fields located in the header region of the Plan Options window.

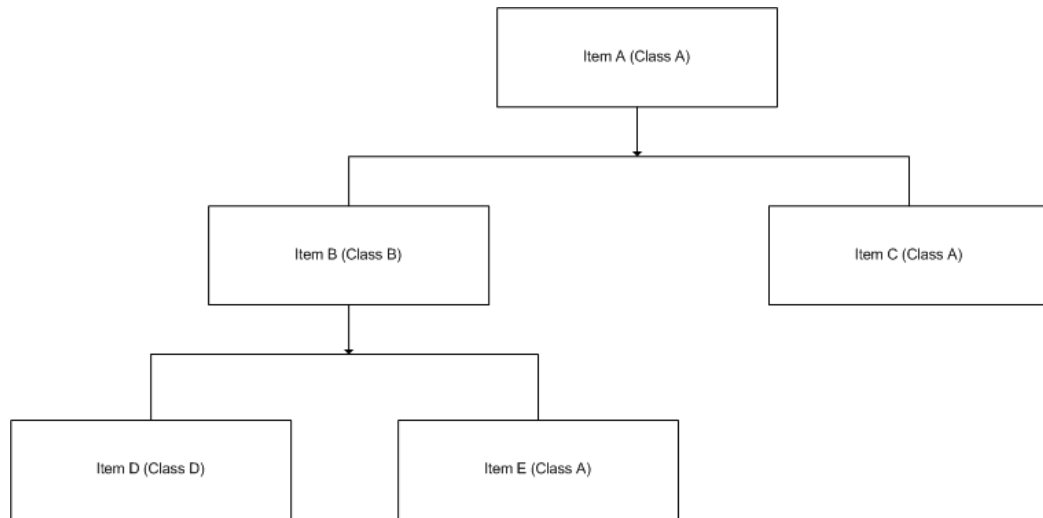
Field	Description
Plan	This field contains the Plan Name. The Plan description field appears in the next field to the right.
Planned Items	The selected ABC classification determines the planned items in this plan. For more information on how the inventory planner engine calculates the safety stock based on this classification, see Planned Items: ABC Classification, page 3-3.
Assignment Set	An assignment set is a named group of sourcing rules and bills of distribution that control replenishment of designated items and organizations.

Field	Description
Service Level Set	<p>A Service Level Set is a named group of specific service level targets and demand fulfillment lead times assigned to items, categories of items, customers, classes of demand, organizations, or combinations of these.</p> <p>See Defining Service Agreement Simulation Sets, page 4-4.</p>
Item Simulation Set	<p>Item attribute simulation sets enable Inventory Optimization plans to simulate changes to key item attributes. You attach values of key attributes to item-organizations or to item-regions, and then save those assignments under an item attribute simulation set name.</p> <p>Item Simulation Sets provide the ability to mass maintain planning-related item attributes. Planners can create multiple item simulation sets, with each simulation set addressing a set of "what-if" scenarios.</p> <p>See Defining Item Attribute Simulation Sets, page 4-7.</p>

Planned Items: ABC Classification

The inventory planner engine may include items that have a classification other than what you specify in the Planned Items field in the Plan Options window. Consider the following illustration that depicts the bill of material for Item A.

The inventory planner engine may include items that have a classification other than what you specify in the Planned Items field in the Plan Options window. Consider the following illustration that depicts the bill of material for Item A.



Item A belongs to class A. Items B and C are components of item A. Items B and C belong to classes B and A, respectively. Items D and E are components of item B. Items D and E belong to classes C and A, respectively. If you choose to plan for class A items, the inventory planner engine plans for items A, B, C, and E. The inventory planner engine includes item B in the plan because item E, a component of item B, belongs to class A.

Selecting Planned Items

Oracle Inventory Optimization calculates safety stock quantities only for those items whose safety stock planning method is set to MRP planned %. Safety stock quantities are not calculated for items whose safety stock planning method is set to Non-MRP planned.

The Main Tabbed Region

You can specify the plan start and end dates in the Main tabbed region. In addition, you can set various plan level penalty factors and details regarding changes to the safety stock.

Main tabbed region

The screenshot shows the 'Plan Options (TST.M1)' window with the 'Main' tab selected. The window has a title bar with standard window controls. Below the title bar, there are several input fields and sections:

- Plan:** SL90
- Planned Items:** Class AA (dropdown menu)
- Item Simulation Set:** (empty text field)
- 90% Service Level Plan:** (text field)
- Assignment Set:** TST:ASET-IO
- Service Level Set:** (empty text field)

Below these fields are three tabs: **Main** (selected), **Organizations**, and **Constraints**.

The main content area contains the following fields and sections:

- Plan Start Date:** 27-NOV-2006 (calendar icon)
- Plan End Date:** 17-DEC-2007
- Weeks:**
 - Start Date:** 27-NOV-2006
 - Buckets:** 52
- Periods:**
 - Start Date:** 17-DEC-2007
 - Buckets:** 0
- ☒ Calculate Key Performance Indicators
- ☐ Explode Forecast
- Plan Level Penalty Factors:**
 - Exceeding Material Capacity %: 10
 - Exceeding Transportation Capacity %: 10
 - Exceeding Resource Capacity %: 10
 - Demand Lateness %: (empty)
- Safety Stock Change Frequency:**
 - Safety Stock Change Interval: (empty) Days
 - Safety Stock Change Threshold Interval: (empty) %

Penalty factors are plan level values that:

- You can override by setting values for organizations and items in the source instance
- Override those set in profile options

The following table describes the fields and options in the Main tabbed region:

Field	Description
Plan Start Date	<p>If you have not run the plan, choose a start date for your plan; the default is beginning of the first planned time bucket. You can even specify a date in the future as your start date.</p> <p>If you have run the plan, this displays the planning horizon start date of the latest run.</p> <p>If you enter a start date in the middle of bucket, the inventory planning engine starts the plan on the first day of the bucket. You cannot change the start date of the plan when you copy one plan to another. For more information, see Plan Start Date in Future.</p>
Plan End Date	Calculated planning horizon end date based on your entries in Buckets and the owning organization calendar.
Start Date	Calculated start date for each bucket based on your entries in Buckets and the owning organization calendar. The value for the Days column is the Plan Start Date.
Buckets	Number of buckets of this bucket type.
Display Key Performance Indicators	Select this plan option to instruct the planning engine to calculate key performance indicators for the plan.
Explode Forecast	<p>Select this plan option to instruct the planning engine to explode forecasts as follows:</p> <ul style="list-style-type: none"> - Product family forecasts to item forecasts - Model forecasts to other model, option class, and item forecasts. <p>This option applies to items with forecasts with forecast control Consume and derive.</p> <p>If you clear this plan option, the explosion is assumed to happen in the source instance or in Oracle Demand Planning before the plan run.</p>
Exceeding material capacity %	Enter a numerical value to quantify the impact of exceeding material capacity.
Exceeding resource capacity %	Enter a numerical value to quantify the impact of exceeding resource capacity.
Exceeding transportation capacity %	Enter a numerical value to quantify the impact of exceeding transportation capacity.

Field	Description
Demand lateness %	Enter a numerical value to quantify the impact of late demand.
Safety Stock Change Interval	Enter the number of days that the inventory planning engine should hold the item safety stock levels constant. It does not recommend a change in safety stock levels during this time but may recommend a change after this time.
Safety Stock Change Threshold Interval	Enter the percentage of safety stock change that is significant to your business. When the inventory planning engine calculates a new recommended safety stock level for an item, it checks its percentage difference from the safety stock values of the previous adjacent change interval. If this percentage difference is lower than the this plan option, the inventory planning process does not recommend a change to the safety stock level for the item.

Plan Start Date in Future

If you consider immediate demand and supplies, your safety stock level requirements may vary across the horizon. For example, owing to short term jobs and on-hand, you may have an excess supply in the beginning of a horizon. As such, your safety stock requirement may be low. However, your safety stock requirements may be higher later in the planning horizon.

To calculate stable safety stock levels, you may want to consider demand in a relatively stable part of the horizon to determine long-term inventory holding policies.

To determine your plan start date, use the following guidelines:

- Determine the initial part of the plan horizon where you want to disregard the demand and supply. Select a date in future to avoid near-term supplies.
- Choose to start the plan after the initial time period in the plan horizon. The inventory planning engine validates the start date to ensure that it matches with the bucket start date.
- Review the safety stocks suggested by the plan across the horizon.

Consideration of existing supplies:

The inventory planning engine does not consider those supplies that are available before the plan start date. For example, the inventory planning engine considers the on-hand supplies if you specify the system date as the plan start date. However, if you specify a future date as the plan start date, the inventory planning engine ignores the on-hand supplies. You can use the Organizations tabbed region to indicate whether or

not you want the inventory planning engine to consider the net purchased supplies, work in process, and on-hand.

Consideration of demand and supplies available before the system date:

If you specify the system date as your plan start date, the inventory planning engine does not consider any demands and supplies that were available before the system date. This helps avoid issues arising out of huge backlogs and spikes in supplies required due to an increase in the near term demand.

Consideration of demand and supplies available before the plan start date in future:

The inventory planning engine does not consider past due forecasts, immediate forecasts, dependent demands, and their supplies to calculate safety stocks. The inventory planning engine calculates safety stock based on the demand and supply available after the start date in future so that you can plan accordingly.

Note: To determine the plan start date, you can use the planning time fence that works for most of your items. Alternatively, you can estimate the length of time until when the existing supplies are going to last. The inventory planning engine does not consider any dependent demands that are placed before the plan start date.

Consequences of changing the plan start date:

If you change the plan start date after selecting the safety stock change interval, the inventory planning engine displays a warning message as the safety stock change interval may not be valid in certain cases.

If the number of days in the planning horizon is less than the safety stock change interval, the inventory planning engine replaces the value of the safety stock change interval with null. In addition, the inventory planning engine displays a warning message prompting you to enter a different value for the safety stock change interval.

Defaulting of week start date or period start date:

The inventory planning engine defaults the week start date to be the plan start date. Conversely, if your plan does not consider weekly buckets, the inventory planning engine defaults the period start date to be the plan start date.

For example, the week start and end dates are D1 - D7, D8 - D14, D-15 - D21. If you define a plan starting in weekly buckets on day 11 (D11), the inventory planning engine starts the plan on D15. If you choose your start date as D20, which is in the future, the inventory planning engine selects D22, which is the corresponding week start date.

Note: The inventory planning engine may start the plan on a non-working day if you specify the week start date or the period start date to be on a non-working day.

Plan End Date

Forecast bucket and plan bucket granularity

In the inventory plan, the forecast buckets and granularity (defined in the ERP system in the Forecast Entries window) and the planning granularity (defined in the Plan Options window) should be aligned correctly so that the appropriate safety stock requirements are passed on to Oracle Advanced Supply Chain Planning. It is recommended that the start date and the end date for each forecast entry should match the start date and the end date for each planning bucket, respectively.

The plan end date is calculated based on the length of the planning horizon defined by the specified bucket sizes in the Main tab.

You cannot change the start date that appears in the Weeks field. The start date in the Weeks field defaults from the plan start date.

To view the end date for your inventory plan

Steps:

1. Navigate to the Planner Workbench.
2. Choose Plan Options > Main tab.

The Main tab appears showing the end date for your inventory plan.

The Organizations Tabbed Region

The Organizations tabbed region enables you to specify information including the global demand schedule, type of demand variability that applies to the plan, and the forecast scenario.

Organizations Tabbed Region

Plan Options (TST.M1)

Plan: SL90 90% Service Level Plan

Planned Items: Class AA Assignment Set: TST:ASET-IO

Item Simulation Set: Service Level Set:

Main Organizations Constraints

Global Demand Schedules

Name	Description	Type	Ship To Consumption Level	Type of Demand Variability	Probability	Mean Absolute % Error

Organizations

Add All Authorized Orgs

Org	Description	Net WIP	Net Purchases	Net On Hand
TST:M1	TST:Seattle Manufacturing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TST:S1	TST:Chicago Subassembly Plant	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
TST:M2	TST:Boston Manufacturing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Demand Schedules

Scenario Set	Name	Description	Type	Ship To Consumption Level	Type of Demand Variability	Probability	Mean Absolute % Error

The following table describes the fields and options in the Organizations tabbed region:

Field	Description
Global Demand Schedules	Select the names of Oracle Demand Planning scenarios that drive this plan. For more information on global forecasting, see <i>Oracle Advanced Planning Implementation and User's guide</i> .

Field	Description
Type of Demand Variability	<p>Select a demand variability type for the global forecast. Values are:</p> <ul style="list-style-type: none"> Accuracy Metric MAPE or Accuracy Metric MAD: Instructs the Oracle Demand Planning to use demand variability information. This selection changes according to the scenario and the error measure provided by Oracle Demand Planning. Probability: If Oracle Demand Planning demand variability information is not available or you want to run quick variability simulations, select this value, determine a confidence factor for this forecast, and enter it in Probability. Mean Absolute % Error: If Oracle Demand Planning demand variability information is not available or you want to run quick variability simulations, select this value, determine a mean absolute percent error (MAPE) of this forecast, and enter it in Mean Absolute % Error. <p>Note: If you select a value for one forecast in a scenario set, that value applies to all forecasts in that scenario set; you cannot select different variability for the other forecasts in the scenario set.</p>
Mean Absolute % Error	<p>If Type of Demand Variability is Mean Absolute % Error, enter your mean absolute percent error (MAPE) of the global forecast.</p> <p>If you enter a value for one forecast in a scenario set, that value applies to all forecasts in that scenario set; you cannot enter different mean absolute percent errors for the other forecasts in the scenario set. '</p>
Add All Authorized Orgs	When you click, the form retains the organizations that appear in Org and adds all organizations to which you have organization security (according to your responsibility). If one of your authorized organizations is already listed, the form does not add it a second time.
Org	An organization for which this plan is intended.
Description	The name of the organization.
Net WIP	Select to consider discrete jobs and other production orders as supply in the planning demand/supply netting process. Only firm supplies are considered.

Field	Description
Net Purchases	Select to consider purchase orders, purchase requisitions, in-transit shipments and other non production order scheduled receipts as supply in the planning demand/supply netting process. Only firm supplies are considered.
Net On Hand	Select to consider on-hand inventory in the netting process.
Demand Schedules	Select the names of forecasts and Oracle Demand Planning scenarios that drive this plan.
Scenario Set	Enter the identifier for the scenario set with which the forecast is associated. See Setting Demand Variability.
Probability	<p>If Type of Demand Variability is Probability, enter your confidence in the local forecast. For 35% confidence, enter 35.</p> <p>If you enter a value for one forecast in a scenario set, that value applies to all forecasts in that scenario set; you cannot enter different probabilities for the other forecasts in the scenario set.</p>

Using an Existing Plan as a Demand Schedule For a New Plan

The plan for one organization can be used as a demand source (or demand schedule) for the plan of another organization.

Setting Demand Variability

You can specify demand variability as a discrete distribution. Using the Plan Options window, you can specify the probability for a given forecast set. Forecast sets are grouped together in scenario sets by using the scenario set field.

Note: Scenario sets are planned separately.

To set demand variability

Steps:

1. Choose Plan Options > Organizations tab.
2. In the Scenario Set field, enter the scenario set number.

3. In the Name field, enter the demand schedule name (forecast set).
4. In the Probability field, specify corresponding probabilities for forecast sets.

Note: One scenario set includes a list of one or more forecast sets. A forecast set includes a list of one or more forecasts. Use the Probability field to enter an estimate of probability that a particular forecast set within the scenario set will occur. For example, if a scenario set includes three forecasts sets named; Optimistic, Most likely, and Pessimistic, you can enter the probability of the forecasts occurring as 0.15, 0.65, and 0.20, respectively.

Note: The sum of probabilities of forecast sets in a scenario set can be more than 1. If a forecast set probability is not specified, a value of 1 is considered as default.

Note: Safety stock is not calculated if there is no demand and supplier lead time.

Cumulative Demand Distribution

You can specify demand uncertainty in terms of either noncumulative probabilities or cumulative probability distribution. You can view the demand probability in the Supply/Demand window of the Planner Workbench.

Profile option to indicate demand distribution format

The profile option MSR: Probability Distribution Type is used to indicate whether the demand variability is assumed to be in terms of forecast set probabilities or in terms of forecast set cumulative probabilities. The valid options are Probabilities and Cumulative Probabilities. The default value is Probabilities.

This option applies uniformly to all scenario sets. It is not possible to express demand variability in one scenario set in terms of probabilities and in another scenario set in terms of cumulative probabilities. You need to implement a consistent type of demand variability across scenario sets.

Specifying cumulative probabilities

You can specify cumulative probabilities in the Probability field in the Organizations tabbed region (Demand Schedules section).

The maximum value of the cumulative probability, for a given scenario set, needs to equal 1.0. If this is not true, a warning message appears when you attempt to save the plan options. If you run the plan at this point, the plan errors out.

The following tables provide an example of the correct user input:

Scenario Set	Forecast Set	Qty	Prob
1	FSET-A	50	0.4
1	FSET-B	75	0.2
1	FSET-C	100	0.4

Scenario Set	Forecast Set	Qty	Cum. Prob
1	FSET-A	50	0.4
1	FSET-B	75	0.6
1	FSET-C	100	1.0

The following two tables provide examples of incorrect user input:

Scenario Set	Forecast Set	Qty	Cum. Prob.
1	FSET-B	75	0.4
1	FSET-A	50	0.6
1	FSET-C	100	1.0

The cumulative probability cannot go up when the demand quantity comes down. For example, if the cumulative probability is 0.4 for a quantity of 75, the cumulative probability should be less than 0.4 for a quantity of 50. Oracle Inventory Optimization logs the following message during planning and exits if the forecast quantities in the demand distribution do not increase with the cumulative probabilities:

- Error: Forecast quantity does not follow cumulative pattern for scenario set: <scenario_set>, forecast set id: <forecast_set_id>, item_id: <item_id>, org_id: <org_id>, instance_id: <instance_id>, date: <date>

Scenario Set	Forecast Set	Qty	Cum. Prob
1	FSET-A	50	0.4
1	FSET-B	75	0.6
1	FSET-C	100	0.9

In Example 2, the maximum cumulative probability equals 0.9. However, as the maximum value of the cumulative probability needs to equal 1.0, an error message appears. If you run the plan at this point, the plan errors out.

How Probability Data is Used by Oracle Inventory Optimization

The probability information is used in three ways:

- Probability acts like a weight in a normalization calculation.
- Normalized probabilities are used to calculate an expected value for forecast quantities.
- The distribution of the discrete probabilities is used to estimate variance, which is a factor in calculating safety stock quantity.

Safety stock is sized in proportion to the variance of forecast sets probability distributions.

The following table shows how the variance of forecast set probability distribution affects the size of the safety stock.

Forecast Set	Prob. Dist A	Prob. Dist B
FCSTA	0.182	0.100
FCSTB	0.364	0.800
FCSTC	0.454	0.100

All other relevant factors being equal, the safety stock quantity for a situation depicted by probability distribution B would be smaller than safety stock quantity for a situation depicted by probability distribution A because the variance of probability distribution B is less than the variance of probability distribution A.

Weighted Average Calculation

You can enter the probabilities of forecast sets within one scenario set so that they total more than 1. When this occurs, the inventory planning engine normalizes the probabilities so that they sum to 1. In the following table, probabilities of the forecast sets within scenario set 10 are 0.8, 0.4, and 1.0, respectively. Blank values default to 1.0. The sum of the probabilities is 2.2. Dividing the entered probabilities by the sum results in normalized probabilities 0.364, 0.182, and 0.454, respectively. The normalized probabilities sum to one.

Scenario Set	Forecast Set	Probability (entered)	Probability (used)
10	FCST1	0.4	$0.4/2.2 = 0.182$
10	FCST2	0.8	$0.8/2.2 = 0.364$
10	FCST3	(blank)	$1.0/2.2 = 0.454$

How to Assign Forecasts and Forecast Sets to Scenario Sets

The following tables presents the relationships of forecasts, forecast sets, and scenario sets when specifying demand variability.

Forecasts and probability distributions for Item A are displayed in the following table:

Time Period	Quantity	Probability
D1	100	0.80
D1	90	0.07
D1	80	0.13
D2	200	0.80
D2	220	0.07
D2	210	0.13
D3	150	0.60

Time Period	Quantity	Probability
D3	120	0.30
D3	180	0.10
D4	180	0.60
D4	190	0.30
D4	120	0.10

Notice that Item A has the same probability distribution for D1 and D2, and another distribution represents its demand for D3 and D4.

The scenario sets, forecast sets, and forecasts shown in the following tables specify the demand variability for item A:

Item	Quantity	Date
A	100	D1
A	200	D2

Item	Quantity	Date
A	90	D1
A	220	D2

Item	Quantity	Date
A	80	D1
A	210	D2

Item	Quantity	Date
A	150	D3
A	180	D4

Item	Quantity	Date
A	120	D3
A	190	D4

Item	Quantity	Date
A	180	D3
A	120	D4

These forecast sets are tied to their corresponding probabilities and assigned to scenarios sets in the Organization tabbed region as shown in the following table:

Scenario Set	Forecast Set	Probability
10	FCST1	0.80
10	FCST2	0.07
10	FCST3	0.13
20	FCST4	0.60
20	FCST5	0.30
20	FCST6	0.10

If item B has the same probability distribution as item A, you can include item B in the above forecasts and forecast sets. If item B does not follow the same probability distributions, then define separate forecast sets and forecasts for item B. In this case,

item A and B cannot share the same scenario sets either.

Note: If there are multiple forecast sets that have forecasts for the same item, ensure that the bucket size is the same.

Specifying Sources of Demand

Demand Schedules

You can specify a forecast set or a demand planning scenario as input demand for an inventory plan.

To specify sources of demand

Steps:

1. Navigate to the Planner Workbench.
2. Choose Plan Options > Organization tab.
3. Select the demand schedule (Forecast or demand planning scenario) from the list of values.

The Constraints Tabbed Region

You can specify constraints and information regarding the planning horizon in the Constraints tabbed region. Constraint-based planning is an approach for balancing material, budget and plant resources while meeting service levels. It takes into account constraints at the enterprise and plant levels. Material, resources, capacity, or budget constraints are considered. Factory, distribution, and transportation issues are integrated. This complete picture of the problem provides instant and global visibility to the effects of planning and scheduling decisions throughout the supply chain.

Plan Options (TST:M1)

Plan: SL90 90% Service Level Plan

Planned Items: Class AA Assignment Set: TST:ASET-IO

Item Simulation Set: Service Level Set: 999999

Main Organizations Constraints

☒ Enforce Service Level Constraints
 ☐ Enforce Budget Constraints
 ☐ Enforce Capacity Constraints

Plan Level Defaults

Service Level %: 90.00 Supplier Lead Time Variability (%):
 Fulfillment Lead Time: Manufacturing Lead Time Variability (%):
 Budget Name: Intransit Lead Time Variability (%):
 Budget Value:

☐ Enforce User Specified Safety Stocks
 ☒ Enforce Plan Level Defaults
 ☐ Enforce Sourcing Constraints

Planning Horizon

	Weeks	Periods
Start Date	22-MAY-2006	18-JUN-2007
Buckets	52	0
Resource Constraints	No	No
Material Constraints	No	No

This table describes the fields and options in the Constraints tabbed region.

Object	Description
Enforce Service Level Constraints	Select to enforce the service levels specified at the most detailed level. The inventory planning engine exceeds the material, budget, and resource available capacity if needed.
Enforce Budget Constraints	Select this plan option to use a budget amount as a constraint on inventory investment.
Enforce Capacity Constraints	Select if you want material and resource capacity constraints to be respected.
Service Level %	If you select Enforce Service Level Constraints, enter the service level that you want the inventory optimization planning process to use as the service level requirements for all parts in the plan

Object	Description
Fulfillment Lead Time	Fulfillment Lead Time is models the time between taking an order and receipt of goods by the customer.
Budget Name	If you select Enforce Budget Constraints, select the name of the budget that you want the inventory optimization planning process to use as the budget constraint. Alternatively, you can leave this field empty if you want to specify the plan option Budget Value.
Budget Value	If you select Enforce Budget Constraints, enter a value for the inventory optimization planning process to use as the budget constraint. Do not enter this plan option if you select a value for plan option Budget Name.
Supplier Lead Time Variability (%)	<p>This is the plan level default value for supplier lead time variability, in percent.</p> <p>See Setting Plan-Level Lead Time Variability Default Values, page 4-16.</p>
Manufacturing Lead Time Variability (%)	<p>This is the plan level default value for manufacturing lead time variability, in percent.</p> <p>See Setting Plan-Level Lead Time Variability Default Values, page 4-16.</p>
In-transit Lead Time Variability (%)	<p>This is the plan level default value for in-transit lead time variability, in percent.</p> <p>See Setting Plan-Level Lead Time Variability Default Values, page 4-16.</p>
Enforce User Specified Safety Stocks	Select this plan option to enforce any safety stock levels that you define as a constraint on inventory stocking levels.
Enforce Plan Level Defaults	<p>Select this check box to force the system to use only the plan level default values and ignore any other settings of service levels and fulfillment times.</p> <p>See Setting Plan-Level Default Values, page 4-2.</p>
Enforce Sourcing Constraints	Select if you want to enforce the sourcing splits in the item sourcing rules. The inventory planning engine violates sourcing constraints if enforcing them puts the plan constraint (service level, budget, or capacity) at risk.

Object	Description
Start Date	Displays the start date for each bucket type.
Buckets	Displays the number of buckets of this bucket type.
Resource Constraints	Select Yes to consider resource constraints.
Material Constraints	Select Yes to consider material constraints.

Constraint Options

You can select one of the following three constraint options:

- **Enforce Service Level Constraints**
This option enforces the service level specified at the most detailed level. In a simple example, if the plan level (global) service level is set to 95% and the service level for item AS12345 is set to 98%, the 98% service level is enforced for item AS12345 and the 95% service level is enforced for all other items of the inventory plan. Material and production resources along with budgets are utilized beyond availability if necessary to attain the desired service levels.
- **Enforce Capacity Constraints**
This option enforces material and resource capacity constraints throughout the plan. The inventory planning engine calculates the service levels achieved and budgets required based on the amount of available material and production capacity.
- **Enforce Budget Constraints**
This option enforces a budget amount as a constraint on inventory investment. You can create budgets and specify one for each plan run. You can specify a value for a budget at the plan level. Oracle Inventory Optimization calculates the service levels achieved based on the amount of the available budget. The inventory planning engine calculates the material and production resource requirements based on the supply created after considering budget constraints.

For more information, see *Oracle Advanced Planning Implementation and User's Guide*.

Plan Level Defaults

To facilitate simulations, you can enter plan level overrides of key Inventory Optimization planning parameters in the Plan Options window:

- Service level
- Fulfillment lead time
- Budget value
- Lead time variation
 - Manufacturing variability (%)
 - In-transit lead time variability (%)
 - Supplier lead time variability (%)

Note: These values supersede all values specified at more granular levels when the Enforce Plan Level Defaults check box is selected.

See:

- Setting Plan Level Default Service Level, page 4-2
- Defining Budgets, page 4-12
- Setting Default Lead Time Variability, page 4-16

Service Level and Fulfillment Lead Time

The definition of *Service Level* used here is the percent of order lines received that can be filled immediately and completely from stock. It is assumed that orders can be forecast, but advance notice of orders is not typically provided by customers. Therefore safety stock is sized to buffer uncertainty of demand quantity and time.

The *Demand Fulfillment Lead Time* models the situation where the customer provides advance notice to fulfill demand. The Demand Fulfillment Lead time spans all activities between taking an order and receipt of goods by the customer. Modeling Demand Fulfillment Lead Time is useful for evaluating the cost of different fulfillment time promises and their impact on inventory. For example, comparing inventory investment requirements for a 95% service level with a promised five-day order fulfillment time versus a 90% service level with a three-day fulfillment time.

Modeling fulfillment time also allows you to evaluate the impact of changes in fulfillment time on the degree and point of postponement. *Postponement* refers to delaying commitment of material to a specific end use. This concept is sometimes called *delayed differentiation*.

Inventory stored in raw material form generally has greater flexibility with respect to how it is eventually used by the consumer. However raw material takes longer to convert to the usable form than it would if in anticipation of receiving sales orders the

material has been partially transformed and stored as modular subassemblies. Inventory stored as finished goods can fulfill customer demand immediately, but has no flexibility with respect to end use. In between raw material form and finished goods form are various degrees of completion, each with an associated lead time for transformation to end use. The trade-off is between shorter demand fulfillment lead time and postponing differentiation of material to retain end use flexibility. The longer your fulfillment time, the greater the opportunity to postpone. Postponement tends to lower your inventory carrying costs because the material that you do carry is stored in a form that can be used to fulfill demand for a variety of end items.

See Analyzing Postponement, page 6-14.

The key setup steps are:

1. Define default values for target service levels and fulfillment lead times in the Plan Options form.

These values are used for those items for which target service levels or fulfillment lead times are not specified..

2. Setup specific values for target service levels and fulfillment lead times for specific items, categories of items, customers, demand classes, and so on, by defining a Service Level Set.

See Defining Service Agreement Simulation Sets, page 4-4.

3. Associate a defined Service Level Set with a plan when setting up the plan options. See Setting Up Plan Options, page 3-2.

When the plan is run, the system tries to meet the specific target service levels and fulfillment lead times assigned in the service level set.

The process is then executed as follows:

1. Run the Inventory Optimization module with service levels and fulfillment lead times setup as described.
2. Review the results of the plan – check the inventory, safety stock and service levels.
3. If the results are satisfactory, use this plan as a demand schedule in tactical planning, using Oracle Advanced Supply Chain Planner.
4. If the results are unsatisfactory you change your goals (service levels) or constraints (budgets, minimum or maximum inventory levels) to achieve your desired results.
5. Return to step 1 (rerun the plan).

Lead Time Variability

By modeling different sources of variability, it is possible to understand the

contribution to buffer inventory from each source of variability. These uncertainties in production, transportation, and procurement are expressed as a percent variance for manufacturing lead time, in-transit lead time, and supplier lead time.

The key setup steps are:

1. Set up manufacturing lead time, in-transit lead time, and supplier lead time percent default values on the Constraints tab of the Plan Options form.
2. If you want to set up lead time variability at more detailed levels, see:
 - Setting Up Manufacturing Lead Time Variability, page 4-17
 - Setting Up In-Transit Lead Time Variability, page 4-18
 - Setting Up Supplier Lead Time Variability, page 4-19

After setting up manufacturing, in-transit, and supplier lead variance percent, the process is then executed as follows:

1. Run the Inventory Optimization module with the lead time variability setup as described.
2. Review the results of the plan – check the inventory, safety stock and service levels.
3. If the results are satisfactory, use this plan as a demand schedule in tactical planning, using Oracle Advanced Supply Chain Planner.
4. If the results are unsatisfactory you change your goals (variability percentages) or constraints (budgets, minimum or maximum inventory levels) to achieve your desired results.
5. Return to step 1 (rerun the plan).

Inventory Budget

An Inventory budget is the maximum amount allocated to be spent on inventory during a planning period, and it represents the total value of the inventory. The inventory budget applies to both safety stocks and prebuilt stocks. It also applies to the surplus inventory that gets carried over from one planning bucket to the next.

You can specify budget for the following:

- Inventory plan
- Organizations in an inventory plan
- Categories in an organization

As the feasibility of an inventory plan depends on its budget, you need to take your budget into consideration in your inventory plan. After you define the budget, you can run your plans and analyze them by using the Analysis Workbench to:

- Ensure that your inventory plans are well within your budget.
- Determine if a specific service level is achievable with the given budget.
- Calculate the budget required to achieve a specific service level.

You can then drill down to the items causing budget violations using the Planner Workbench. For information on the Analysis Workbench, see *Overview of Analysis Workbench*, page 6-1. For information on the Planner Workbench, see *Oracle Advanced Planning Implementation and User's Guide*.

- Drill down to the items causing budget violations.

You can also allocate the budget to specific items, customers, market segments, and business units. You can also exclude some of the planned items from the budget. For example, you may want to exclude the items that are managed by your suppliers.

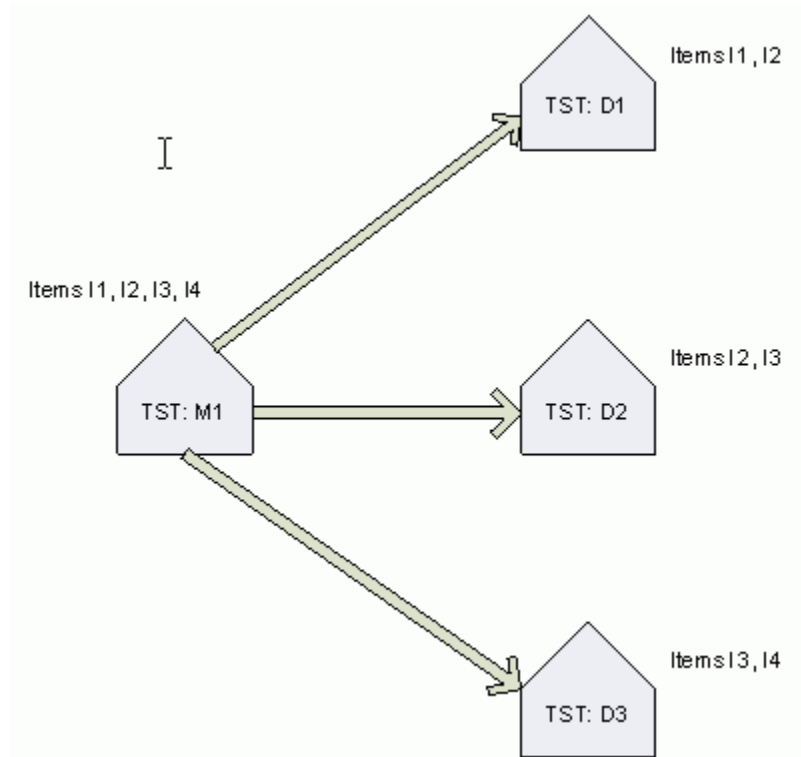
See *Defining Budgets*, page 4-12 and *Analyzing Inventory Budgets*, page 6-25.

Budget Constraints Logic

Oracle Inventory Optimization provides an enhanced logic for budget constraints. The enhanced logic ensures Inventory Optimization outputs integer safety stocks in the presence of a budget constraint and also ensures the deviation from the input budget constraint is minimal. For intermittent low volume demands the current logic was unable to provide an integer valued solution within the input budget constraint.

The logic for budget constraints is demonstrated in the following example.

The supply chain is as shown below.



The order of profitability is:

- For Items: $I1 > I2 > I3 > I4$
- For Organizations: $D1 > D2 > D3$

The target safety stock quantities are 1 unit for all Item-Organizations.

The standard cost is \$1 for all Items at all the Organizations

The sorted list of order of profitability for the Item-Organizations is:

- I1 at TST:D1
- I2 at TST:D1
- I2 at TST:D2
- I3 at TST:D2
- I3 at TST:D3
- I4 at TST:D3

Example 1: Plan Level Budget = \$8

Based on the above sort order, I1 at TST:D1 and I2 at TST:D1 get \$2 while all other

item-organizations get \$1.

Example 2: Plan Level Budget = \$4

Given the sort order, I3 at TST:D3 and I4 at TST:D4 do not get any allocation while all other item-organizations get \$1.

Example 3: Budget specified at Organization Level. TST:D1 = \$5; TST:D2 = \$1

At organization TST:D1, I1 will get \$3 and I2 will get \$2

At organization TST:D2, I2 will get \$1 and I3 will get nothing

Example 4: Plan Level Budget = \$3; User Specified SS for Item I3 at TST:D3 is 3 units

Allocate \$1 to I1 at TST:D1, I2 at TST:D1, and I2 at TST:D2

Allocate \$3 to I3 at TST:D3

All other Item-Organization get zero allocation

Key Setups

This chapter describes the key setups such as the target service levels and performance indicators that you need to specify before you run your inventory plan.

This chapter covers the following topics:

- Setting Plan Level Default Service Level
- Setting Plan Level Default Demand Fulfillment Lead Time
- Service Level Set
- Defining Service Level Sets
- Item Simulation Set
- Defining Item Attribute Simulation Sets
- Defining User-specified Safety Stock
- Defining Budgets
- Enforcing a Plan Option Budget Name or Value
- Setting Default Lead Time Variability
- Setting Up Manufacturing Lead Time Variability for a Plan
- Setting Up Manufacturing Lead Time Variability for an Item
- Setting Up In-Transit Lead Time Variability
- Setting Up Supplier Lead Time Variability
- Setting Penalty Costs
- Setting Item Purchase Price by Supplier
- Setting Performance Indicators
- Setting Intermittent Demand

Setting Plan Level Default Service Level

Target service level is the percentage of demand that you plan to satisfy using your available inventory. The inventory planning engine uses the specified target service level to make recommendations such as target safety stock.

You can enforce target service levels to make sure that the plan meets the target service levels. To meet the enforced target service levels, the plan may violate budget or capacity constraints.

You can define the plan service level in the Service Level % field in the Constraints tabbed region of the Plan Options window.

Steps:

1. From the Inventory Planner responsibility, navigate to the Plan Options window.
Inventory Plan > Options
2. Click the Constraints tab.
3. In the Plan Level Defaults region, set the default target Service Level for the plan.
4. (Optional) To ensure that these default values override any other specification or setting that may occur at a more detailed level, select the Enforce Plan Level Defaults check box.

Note: If the Enforce Plan Level Defaults' is unchecked, the most specific assignment of Service Levels in the Service Level Set associated with the plan is used for planning. If no value has been assigned in the associated Service Level Set, then the plan level default values, if set, are used. If the plan level default values are not set, then the system assumes a target service level of 50%.

See Defining Service Agreement Simulation Sets, page 4-4.

5. Save your work.

Setting Plan Level Default Demand Fulfillment Lead Time

You can define the demand fulfillment service level in the Constraints tabbed region of the Plan Options window.

Steps:

1. From the Inventory Planner responsibility, navigate to the Plan Options window.

Inventory Plan > Options

2. Click the Constraints tab.
3. In the Plan Level Defaults region, set the default Demand Fulfillment Lead Time for the plan.
4. (Optional) To ensure that these default values override any other specification or setting that may occur at a more detailed level, select the Enforce Plan Level Defaults check box.

Note: If the Enforce Plan Level Defaults' is unchecked, the most specific assignment of Fulfillment Lead Time in the Service Level Set associated with the plan is used for planning. If no value has been assigned in the associated Service Level Set, then the plan level default values, if set, are used. If the plan level default values are not set, then the system assumes a fulfillment lead time of zero days.

See Defining Service Agreement Simulation Sets, page 4-4.

5. Save your work.

Service Level Set

Specific service level targets can be assigned to items, categories of items, customers, classes of demand, an organization or combinations of these. These are defined in a form titled Service Levels and Fulfillment Lead Time. This form serves as a central place to set service levels for items, categories, organizations, customers, and so on. It makes obsolete several ways that service levels could be set prior to Release 12.0, such as a flex field in Oracle Inventory, and the Allocations form.

When an item has target service levels assigned at different levels of specificity, the more specific setting overrides the less specific one. The various levels of assignment allowed in a Service Level Set are listed below in *increasing* order of specificity.

Example

For example, Item-Demand Class is more specific than Customer Site. In the case where the scope of target service level overlaps Customer Site and Item-Demand Class, the settings for Item-Demand Class would be in effect.

1. Instance-Organization
2. Customer
3. Customer Site

4. Demand Class
5. Instance-Organization-Demand Class
6. Category
7. Category Demand Class
8. Item-Demand Class
9. Item-Instance-Organization
10. Item-Instance-Organization-Demand Class

See Defining Service Agreement Simulation Sets, page 4-4.

Defining Service Level Sets

A service level set needs to be associated with a plan to ensure that specific assignments of target service levels and fulfillment lead times are respected in the planning process. The Service Level Set is associated with a plan by clicking the constraints tab of the Plan Options folder, and then selecting the appropriate Service Level Set from the list of values to use with the plan.

Assignment Level	Category	Demand Class	Item	Customer	Customer site	Service level(%)	Fulfillment Lead Time
Item-Instance-Organization...		CENTRAL	AS65103			97.00	3.00
Item-Instance-Organization			AS65311			95.00	1.00
Item-Demand Class		CENTRAL	AS65102			90.00	2.00
Instance-Organization-De...		CENTRAL				85.00	1.00
Demand Class		EAST				80.00	2.00
Customer Site				ABC Telecomm	1021 Fifth Avenue,...	75.00	3.00
Customer				Knowledge Pa		70.00	2.00
Instance-Organization						69.00	1

Specific service level targets can be assigned to items, categories of items, customers, classes of demand, an organization or certain allowed combinations. These are done by choosing the appropriate assignment level, and then specifying the desired target service level and fulfillment lead time.

To set up a Service Level Set, use this procedure:

Prerequisites

- ☐ As part of the setup it is necessary to specify the value of the profile option **MSC: Service Level Category Set**. Only categories from this category set are available when assigning target service levels and fulfillment lead times at a category level during the setup of specific item or category level service levels and fulfillment lead times.

Steps:

To set up a Service Level Set

1. From the Inventory Planner responsibility, navigate to the Service Levels and Fulfillment Lead Time window.

Inventory Planner > Setup > Service Levels & Fullment Lead Time
2. Define a Service Level Set name and description.
3. (Optional) Select the 'Set as display default' check box to indicate that this Service Level Set should appear as the default value in the header region of the Plan Options window.
4. In a row under the Assignment Level column, select an Assignment Level from the list of values.
5. For that same row, specify the applicable details, such as: Category, Demand Class, Item, Customer, and Customer site, to apply to the selected Assignment Level.

Note: The fields in the Assignment Level row in which you can add details varies, depending on the Assignment Level you selected.

6. For that same row, in the Service Level (%) column, specify the target service level, in percent, for the Assignment Level.
7. For that same row, in the Fulfillment Lead Time column, specify the Demand Fulfillment Lead Time, in days. See Demand Fulfillment Lead Time, page 3-23.
8. Repeat steps 4 - 7 for each additional Assignment Level in the Service Level Set.
9. Save your work.

To associate a Service Level Set with a Named Plan

10. Navigate to the Inventory Plan Options window:

Inventory Planner > Inventory Plan > Names

The Organizations window appears.

11. Select an organization and click OK.

The Inventory Plan Names window appears.

12. Select a plan and then click Plan Options

The Plan Options window appears.

13. Select the Constraints Tab.

The Service Level Set field located in the header region is enabled.

14. From the Service Level Set list of values, select a Service Level Set.

15. Save your work.

Item Simulation Set

Item Attribute Simulation Sets enable Inventory Optimization plans to more easily simulate changes to key item attributes. You to attach values of key attributes to item-organizations or to item-regions, and then save those assignments under an Item Attribute Simulation Set name.

Item Simulation Sets provide the ability to mass maintain planning-related item attributes. Planners can create multiple item simulation sets, with each simulation set addressing a set of "what-if" scenarios.

The Item Simulation Set field appears in the header region of the Plan Options window. When you specify a particular item attribute simulation set name in the Item Simulation Set field of the Plan Options window, the plan uses the item attribute values specified in the named simulation set.

Key setup steps are:

1. Identify the scenario to be simulated.
2. Determine the scope of the simulation.
3. Create a Query to identify Items that fit the scope.
See Queries, page 5-2.
4. Identify attributes that need to be modified to meet the simulation objective.
5. Modify the attributes according to the scenario to be simulated.
6. Save the attributes as a named Item Simulation Set.

7. Link the Item Simulation Set to a plan in the header region of the Plan Options form.
 - The simulation set holds only the changes for the collected planning item attributes.
 - When running a plan these changes overwrite the collected data values for that specific plan.
 - Collected data remains unaltered.
 - If there is no simulation set linked with a plan, the plan runs against the collected data.

See Defining Item Attribute Simulation Sets, page 4-7.

Defining Item Attribute Simulation Sets

Steps:

1. From the Advanced Supply Chain Planner responsibility, navigate to the Item Attributes Mass Maintenance window.
Setup > Item Attributes Mass Maintenance
The Item Attributes Mass Maintenance window appears.
2. Define the Simulation Set Name and Description.
3. Find relevant items.

Example

Example, using the Find Items - 'Included' radio button:

- Item A:
 - Make/Buy: Make
 - Planner: J. Smith
 - Processing LT: 3 days
 - Item A was previously updated.
- Item B:
 - Make/Buy: Buy

- Planner: J. Smith
- Processing LT: 2 days
- Item C:
 - Make/Buy: Buy
 - Planner: J. Smith
 - Processing LT: 3 days
 - Item C was previously updated.
- Query criteria:
 - Make/Buy: Buy
 - Planner: J. Smith
 - The 'Included' radio button is selected
 - Result: the query results return Item C only.

Note: Item B does not qualify since it has not been updated in this simulation set, and Item A does not qualify since it does not meet the query criteria

- Use the 'Not included' radio button when finding those items that have not been updated as part of the simulation set. This is useful for adding new items to the simulation set. The results of the query filters out the items that have been updated in this simulation set.

Continuing the previous example, if the query is used in conjunction with the 'Not included' radio button, query results return Item B only.

Note: Item C does not qualify since it has been updated in this simulation set, and Item A does not qualify since it does not meet the query criteria.

- Use the 'All' radio button for finding all items regardless of update status. This is useful in situations where a new simulation scenario is being developed and is applicable to all items.

Continuing the previous example, if the query is used in conjunction with the 'All' radio button, query results return Item B and Item C.

Note: Item A does not qualify since it does not meet the query criteria

The screenshot shows the 'Item Attributes Mass Maintenance' window. At the top, 'Item Simulation Set Name' is 'Increase LT' and 'Description' is 'Increase LT by 20% for Buy Items'. Below this, the 'Find Items' section has radio buttons for 'Included', 'Not Included', and 'All' (selected), with a 'Find' button. A 'Select All' checkbox is also present. The main table has columns: 'Select', 'Item', 'Org', 'Original Critic', 'Critical Componen', 'Original Proce', 'Processing Le', and 'Original Preproce'. A 'Find Items' sub-dialog is open, displaying a table with columns: 'Criteria', 'Condition', 'From', and 'To'. The table contains three rows: 'Original Make or Buy' with 'Equals' and 'Buy'; 'Original Planner' with 'Equals' and 'J. Smith'; and 'Organization' with 'Equals' and 'TST.M1'. The 'Find' button in the sub-dialog is highlighted. At the bottom of the main window are 'Cancel' and 'Apply' buttons.

Criteria	Condition	From	To
Original Make or Buy	Equals	Buy	
Original Planner	Equals	J. Smith	
Organization	Equals	TST.M1	

4. Define the simulation set. Select the check boxes associated with relevant items.

Item Simulation Set Name: Increase LT

Description: Increase LT by 20% for Buy Items

Find Items: ☐ Included ☐ Not Included ☒ All

☒ Select All

Select	Item	Org	Original Critical	Critical Component	Original Process	Processing Lead	Original Preparation	F
<input checked="" type="checkbox"/>	CL03755	TST:M1	No				2	
<input checked="" type="checkbox"/>	CL12345	TST:M1	No				2	
<input checked="" type="checkbox"/>	CL12346	TST:M1	No				2	
<input checked="" type="checkbox"/>	CL12347	TST:M1	No				2	
<input checked="" type="checkbox"/>	CL12348	TST:M1	No				2	
<input checked="" type="checkbox"/>	CM08830	TST:M1	No		5			
<input checked="" type="checkbox"/>	CM10450	TST:M1	No				2	

Attribute Name: Condition: Attribute Value:

5. Modify attributes. The available conditions that can be used to update the Attributes are as follows:
 - Set value to: set the attribute to a specified value
 - Increase by value: increase the original attribute by a specified value
 - Increase by percentage: Increase the original attribute by a specified percentage (%)
 - Decrease by value: Decrease the original attribute by a specified value
 - Decrease by percentage: Decrease the original attribute by a specified percentage (%)
 - Set original value: Reset the attribute back to the original collected value

Item Attributes Mass Maintenance

Item Simulation Set Name: Increase LT Description: Increase LT by 20% for Buy Items

Find Items: ☐ Included ☐ Not Included ☒ All Find

Select All ☒

Select	Item	Org	Original Critic	Critical Compon	Original Proce	Processing Le	Original Preproce
<input checked="" type="checkbox"/>	CL03755	TST:M1	No				2
<input checked="" type="checkbox"/>	CL12345	TST:M1	No				2
<input checked="" type="checkbox"/>	CL12346	TST:M1	No				2
<input checked="" type="checkbox"/>	CL12347	TST:M1	No				2
<input checked="" type="checkbox"/>	CL12348	TST:M1	No				2
<input checked="" type="checkbox"/>	CM08830	TST:M1	No		5		2
<input checked="" type="checkbox"/>	CM10450	TST:M1	No				2

Delete

Attribute Name	Condition	Attribute Value
Processing LT	Increase by percentage	20

Cancel Apply

6. Repeat the preceding step for all attributes to be modified. Click Apply. The form updates to show the original and modified values.

Item Attributes Mass Maintenance

Item Simulation Set Name: Increase LT Description: Increase LT by 20% for Buy Items

Find Items: ☐ Included ☐ Not Included ☒ All Find

Select All ☐

Select	Item	Org	Original Critic	Critical Compon	Original Proce	Processing Le	Original Preproce
<input type="checkbox"/>	CM13139	TST:M1	No		3	3.6	
<input type="checkbox"/>	CM13375	TST:M1	No		2	2.4	
<input type="checkbox"/>	CM15138	TST:M1	No		5	6	
<input type="checkbox"/>	CM15140	TST:M1	No		5	6	
<input type="checkbox"/>	CM16374	TST:M1	No		2	2.4	
<input type="checkbox"/>	CM18759	TST:M1	No		3	3.6	
<input type="checkbox"/>	CM18761	TST:M1	No		2	2.4	

Delete

Attribute Name	Condition	Attribute Value
	Set Value To	

Cancel Apply

Note: The original set of values refer to the collected data, and hence cannot be updated.

7. Specify the simulation set in the Item Simulation Set field of the Plan Options window.

See Setting Up Plan Options, page 3-2.

Note: If the Item Simulation Set field is left blank, then collected data will be used for planning.

Defining User-specified Safety Stock

Several factors may influence your decision related to the level of safety stock that you need to maintain. These include:

- Contractual obligations
- Vendor-managed inventory
- Policies regarding service levels
- Subjective experience

The inventory planning engine recommends optimal safety stock levels. However, you can override the recommendations that the inventory planning engine generates with your specific inputs. For more information, see User-Specified Safety Stock, page 7-5.

Defining Budgets

To define an inventory budget

Prerequisites

- ☐ To define a budget, you need to set up a category set for budget purposes and associate categories to this category set. Both these tasks are done in Oracle Inventory. For more information on categories and category sets, see Oracle Inventory User's Guide.

Steps:

1. Log on to Oracle Inventory Optimization.
2. From the Navigator, choose Other > Profile.
 - The Personal Profile Values window appears.

Personal Profile Values window

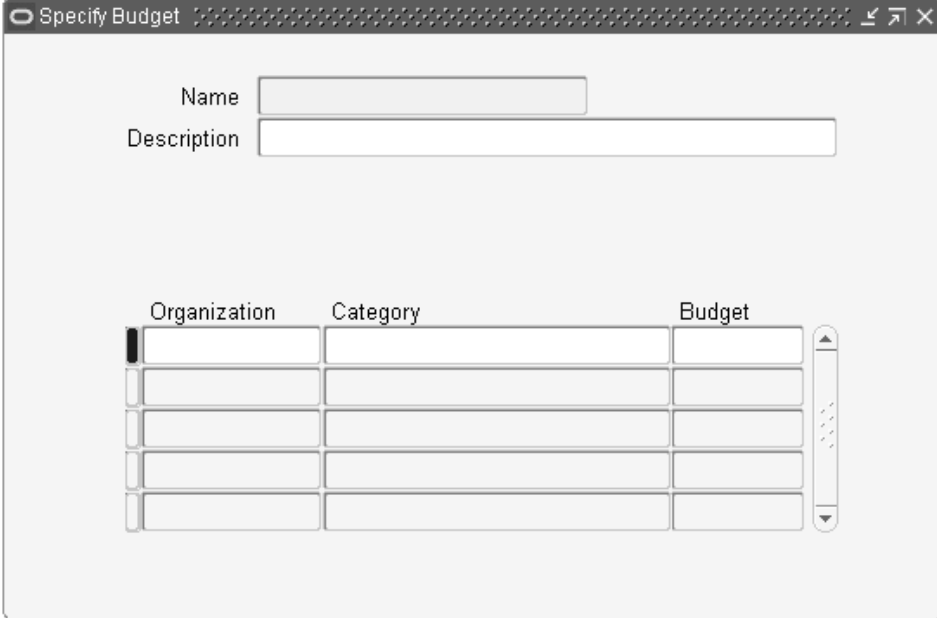
Profile Name	Default Value	User Value

3. Use the information in the following table to complete the fields in the Personal Profile Values window.

Field	Description
Profile Name	Select the "MSR:Budget Category Set" profile name from the LOV.
User Value	Select the category set from the LOV to which the planned items belong.

4. Save your work.
5. To define the budget at the organization or category level, choose Setup > Specify Budgets.
 - The Specify Budget window appears.

Specify Budget window

A screenshot of the 'Specify Budget' window. The window has a title bar with the text 'Specify Budget' and standard window controls. Inside, there are two text input fields: 'Name' and 'Description'. Below these is a table with three columns: 'Organization', 'Category', and 'Budget'. The table has five rows, each with empty input fields. A vertical scrollbar is on the right side of the table.

6. Use the information in the following table to complete the fields in the Specify Budget window.

Field	Description
Name	Specify a name for the budget.
Description	Specify a description for the budget.
Organization	Select the organizations from the LOV for which you want to define the budget.
Category	Select the categories from the LOV for which you want to define the budget.
Budget	Specify the value for the budget.

7. To define the budget at the plan level, navigate to the Constraints tabbed region of the Plan Options window. For more information, see The Constraints Tabbed Region, page 3-19.

Note: To exclude an item from your budget, clear the Exclude From Budget check box in the MPS/MRP Planning tabbed region of the Master Item window in Oracle Inventory. For more information, see *Oracle Inventory User's Guide*.

Enforcing a Plan Option Budget Name or Value

Select Enforce Budget Constraints on the Plan Options window if you want the plan to be constrained by a budget. To Enforce Budget Constraints, select the name of the budget that you want the inventory optimization planning process to use as the budget constraint.

Alternatively, you can leave this field empty if you want to specify the plan option Budget Value. Enter a value for the inventory optimization planning process to use as the budget constraint. Do not enter a Budget Value if you select a value for the plan option Budget Name.

If you enforce the budget that you have defined, the inventory planning engine makes sure that the inventory plan adheres to the budget at all levels. Consider that you plan for two organizations where \$75,000 is the total budget for the plan, and \$50,000 and \$30,000 are the budgets for the first and second organizations respectively. If you enforce this budget in your plan, the inventory planning engine recommends an inventory of only up to \$50,000 and \$30,000 for the first and second organizations respectively. At the plan level, it recommends an inventory of only up to \$75,000. If the plan level budget exceeds \$75,000, then the engine optimizes the recommended inventory at the organization level so that the combined budget of the two organizations does not exceed \$75,000.

Enforcing service level constraints or capacity constraints may violate budget constraints. Conversely, enforcing budget constraints may violate service level constraints and capacity constraints. You can enforce budget constraints at the plan level by specifying the budget name or the budget value in the Plan Options window. For information on enforcing constraints for a plan, see The Constraints Tabbed Region, page 3-19. The inventory planning engine reports any violations as exceptions. For information on plan exception messages, see Reviewing Exception Messages, page 5-16.

Usually, target safety stock and user-defined safety stock are enforced when there is adequate budget. The inventory planning engine's built-in logic makes sure that the budget is allocated accordingly to meet the enforced service levels for all items. The inventory planning engine allocates any surplus budget based on the following criteria:

- Potential profitability
- Service levels

- Demand distribution

Note: If you enforce target safety stock or user-defined safety stock, it is assumed that you have specified an adequate budget. If the budget is not adequate, the engine violates the budget constraints even if you have enforced budget constraints.

The following example details how the inventory planning engine allocates the budget surplus.

Example

Consider a plan for three items with a total budget of \$10,000. Assume that you have specified a target service level of 85% for all three items. The inventory planning engine calculates the safety stock levels required to achieve a service level of 85% for the three items. Assume that the budget required for a service level of 85% for the three items is \$7000. The inventory planning engine distributes the surplus \$3000 proportionately for the three items based on their potential profitability and demand distribution. As a result, the actual service level for the three items may differ from one another even though you have specified a consistent service level of 85% for all the three items.

Setting Default Lead Time Variability

Plan-wide default values for manufacturing, in-transit, and supplier lead time variability are specified in the constraints tab of the Plan Options form. The values specified here are used as defaults in the case where users have not specified the value of the variability for specific items. Optionally a user can check the Enforce Plan Level Defaults check box to ensure that these defaults override any other detailed specification or setting.

Steps:

1. Plan-wide default values for lead time variability are specified in the constraints tab of the Plan Options form. From the Inventory Planner responsibility, navigate to the Plan Options window.

Inventory Plan > Names

The Inventory Names window appears.
2. Click the Constraints tab.
3. In the Plan Level Defaults region, set the default lead time variability percentages for the plan.
4. (Optional) To ensure that these default values override any other specification or setting that may occur at a more detailed level, select the Enforce Plan Level Defaults check box.

5. Save your work.

Setting Up Manufacturing Lead Time Variability for a Plan

Manufacturing lead time variability for a plan is set in the Items window accessed from the Collections Workbench.

Steps:

1. From the Inventory Planner responsibility, navigate to Inventory Planner > Collections > View Collected Data.
The Navigator window opens.
2. On the Plans tab of the Navigator, select View by Organization.
3. In the Navigation window, drill down to Plan Name: : Plans>Collection>Plan Name.
4. Drill down to the item for which you want to set manufacturing lead time variability.
5. Access the Items form: Right click the item and then choose Items from the menu.
6. Click the Item field and then select the item for which you want to set the manufacturing lead time variability from the menu.
7. Set the manufacturing lead time variability, in percent.
8. Save your work.

Setting Up Manufacturing Lead Time Variability for an Item

Manufacturing lead time variability for an item is set in the Item Attributes Mass Maintenance window, which is accessed from the Workbench.

Steps:

1. From the Inventory Planner responsibility, navigate to Inventory Planner>Setup>Item Attributes Mass Maintenance.
The Item Attributes Mass Maintenance window opens.
2. In the Item Simulation Set window, enter the name of the Item Simulation Set.
3. Click the Item field and select the item from the drop-down menu and click OK. If necessary, enter a partial name in the Find field to locate the item and then click

OK.

4. Click the Org field and select the organization that contains the item from the drop-down menu and click OK. If necessary, enter a partial name in the Find field to locate the organization and then click OK.
5. Click the Select checkbox to the left of the Item and Org.
6. In the Item attributes available for update section at the bottom of the window, click the Attribute Name field.

The Item Attributes window opens.

7. In Item Attributes window, select Manufacturing LT Variability and click OK.
8. Click the Condition field.

A window opens with a list of all the possible conditions.

9. Select the desired condition.
10. Click the Attribute Value field and enter the desired value.
11. Click Apply.
12. Save your work.

Setting Up In-Transit Lead Time Variability

In-transit lead time variability is setup in the transit times form accessed from the navigator. In addition to specifying the in-transit time, you can specify the variability of the transit time. This variability is expressed as a percent (%) variance for each ship method between a source and a destination organization.

Note: This form should be accessed only in the planning instance and not from the source (ERP) instance. The same form in the source instance does not allow setting of in-transit lead time variability.

Steps:

1. From the Inventory Planner responsibility, navigate to the Transit Times window.

Inventory Planner > Setup > Transit Times

The Transit Times window appears.

The screenshot shows the 'Transit Times' window with the following sections:

- Organization:** A text field and a 'Find' button.
- Scope:** A dropdown menu set to 'From or To Organization'.
- Shipping Networks:** A table with two columns: 'From Org' and 'Location'. It contains four rows:

From Org	Location
TST.OE5	GBL OE5 Proj Location
TST.OE5	GBL OE5 Proj Location
TST.BP5	GBL BP5 Proj Location
TST.XC1	X-PELLA-IOWA
- Ship Methods:** A table with columns: 'Shipping Method', 'Default Method', 'Transit Time', 'Intransit Lead Time Variability', 'Mode of Transport', 'Maximum Trip Weight', 'Maximum Trip Weight UOM', 'Maximum Trip Volume', 'Maximum Trip Volume UOM', and 'Daily Capac'. The first row is selected:

Shipping Method	Default Method	Transit Time	Intransit Lead Time Variability	Mode of Transport	Maximum Trip Weight	Maximum Trip Weight UOM	Maximum Trip Volume	Maximum Trip Volume UOM	Daily Capac
UPS	<input checked="" type="checkbox"/>	1							
	<input type="checkbox"/>								
	<input type="checkbox"/>								
	<input type="checkbox"/>								

Buttons at the bottom: 'Assignment Set' and 'Ship Methods Lookup'.

- In the Shipping Networks region, select the row for the from - to organization combination for which you want to specify in-transit lead time variability.
- The Ship Methods region populates with established shipment methods between the source and destination organizations.
- In the Ship Methods region, set up the Transit Time and the In-transit Lead Time Variability as a percentage of the Transit Time.
 - Save your work.

Setting Up Supplier Lead Time Variability

Supplier lead time variability represents the uncertainty in the availability of supplies. You need to set this up for the inventory planning engine to factor in this uncertainty when it calculates the safety stock levels.

You can specify supplier lead time variability either at the item-supplier level or at the supplier level. The inventory planning engine uses the information specified at the supplier level if you have not specified it at the item-supplier level.

Supplier lead time variability is set in the Suppliers window accessed from the Collections Workbench. Supplier variability can be specified either as a discrete distribution or as a percent (%) variance for a normal distribution.

Note: You can specify supplier lead time variability information only in the planning server.

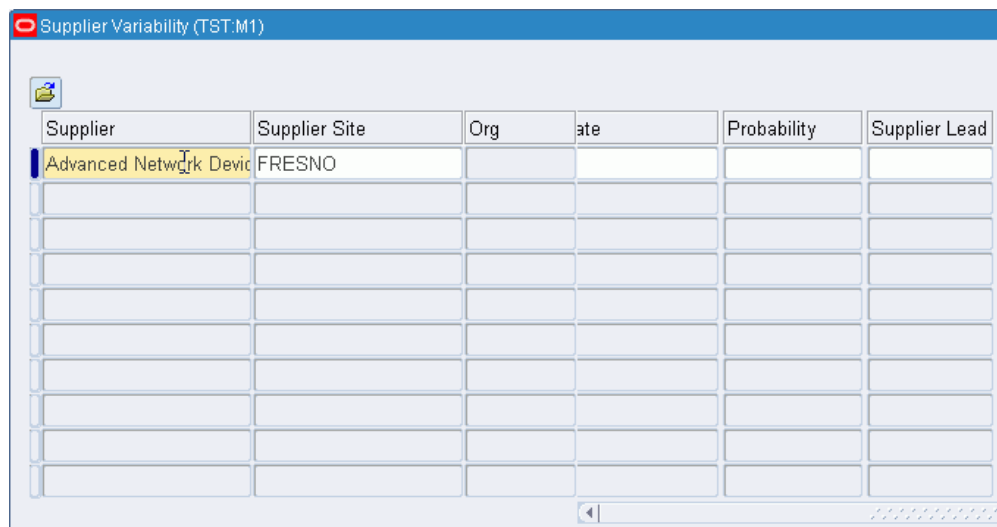
To set supplier lead time variability

Steps:

1. From the Inventory Planner responsibility, navigate to the Collections Workbench.
Inventory Planner > Collections > View Collected Data
The Navigator window opens.
2. On the Plans tab of the Navigator, select: View by Items.
3. Drill down to the item for which supplier lead time variability has to be associated.

Note: To assign supplier variability independent of a specific item, select the supplier in the Navigator. If an item does not have supplier-specific variability, the inventory planning engine defaults to the supplier level.

4. Right click the supplier and select Supplier Variability from the drop-down menu.
The Supplier Variability window appears.



Supplier	Supplier Site	Org	Date	Probability	Supplier Lead
Advanced Network Device	FRESNO				

5. Specify either the normal distribution Supplier Lead Time Variability percent, or use the Dates Late and Probability columns to define a discrete probability distribution representing supplier lead time variability.

Note: Supplier variability prior to Release 12.0 was modeled as a set of discrete probabilities. In the Dates Late and Probability columns, users set up the number of days that the supplier was

expected to be late, along with an associated discrete probability for the occurrence. With Release 12.0, the user can specify a percent (%) variance in the Supplier Lead Time Variability column. Users can specify variance using one or the other methods, but not both.

Fields	Description
Supplier	Supplier name
Supplier Site	Supplier site name
Org	Organization
Days Late	The number of days by which the item has been delivered late. You can enter only whole numbers. You can enter a negative whole number to indicate early delivery.
Probability	Specify a number between 0 and 1 corresponding to each estimation of days late for the item. The probabilities should sum to 1.
Supplier Lead Time Variability	Specify a percentage. See Setting Plan-Level Lead Time Variability Default Values, page 4-16.

6. Save your work.

Setting Penalty Costs

Penalty costs are what you think will be the costs for violating such things as supplier capacity and resource capacity. You set this up to indicate to the inventory planning engine how much it is going to cost when you exceed the capacities. For example, you can set up the cost of overloading your suppliers and the cost of overworking your production team.

You can set the penalty costs at either the plan options level or at the profile options level. The penalty costs at the plan options level takes precedence over the penalty costs set up at the profile options level.

The inventory planning engine uses the penalty costs or the service level or both in calculating safety stock quantities as shown in the following table:

Plan Level Defaults	Enforce Service Level	Enforce Capacity
Service Level	Used	Used only for target safety stock calculation
Resource Penalty Costs	Used	Used only for target safety stock calculation.
Material Penalty Costs	Used	Used only for target safety stock calculation
Late Demand Penalty Costs	Not used	Used

When you enforce service level constraints, the inventory planning engine calculates safety stock quantities for the specified service levels while minimizing penalty costs for exceeding material capacity, exceeding resource capacity, and exceeding transportation capacity.

Penalty costs for late demand is used only when you enforce capacity constraints.

Note: You can specify either input service level or input penalty costs for late demand.

Setting Item Purchase Price by Supplier

During the collections process, Oracle Inventory Optimization captures the item purchase price by supplier and supplier site by taking the unit price from the most recent purchase order for each item. Oracle Inventory Optimization uses the item purchase price to calculate the purchasing cost for an item. You can view the item purchase price in the Supplier Capacity window. You can navigate to this window from both the Collections Workbench and the Planner Workbench.

To view item price by supplier:

Steps:

1. Navigate to the Collections Workbench (Collections > View Collected Data) or Planner Workbench (Inventory Plan > Workbench).
2. View by Suppliers.
3. In the Navigator, drill down and select an item underneath a supplier.
4. Select Supplier Information from the right-click popup menu. The Supplier

Capacity window appears.

Supplier Capacity window

Supplier Capacity (TST:M1)

Supplier	Item	Org	Supplier Price
00PKCTO SUPPLIER	x-desktop	TST:V1	
00PKCTO SUPPLIER	00PKCTOCELL	TST:V1	
00PKCTO SUPPLIER	PKBATTERY	TST:V1	
00PKCTO SUPPLIER	PKMOVE	TST:V1	

Supplier Capacity Supplier Flexfences

From	To	Capacity

5. Scroll to the right to view the Supplier Price field.

Setting Performance Indicators

You can compare inventory plan output to the following performance indicators:

- Inventory turns
- Service level
- Planned utilization
- Margin
- Margin percentage
- Cost breakdown
- Inventory value

Note: You can set targets for all Performance Indicators except margin and cost breakdown.

For information on setting performance indicator targets, see the *Oracle Business Intelligence System Implementation Guide*.

The Constraints Tabbed Region, page 3-19

Reviewing Exception Messages, page 5-16

Overview of Analysis Workbench, page 6-1

User-Specified Safety Stock, page 7-5

Setting Intermittent Demand

Oracle Inventory Optimization explicitly supports the computation of Safety Stock and service level calculations for Intermittent demands. Sparse or sporadic demands fed into Oracle Inventory Optimization from Service Parts Planning have been generated using a statistical method designated as being for intermittent demands, or forecasts that are designated via plan options to be of the intermittent demand variety, will now be assumed by Oracle Inventory Optimization to have a more appropriate Poisson distribution.

To define intermittent demand

1. Log on to Oracle Inventory Optimization.
2. From the Navigator, choose Inventory Planner> Item Attribute Mass Maintenance.
The Item Attribute Mass Maintenance table appears.
3. Populate the Item Attribute Mass Maintenance table as shown in the table below.

Field	Values	Description
-------	--------	-------------

Intermittent Demand	Yes, No	<p>Enter values at level ITEM-ORGANIZATION, ITEM-ZONE.</p> <p>If set to YES, safety stock for the Item-Organization or Item-Zone is computed using POISSON distribution.</p> <p>If set to NO, Safety stock for the Item-Organization or Item-Zone is computed using NORMAL distribution.</p>
Mean Inter Arrival		Enter the mean inter arrival in days.

Example

Example of Intermittent Demand

This example illustrates item-organizations with sporadic or intermittent demands.

Item	Intermittent Demand	Mean Inter Arrival (time in days)	Forecast Rule for Demands
RMR_IO_B	Yes	10	
RMR_IO_C	No	4	St-1
RMR_IO_D	No	4	St-1

In the above table, the safety stock for Item RMR_IO_B is computed using Poisson distribution because Intermittent Demand is set to Yes. For Items RMR_IO_C and RMR_IO_D, safety stock is computed using Normal distribution.

Safety Stock Calculations for Item: RMR_IO_B (Poisson distribution)

Item: RMR_IO_B; Since Intermittent Demand is set to YES; it is modeled as Poisson

Item Lead Time (L) = 5 days

Demand Rate (Lambda) = 1/(Mean Inter Arrival Time) = 1/10 = 0.1

Service Level (SL) = 90%

Viewing Output

This chapter details how to view the output after you run an inventory plan.

This chapter covers the following topics:

- Overview of Viewing Output
- Queries
- Creating Queries
- Editing and Maintaining Queries
- Executing Queries
- Setting Queries Preferences
- Performance Indicators
- Time-phased Supply and Demand
- Visibility to Forecast Variability
- Viewing the Demand Fulfillment Lead Time
- Safety Stock and Target Safety Stock
- Safety Stock Analysis - Viewing the Plan
- Resource Requirements
- Material/Resource Availability
- Reviewing Exception Messages

Overview of Viewing Output

You can view the output of your inventory plans using the Planner Workbench as well as the Analysis Workbench. The Analysis Workbench enables you to view and analyze the output both at the aggregate level and the detailed level. The Planner Workbench enables you to do a detailed analysis of the output.

For more information on the Analysis Workbench, see Overview of Analysis Workbench, page 6-1

This chapter explains how you can view the output through Planner Workbench using the following:

- Horizontal plan
- Vertical Plan
- Performance Indicators
- Time-phased Supply and Demand
- Constrained and Unconstrained Safety Stocks

For information on the Horizontal Plan window and the Vertical Plan window, see *Oracle Advanced Planning Implementation and User's Guide*.

Queries

Inventory Optimization supports personal queries for orders. This allows planners to retrieve key demand and supply orders such as: forecasts for all items with service level violations. Queries can be specified as Public, and then shared with other planners.

In addition to retrieving orders on the basis of supply/demand attributes such as quantity, due date, planner code, and order type, planners can retrieve orders related to Inventory Optimization exceptions. The Match All and Match Any features are available for query criteria. Match All is similar to the 'and' logic condition, and Match Any is similar to the 'or' logic condition.

Planners can create multiple queries, with each query addressing a specific set of orders that need to be reviewed. Multiple sub queries can be combined to form a query. When the Order query is executed, all the sub queries within the Order query are executed. Thus, the displayed orders are the result of the union of all executed sub queries. Any of the individual query criteria can be made inactive by deselecting the 'Active' check box. This offers flexibility in restructuring the query.

Planners can selectively execute the queries, review the results directly, and take necessary actions using standard processes. Execution of the query opens the Supply and Demand window directly.

See:

- Queries, page 5-3
- Editing and Maintaining Queries, page 5-5
- Executing Queries, page 5-5

- Setting Queries Preferences, page 5-6

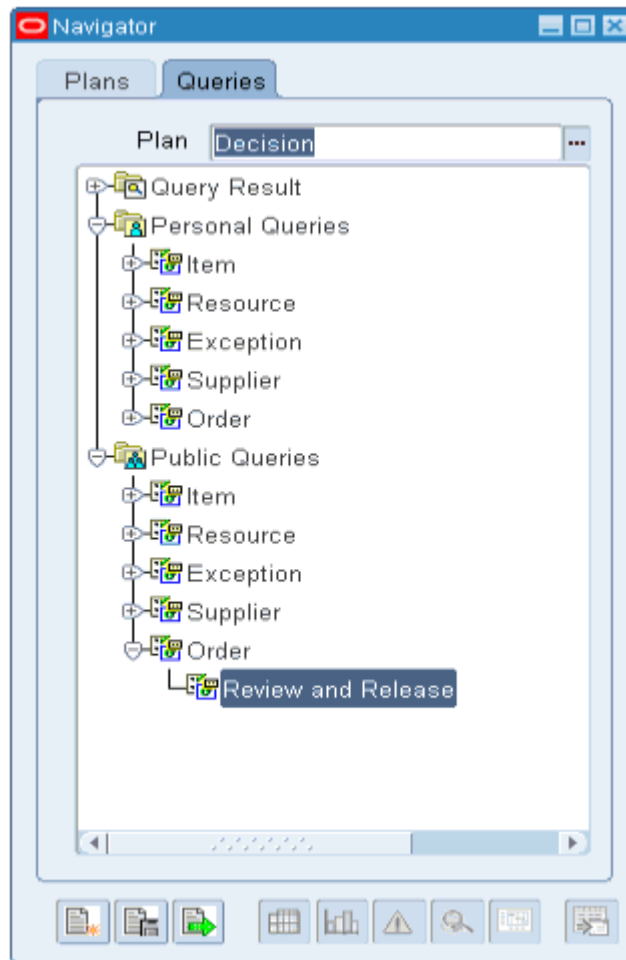
Creating Queries

To create a query:

Steps:

1. Open the Planner Workbench. From the Inventory Planner responsibility, navigate:
Inventory Plan > Workbench
The Navigator window appears.
2. Switch to Queries Tab, if it has not been set as the default Tab in the Navigator Pane.

See Setting Queries Preferences, page 5-6.



3. Select the 'Create Query' icon located at the bottom left of the Navigator Pane.
The Create Query window appears.

Query Name: Review and Release

Query Type: Orders Owner: MFG Public: Yes

Query

Active	Name	Description
<input checked="" type="checkbox"/>	Releasable Planned orders	OK to release
<input checked="" type="checkbox"/>	New Purchase orders	New Buy orders
<input type="checkbox"/>		
<input type="checkbox"/>		

Query Criteria

Active ☒ Match All ☐ Match Any

Criteria	Condition	From	To
<input checked="" type="checkbox"/> Order Type	Equals	Planned order	
<input checked="" type="checkbox"/> Suggested Due Date	Less Than	31/07/2006	
<input checked="" type="checkbox"/> Exception Name	Is Not	Items with a shortage	
<input checked="" type="checkbox"/> Planner	Equals	C. Baker	
<input type="checkbox"/>			
<input type="checkbox"/>			

Buttons: Save, Save As, Delete, Clear, Execute

4. Specify a Query Name and Description.
5. Select a Query Type, Owner, and specify whether this query will be available to the public.
6. (Optional) If this query includes existing sub-queries, in the Query region, list the Names of the sub queries.

Note: Multiple sub-queries can be entered, each with its own criteria Upon execution, all sub-queries will be executed

7. Select the Active check box for sub-queries that you want to be in effect.
8. In the Query Criteria region, enter the query criteria. Multiple criteria can be specified.

- Select the Match All radio button to retrieve the intersection of all criteria.
 - Select the Match Any radio button to retrieve the union of all criteria.
9. Click Save.

Editing and Maintaining Queries

To edit a query:

Steps:

1. Open the planner work bench, and then switch to Queries tab if the Queries tab is not the default tab in the Navigator pane.
2. If the query is specified as a non public query, drill down to the query from the Personal Queries node.
3. If the query is specified as a Public query, drill down from the Public Queries node.

Note: Queries specified as Public can only be edited by the user who created the query. Other users can only view and use them.

4. Drill down to the required Order query from the Order Node. Highlight the required query. Right mouse click the query, and then select View Query from the right-click menu.
5. Edit the query, and then click Save.

Executing Queries

To execute a query:

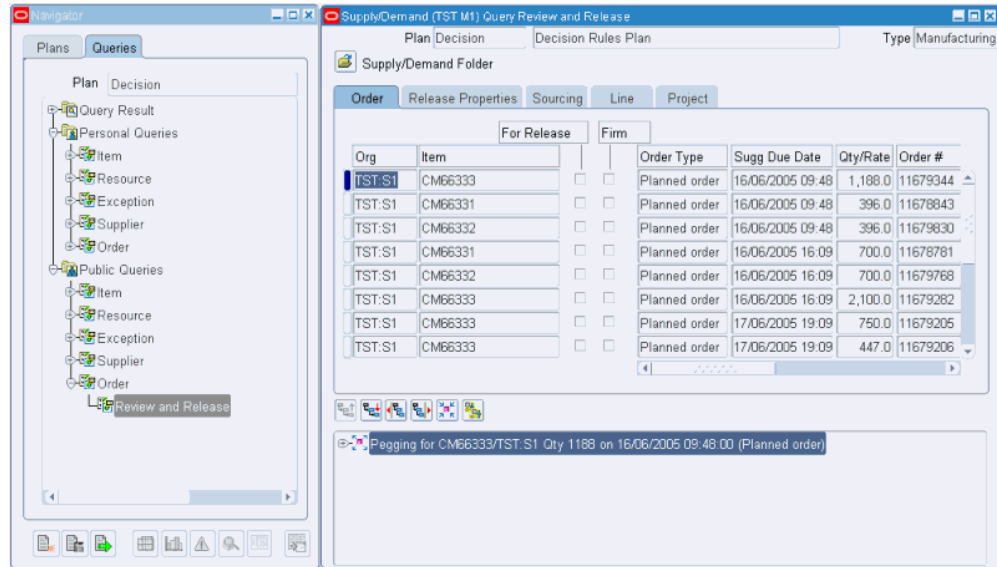
Steps:

1. Open the planner work bench, and then switch to Queries tab if the Queries tab is not the default tab in the Navigator pane.

Drill down to the Order Query to be executed, and highlight the query.

2. Specify the Plan name against which the query should be executed.
3. Click the Execute Query icon.

The Supply/Demand Query Review and Release window appears.



Note: Queries can also be executed using the right mouse menu option of "Execute Query".

Setting Queries Preferences

You can set preferences to:

- Cause the navigator pane to open to the Queries tab instead of the Plans tab.
- Specify the Auto Execute Query. Upon opening the workbench, the Auto Execute Query automatically runs, and results are shown in the Supply/Demand Query Review and Release window.
- Specify the Default Plan. Auto Execute Query executes against the Default Plan.

To set query preferences.

Steps:

1. Open the Planner Workbench. From the Inventory Planner responsibility, navigate:
Inventory Plan > Workbench
The Navigator window appears.
2. Navigate to the Preferences window.
Tools > Preferences
The Preferences window appears.

3. Select the Other tab.

The screenshot shows the 'Preferences' dialog box with the 'Other' tab selected. The 'Preference Set' is 'Default'. The 'Other' tab is highlighted in the top navigation bar. The 'Supply/Demand' section contains checkboxes for 'Release Phantoms' (unchecked), 'Release Configurations' (checked), 'Firm Jobs' (unchecked), 'Include Sales Orders' (checked), and 'Release VMI Items' (checked). Below these are text fields for 'Job Status' (Released), 'Job Class' (N), and 'Req Group By' (All). The 'Pegging Defaults' section has a checkbox for 'Show Item Description in Pegging' (unchecked). The 'General' section includes 'Category Set' (ASCP Item Category), 'Snapshot Start' (11/07/2005 10:40:30), 'Plan Start' (11/07/2005 10:45:45), 'View Recommendations for (Days from Today):' (10), 'Default Plan' (Decision), 'Auto Execute Query' (My Critical Exce...), 'Default Tab' (Queries), and 'Default View By' (Actions). Checkboxes for 'Retain find criteria' (checked), 'Block Zero Res. Requirements' (checked), and 'Expand All Actions' (unchecked) are also present. A 'Save (S)' button is at the bottom right.

4. In the Default Tab field, select Queries from the list of values.
5. In the Auto Execute Query field, select the query to automatically execute when the Workbench opens.
6. In the Default Plan field, enter the name of the default plan against which you want the automatic query to execute.
7. Click Save.

Performance Indicators

After you run a plan, you can evaluate its performance by comparing its parameters. For example, you can compare the plan's achievable service level with its target service level. This enables you to select the inventory plan that best meets your organizational objectives that you have defined.

The Key Indicators window is a summary chart that provides a graphical display of an inventory plan's key performance indicators. Using this window, you can see how the inventory plan performs relative to the following measures:

- Inventory turns
- Service level
- Planned utilization
- Margin
- Margin percentage
- Cost breakdown
- Inventory value

To navigate to the Key Indicators window, select a plan in the Navigator and choose Key Indicators from the right-click popup menu.

For more information on performance indicators, see *Oracle Advanced Planning Implementation and User's Guide*.

Time-phased Supply and Demand

You can view time-phased supply and demand for all the items in your inventory plan using the Supply/Demand window. This enables you to analyze factors regarding supply and demand on a day-by-day or bucket-by-bucket basis. For example, you can find out how demands are met and how supplies are planned over a specify time frame. You can navigate to the Supply/Demand window from various node types such as items, organizations, and plans from the Navigator. In addition to the Navigator, you can also drill down to the Supply/Demand window from other windows such as the Vertical Plan window.

Supply/Demand window

Org	Item	For Release	Firm	Priority	Mean Absolute Deviation	Mean Absolute Percentage Error
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			
TST:M1	AS86312	<input type="checkbox"/>	<input type="checkbox"/>			

For more information on navigating to the Supply/Demand window and its fields, see *Oracle Advanced Planning Implementation and User's Guide*.

Visibility to Forecast Variability

With Release 12, the mean absolute deviation (MAD) and the mean absolute percentage error (MAPE) metrics for forecasts calculated in Oracle Demand Planning and fed into Oracle Inventory Optimization are now visible in new columns of the Supply/Demand window of the Inventory Optimization Planner Workbench.

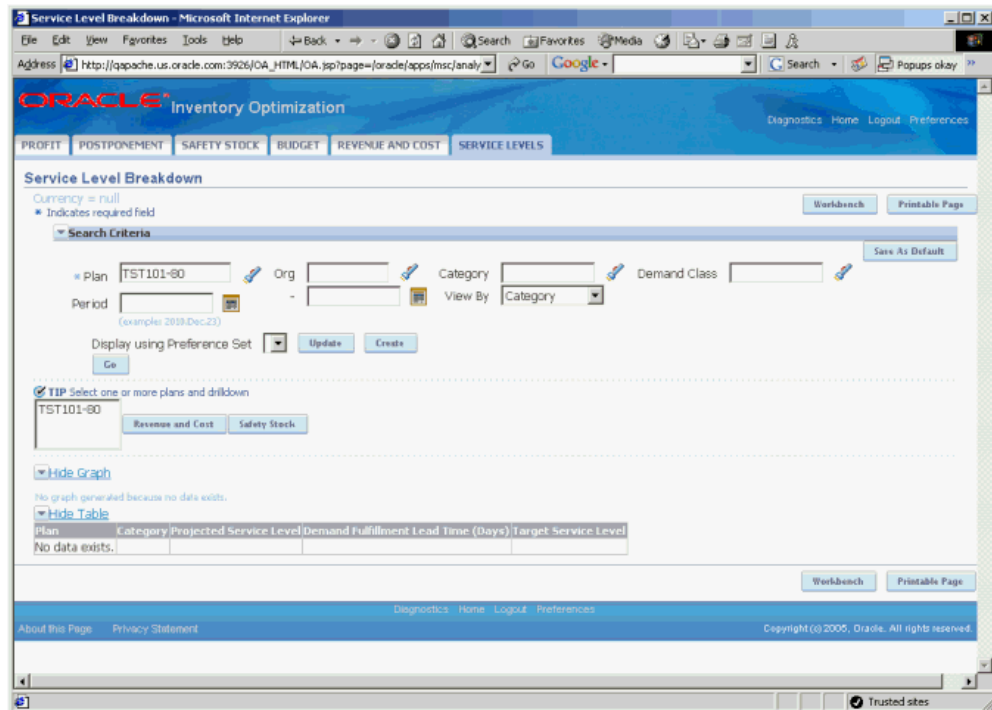
Org	Item	For Release	Firm	Order Type	Sugg Due Date	Orig Qty	Mean Absolute Deviation	Mean Absolute Percentage Error
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	30-DEC-2005 23	-396		247.881902407652
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	06-JAN-2006 23	-308		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	13-JAN-2006 23	-364		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	20-JAN-2006 23	-383		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	27-JAN-2006 23	-420		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	03-FEB-2006 23	-172		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	10-FEB-2006 23	-385		55
TST:D2	AS86311	<input type="checkbox"/>	<input type="checkbox"/>	Forecast	17-FEB-2006 23	-394		55

Viewing the Demand Fulfillment Lead Time

When reviewing a plan, the fulfillment lead time assigned at different levels can be viewed in the service levels folder of the analysis workbench. The fulfillment lead time shown is the value set by the user in the service level set at the particular level of aggregation being viewed. In the case where there is no assignment at the level at which the user is viewing the data, the results of default values, or assignments at more aggregate and less specific levels are not shown.

Steps:

1. Navigate to the Service Level Breakdown page.
Inventory Analyst > Service Levels Folder
2. Select one or more Plans. Click Go.



This folder shows the service levels and fulfillment lead times at the level that you are viewing the data.

Safety Stock and Target Safety Stock

Safety stock levels are the stock levels required to provide a specific service level. The plan constraints such as budget and capacity constraints are considered when the safety stock levels are calculated. Target safety stock levels are the safety stock levels without

considering the plan constraints.

The inventory planning engine calculates and displays both safety stock and target safety stock levels. It calculates the target safety stock based on the target service level that you specify. It calculates the safety stock level after taking the constraints into account. Viewing the target safety stock and safety stock levels helps you find answers to the following questions:

- What service level is achievable?
- What do I need to do in order to achieve the target service level?

You can view the time-phased safety stock quantities for all items in a plan using the Horizontal Plan window. The values for the safety stock displayed in the Horizontal Plan and the Supply/Demand window may vary because the inventory planning engine rounds off the safety stock quantity in the horizontal plan. To access the Horizontal Plan window, click the Horizontal Plan icon in the Planner Workbench.

Horizontal Plan window

			HP:0:SL90 Current		
			03-JUL-...	04-JUL-2	
				04-J...	
TST:M1	SB6632	Sales Orders	0	0	0
	4	Forecast	0	0	0
		Dependent demand	0	0	0
		Gross requirements	0	0	0
		Requisitions	0	0	0
		Planned orders	0	0	0
		Total supply	0	0	0
		Beginning on hand	0	0	0
		Projected available balance	0	0	0
		Projected Safety stock - non poole...	0	0	0
		Projected Safety stock (units)	0	0	0
		% - Manufacturing Variability	0	0	0
		% - Supplier lead time Variability	0	0	0
		% - Intransit lead time Variability	0	0	0
		% - Demand Variability	0	0	0

		▼ HP:0:SL90 Current F	► 03-JUL-...	▼ 04-JUL-20	► 04-JUL-20
	Projected Safety stock (days of su...	0	0	0	0
	Projected Safety stock (value)	0	0	0	0
	Target safety stocks (units)	0	0	0	0
	Target safety stocks (days of supp...	0	0	0	0
	Target safety stocks (value)	0	0	0	0
	Target Service Level	0	0	0	0
	Projected Service Level	0	0	0	0
	Mean absolute deviation	0	0	0	0
	Mean absolute percent error	0	0	0	0

With Release 12, the horizontal plan of the Inventory Optimization Planner Workbench can now display the following additional rows:

- Target Service Level, expressed in percent (%)
- Achieved Service Level, expressed in percent (%)
- Mean Absolute Deviation
- Mean Absolute Percent Error
- Safety stock - non pooled (units)
- Safety stock units sub rows that show the percentage of safety stock to be carried to protect against the following types of variability:
 - Manufacturing variability
 - Supplier lead time variability
 - In-transit lead time variability
 - Demand variability

Note: If you want the inventory planning engine to consider an item as a purchased item, ensure that you have a sourcing rule specifying a buy source. If you do not define sourcing details for an item, the inventory planning engine considers the item as a make item. If an item is a buy item, the inventory planning engine considers the preprocessing, processing and postprocessing lead times to calculate the safety stock.

Safety Stock Analysis - Viewing the Plan

Steps:

1. From the Inventory Analyst responsibility, navigate to the Safety Stock folder.

Click the Safety Stock tab

The safety stock tab of the Inventory Optimization page opens.

The screenshot shows a web browser window titled "Safety Stock Analysis - Microsoft Internet Explorer". The address bar shows a URL from Oracle. The page displays a table with columns for dates (10-Jan-2011, 07-Feb-2011, 14-Mar-2011, 11-Apr-2011, 09-May-2011) and rows for various safety stock metrics. The table is organized into sections for SDCP-M1 and SDCP-M2.

		10-Jan-2011	07-Feb-2011	14-Mar-2011	11-Apr-2011	09-May-2011
		95%-SL	95%-SL+LTV	95%-SL	95%-SL+LTV	95%-SL
SDCP-M1	Projected Safety Stock (Units)	667	705	667	705	667
	- Manufacturing Variability (%)	0	5	0	5	0
	- Supplier Variability (%)	0	6	0	6	0
	- Intransit Lead Time Variability (%)	0	7	0	7	0
	- Demand Variability (%)	100	82	100	82	100
	Target Service Level (%)	95	95	95	95	95
SDCP-M2	Projected Safety Stock (Units)	0	0	265	430	265
	- Manufacturing Variability (%)	0	0	0	23	0
	- Supplier Variability (%)	0	0	0	28	0
	- Intransit Lead Time Variability (%)	0	0	0	0	0
	- Demand Variability (%)	0	0	100	49	100
	Target Service Level (%)	95	95	95	95	95

The Safety Stock folder in the analysis workbench displays the percent (%) contribution to safety stock from each source of variability (demand, manufacturing lead time, in-transit lead time, and supplier lead time variability).

Resource Requirements

Resource requirements are the number of hours for which resources are needed to

process an order. You can view time-phased resource requirements for all resources in your inventory plan using the Resource Requirements window. This enables you to find out the specific resources and the time period for which these resources will be needed for each order. The resource requirements are set up Oracle Bills of Material application using routings.

You can navigate to the Resource Requirements window in one of the following ways:

- From the Resources window, click the Requirements button.
- From the Navigator, select a resource and choose Resource Requirements from the Resources right-click popup menu.

For more information on the Resources Requirements window and its fields, see *Oracle Advanced Planning Implementation and User's Guide*.

Note: You can only view resource requirements using Oracle Inventory Optimization. For information on modifying resource requirements, see *Oracle Bills of Material User's Guide*.

Material/Resource Availability

Material availability is the capacity of a supplier site to produce a specific item. This is set up in the Collections Workbench of Oracle Inventory Optimization. Resource availability is the number of hours a resource is available for production. This is set up in Oracle Bills of Material.

By viewing material and resource availability, you can find out how much can be manufactured without having to look at what is currently available. You can make changes to resource availability using the Oracle Bills of Material application and to material availability using the Collections Workbench. You can also make changes to these using the Planner Workbench, but these changes will be visible only in Oracle Advanced Supply Chain Planning and not in Oracle Inventory Optimization.

You can view time-phased material and resource availability for all items and resources in your inventory plan using the Resource Availability Summary window. You can navigate to the Resource Availability Summary window in one of the following ways:

- From the Resources window, click the Availability button.
- From the Navigator, select a resource and choose Resource Availability from the Resources right-click popup menu.

Resource Availability Summary window

The screenshot shows a window titled "Resource Availability Summary (TST:M1)". Inside the window is a table with the following columns: Org, Dept/Line, Resource, From Date, To Date, Total Available, and UOM. The table is currently empty. Below the table, there are two buttons: "Requirements" and "Details".

For more information on the Resource Availability Summary window and its fields, see *Oracle Advanced Planning Implementation and User's Guide*.

Reviewing Exception Messages

The inventory planning engine generates constraint exception messages to alert you about a specific situation that needs your intervention and also suggests actions to resolve the problem.

The exception messages generated in Inventory Optimization are the same as those available in Oracle Advanced Supply Chain Planning. For information on what exceptions are generated for which type of plans, how exceptions can be viewed and analyzed, and how exception situations potentially can be resolved, see *Oracle Advanced Planning Implementation and User's Guide*.

The following is a list of exceptions for Oracle Inventory Optimization:

- Late Sales Orders and Forecasts
 - Past due transportation resource constraint
 - Past due forecast
- Material and Resource Capacity
 - Material constraint
 - Resource constraint

- Resource overloaded
- Supplier capacity overloaded
- Resource underloaded
- Transportation and Distribution
 - Transportation resource overloaded
 - Transportation resource under loaded
- Shortage and Excess
 - Item with a shortage
 - Item with excess inventory
- Substitutes and Alternates Used
 - Planned order uses alternate BOM
 - Planned order uses alternate routing
 - Planned order uses substitute components
 - Planned order uses alternate resources
 - Order sourced from alternate facility
 - Order sourced from alternate supplier
- Item Exceptions
 - Items with negative starting onhand
 - Items with no activity

Note: The inventory planning engine generates material and resource constraint exception messages only when the Enforce Capacity Constraints check box in the Constraints Tab of the Plan Options window is checked. In this option, the output contains both the target safety stock and the safety stock levels.

Analysis Workbench

This chapter describes the Analysis Workbench and how you can use it to analyze your inventory plans.

This chapter covers the following topics:

- Overview of Analysis Workbench
- Analyzing Inventory Plans
- Using the Analysis Workbench
- Creating and Editing Preference Sets
- Analyzing Service Level Versus Profit
- Analyzing Postponement
- Analyzing Safety Stocks
- Analyzing Inventory Budgets
- Analyzing Revenue and Cost Breakdown
- Analyzing Service Level Breakdown

Overview of Analysis Workbench

You create and run several inventory plans to evaluate different scenarios. You compare and analyze these plans to determine the most optimal one. Analysis Workbench enables you to compare and analyze multiple inventory plans by providing graphical and tabular comparison.

You can analyze the output from your inventory plans at both aggregate and detail levels. The Analysis Workbench provides context-sensitive drill down that enables root-cause analysis. For example, if achieving a specific service level costs an excessive amount of money, you can drill down to cost analysis for a break down of costs and identify the categories or items that contribute to the high costs.

You can use the Analysis Workbench to view and analyze factors such as budgets,

inventory levels, and costs. In addition, you can use the Analysis Workbench to determine target service level. The following are some of the questions for which you can find answers using the Analysis Workbench:

- What is my most profitable service level?
- Have I achieved my target service levels?
- How much inventory do I have to carry for a target service level?
- Where should I position my inventories?
- How is my inventory budget allocated?
- What is my cost breakdown?

Note: The Analysis Workbench is displayed in a Web browser. For information on the Web browsers that you need for Analysis Workbench, see *OA Framework Documentation*.

Analyzing Inventory Plans

You can use the analysis pages to analyze the output of your inventory plans. The following analysis pages are available in the Analysis Workbench:

- Service Level versus Profit Analysis
This page enables you to determine the estimated profit for a specific service level. You can use this page to analyze multiple plans corresponding to different service levels and identify the plan with the most profitable service level.
- Postponement Analysis
This page enables you to view the effect of postponement on safety stock carrying cost and inventory value.
- Safety Stock Analysis
This page enables you to analyze the safety stock levels. You can use this page to analyze the safety stock details for a specific service level.
- Inventory Budget Analysis
This page enables you to analyze inventory budgets. You can analyze the budget value and the corresponding inventory value and service level details. You can use this page to determine the budget required to meet a specific service level.
- Revenue and Cost Breakdown

This page enables you to view revenue and cost breakdown details such as production cost, carrying cost, and purchasing cost.

- Service Level Breakdown

This page enables you to view the achievable service levels at various levels of aggregation.

You can view information related to a specific aspect of your inventory plan in an analysis page. For example, you can view the cost-related information such as planned production cost and planned purchasing cost in the Revenue and Cost Breakdown page. For a complete analysis of your inventory plans, you may need to use multiple analysis pages along with Planner Workbench.

The following is an example of how you may want to use the analysis pages for analyzing your inventory plans:

After you create and run plans with various target service levels, you may determine the most profitable service level using the Planned Service Level Vs Profit page.

1. You may then use the Inventory Budget Analysis page to find out the budget required to achieve the most profitable service level.
2. You may then determine the safety stock levels for the most profitable service level using the Safety Stock Analysis page.
3. You can then access the Planner Workbench for more information on factors such as item level supply and demand, the BOM structure, and sourcing.

Using the Analysis Workbench

The following are the steps involved in using the Analysis Workbench.

1. Run your inventory plans.

You need to run the plans that you want to analyze before you use the Analysis Workbench. For information on running inventory plans, see *Running an Inventory Plan*, page 2-1.

2. Select the category set in the Preferences window of the Planner Workbench.

To use the Analysis Workbench, you need to select the category set of the items that are to be displayed in the Analysis Workbench. You can specify the category set in the Category Set field of the Other tabbed region in the Preferences window. For more information on the Preferences window, see *Oracle Advanced Planning Implementation and User's Guide*. You can analyze only those categories and items belonging to the category set that you select in the Preferences window.

Note: You can analyze items and categories belonging to one category set at a time. The items and categories that appear in the analysis pages belong to an item category set defined in the Inventory Optimization Workbench preferences, Others tab.

3. Specify the number of decimal places in the Preferences window of the Planner Workbench.

Optionally, you can specify the required number of decimal places for the numerical data displayed in the Analysis Workbench. You can specify this in the Decimal Places field of the Material Plan tabbed region in the Preferences window. After you set the decimal places, numerical data is displayed with the specified number of decimal places in all the analysis pages. For more information on the Preferences window, see *Oracle Advanced Planning Implementation and User's Guide*.

4. Create your preference sets.

Optionally, you can create preference sets. Preference sets enable you to customize how information is displayed in an analysis page. For example, you can choose to hide or display the graphical display in an analysis page. For more information, see the section on creating and editing preference sets.

5. Navigate to the Analysis Workbench from the Navigator.
6. Select an analysis page based on your needs.
7. Search and select one or more plans for analysis.

You can select specific plans and navigate to other analysis pages for a complete analysis of the plans.

Note: You can analyze only plans that have matching start dates, weekly buckets, and period buckets.

The Search Criteria area in the analysis pages enables you to analyze specific elements of your inventory plans. For example, you can analyze the details of a specific organization in the plan. After you select the plans for analysis, you can search based on the following:

- Organization
- Category
- Demand class
- Period

- Item
- Customer
- Customer class
- ABC classification

The availability of fields for searching these parameters depends on the analysis page that you select. You can save a specific search criteria as the default for an analysis page by clicking Save As Default in the analysis page. The selected search criteria appear automatically every time you navigate to the analysis page.

8. Use the View By field to specify your view by preference. For example, you can view by period for a month-wise display of the details. The availability of this field depends on the analysis page that you select.

Creating and Editing Preference Sets

A preference set is a group of options that you specify for viewing information in the analysis pages. Preference sets enable you to specify how and what information you want to be displayed in an analysis page. For example, you can specify the row headings for the tabular display in the Inventory Budget Analysis page. You can create and edit preference sets using the Preferences pages.

You can create multiple preference sets for an analysis page. You can also make a preference set as the default for an analysis page so that the preference set is chosen automatically every time you navigate to that analysis page. The preference sets that you create for an analysis page are exclusive to that page. Depending on the analysis page, preference sets enable you to specify options such as the number of rows and columns for printing and the type of calendar for viewing information by period or week.

To create and edit preference sets

Steps:

1. To create a preference set, click Click/Edit from an analysis page. To edit a preference set, select the preference set from the list in the Display using Preference Set field in the analysis page and click Click/Edit.
 - The corresponding Preferences page appears. The Preferences page of Inventory Budget Analysis is shown as an example.

Preferences page of Inventory Budget Analysis

2. Use the information in the following table to complete the fields in the Preferences pages.

Field	Description
Preference Set Name	Enter a name for the preference set.
Default	Select this check box to make a preference set as the default for the analysis page. The settings are automatically applied when you navigate to this analysis page.
Available	This column displays the available row headings for the tabular display in the Safety Stock Analysis page or the Inventory Budget Analysis page. Select items in the list and move them to the Selected column to include them in the analysis page.
Selected	This column displays the selected row headings for the tabular display in the Safety Stock Analysis page or the Inventory Budget Analysis page. Select items in the list and move them to the Available column to remove them from the analysis page.

Field	Description
Rows	Specify the number of rows if you are printing the information in the analysis page.
Columns	Specify the number of columns if you are printing the information in the analysis page.
Orientation	Specify the page orientation if you are printing the information in the analysis page.
Graphing Options	<p>You can choose to hide or display the graphical display in the analysis page. This is available for the following analysis pages:</p> <p>Service Level versus Profit Analysis</p> <p>Postponement Analysis</p> <p>Safety Stock Analysis</p> <p>Inventory Budget Analysis</p> <p>Revenue and Cost Breakdown</p> <p>Service Level Breakdown</p>
Reporting Calendar	You can select the type of calendar for viewing by period or week. To view by week, you need to select manufacturing calendar from the list.

3. Click Save to save the preference set.

Analyzing Service Level Versus Profit

Service level is one of the factors that can affect your profit. Typically profits increase as you increase the service level, but increased service level beyond a certain point may not increase the profits because of the relative increase in inventory costs. To determine the most profitable service level, you can create and run multiple plans depicting different service levels. You can then analyze these plans using the Service Level versus Profit Analysis page of the Analysis Workbench to determine the most profitable service level.

You can also widen the scope of your analysis by navigating to other related analysis pages from the Service Level versus Profit Analysis page. You can navigate to other analysis pages the same search criteria specified in the Service Level versus Profit Analysis page. You can select the plans from the list and navigate to the following analysis pages from the Service Level versus Profit Analysis page:

- Revenue and Cost Breakdown
- Postponement Analysis
- Inventory Budget Analysis
- Service Level Breakdown
- Safety Stock Analysis

Navigating to Other Related Analysis Pages

✓ **TIP** Select one or more plans and drilldown



You can view service level versus profit details in both tabular and graphical formats. The Service Level versus Profit Analysis page provides two graphs, the Plan Gross Profit Breakdown graph and the Plan Gross Profit Percent graph. The Plan Gross Profit Breakdown graph shows the planned total cost, planned revenue, and planned gross profit against the service level for the selected inventory plans. The planned gross profit percent shows the planned gross profit percentage against the service level for the selected inventory plans.

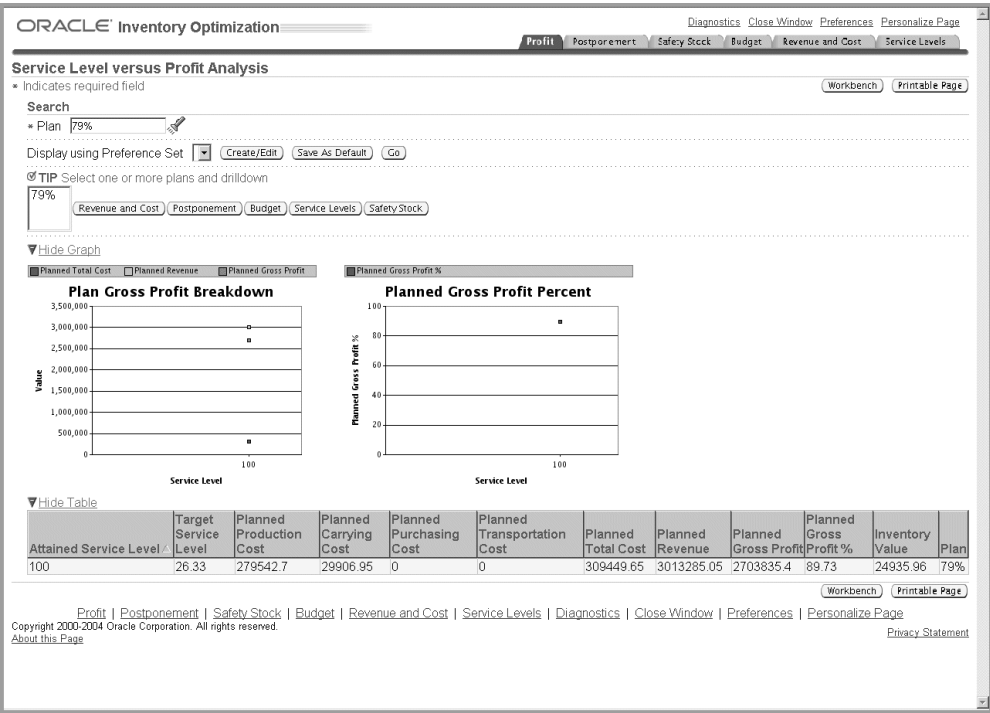
To analyze service level versus profit

Steps:

1. From the Navigator, choose Analysis Workbench.

The Service Level versus Profit Analysis page appears.

Service Level versus Profit Analysis page



2. Use the information in the following table to complete the fields in the Service Level versus Profit Analysis page.

Field	Description
Plan	Select the inventory plans that you want to analyze. To set the selected plans as the default plans to be analyzed in this page, click Save As Default. The selected plans appear automatically every time you navigate to this analysis page.
Display using Preference Set	Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets under Analyzing Inventory Plans, page 6-2.

3. Click Go to analyze the selected inventory plans.

The inventory planning engine displays the service level versus profit details for the

selected plans. The following table describes the column headings of the tabular display in the Service Level versus Profit Analysis page:

Column Heading	Description
Attained Service Level	The achievable service level for a plan. The inventory planning engine calculates the attained service level based on the inputs for the plan.
Target Service Level	The target service level that you have set up. You can set the target service level for a plan in the Constraints tabbed region of the Plan Options window. For more information on setting target service levels, see <i>Setting Target Service Levels</i> , page 4-2.
Planned Production Cost	<p>The estimated cost of producing the planned items. The inventory planning engine calculates the production cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the planned production cost for an item by multiplying the resource unit cost and the required hours. The resource unit cost and required hours for items are specified in Oracle Bills of Material. For more information, see the <i>Oracle Bills of Material User's Guide</i>.</p>
Planned Carrying Cost	<p>The estimated cost of stocking the planned items. The inventory planning engine calculates the carrying cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the carrying cost based on the carrying cost percentage. Carrying cost percentage can be set up at the item level using Oracle Inventory or at the profile option level. The carrying cost percentage set up at the item level takes precedence over the carrying cost percentage set up at the profile option level. For information on setting up carrying cost percentage at the item level, see <i>Oracle Inventory User's Guide</i>.</p>

Column Heading	Description
Planned Purchasing Cost	<p>The estimated purchasing cost for the planned items. The inventory planning engine calculates the purchasing cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the purchasing cost for an item based on its standard cost. The standard costs for items are specified in purchase orders of type blanket purchase agreement. These purchase orders are created in the Oracle Purchasing application. For more information, see <i>Oracle Purchasing User's Guide</i>.</p> <p>The standard costs for items can also be specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>. The standard costs specified in Oracle Purchasing takes precedence over the standard costs specified in Oracle Cost Management.</p>

Column Heading	Description
Planned Transportation Cost	<p>The estimated cost for transporting the planned items from an organization to another. The inventory planning engine calculates the transportation cost for each item in the plan and aggregates the cost at the plan level. The inventory planning engine calculates the transportation cost for an item by multiplying the number of unit items supplied, unit weight or unit volume, and transportation cost per unit weight or unit volume.</p> <p>The inventory planning engine calculates the number of units supplied based on the item's demand schedule. It takes the organization name from which the item is sourced and the organization name to which the item is supplied from the item's sourcing rule. It also takes the shipment method from the sourcing rule.</p> <p>The inventory planning engine takes the unit weight or unit volume for the item and the cost of transporting an unit weight or unit volume of the item between the two organizations by the specified shipping method from Oracle Inventory.</p> <p>Unit weight or unit volume for an item is specified in the Physical Attributes tabbed region of Master Items window or Organization Items window of Oracle Inventory. The cost of transporting a unit weight or unit volume between two organization using a specific shipping method is specified in the Transit window of Oracle Inventory.</p> <p>For information on demand schedule, see the section on demand schedules in The Organizations Tabbed Region, page 3-9. For information on sourcing rules, see <i>Oracle Advanced Planning Implementation and User's Guide</i>. For information on transportation cost per unit weight or unit volume of an item, see <i>Oracle Inventory User's Guide</i>.</p>
Planned Total Cost	The sum of planned production cost, planned carrying cost, planned purchasing cost, and planned transportation cost.

Column Heading	Description
Planned Revenue	<p>The estimated gross income for the plan from the sales of items that have an independent demand. The inventory planning engine calculates the revenue for each planned item that has an independent demand and aggregates the revenue at the plan level. The inventory planning engine calculates the revenue for an item by multiplying its selling price and the number of unit items supplied.</p> <p>The selling price for an item is specified in the List Lines tabbed region in the Price Lists window of Oracle Order Management. For more information, see <i>Oracle Order Management User's Guide</i>.</p> <p>The inventory planning engine calculates the number of units supplied based on the item's demand schedule. The demand schedule for an item is defined in the Organization tabbed region of the Plan Options window of Oracle Optimization. For information on demand schedule, see the section on demand schedules in <i>The Organizations</i>, page 3-9 Tabbed Region.</p>
Planned Gross Profit	The difference between the planned total cost and planned revenue for the plan.
Planned Gross Profit%	Planned gross profit divided by planned revenue and then multiplied by 100.
Inventory Value	<p>The estimated value of inventory at the end of the planning horizon. The inventory planning engine calculates the inventory value for each item in the plan and aggregates the value at the plan level. The inventory planning engine calculates the inventory value for an item by multiplying its projected available balance and its standard cost.</p> <p>You can view the projected available balance for items in the Horizontal Plan in Oracle Inventory Optimization. For more information see, <i>Oracle Advanced Planning Implementation and User's Guide</i>. The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
Plan	The name of the plans that you have selected for analysis.

Analyzing Postponement

Postponement is the positioning of materials across the supply chain. When you implement postponement, the level of completion of products gets delayed until you have a firm order. This delays the value addition to the materials and thus reduces the cost of the inventory and the carrying cost.

The inventory planning engine determines postponement based on the costs and lead times. However, the maximum level of postponement in the supply chain BOM is based on the value you enter for Profile Options MSR: Postponement factor. For more information on this profile option, see MSR Profile Options, page A-2. Set the value at 0 if you do not want to postpone.

You can analyze the effects of postponement using the Postponement Analysis page. You can view the carrying cost and inventory value with and without postponement in both graphical and tabular formats. You can also view the savings made in carrying cost and inventory investment. The details displayed in the graphical and tabular formats are based on your search criteria. You can further drill down using the View By feature.

You can also select plans and navigate to the Safety Stock Analysis page to analyze the safety stock details. This provides an insight into how much of the planned items are stored in the finished goods stage. You can navigate to the Safety Stock Analysis page from the Postponement Analysis page to analyze the safety stock details for the same search criteria.

You can also navigate to the Planner Workbench from the Postponement Analysis page to review supply and demand records for specific items. You can also look up the BOM and sourcing to figure out such things as parent items and related items and further analyze safety stocks.

To analyze postponement implementation:

Navigating to the Postponement Analysis page



Steps:

1. From the Analysis Workbench, click Postponement.

The Postponement Analysis page appears.

Postponement Analysis page

ORACLE Inventory Optimization Diagnostics Close Window Preferences Personalize Page

Postponement Analysis Profit Postponement Safety Stock Budget Revenue and Cost Service Levels

Indicates required field Workbench Printable Page

Search

▼ Hide Search

Plan 79% Org Category View By Plan

Display using Preference Set Create/Edit Save As Default Go

TIP Select one or more plans and drilldown

79% Safety Stock

▼ Hide Graph

☒ Safety Stock Carrying Cost - No Postponement

☐ Safety Stock Carrying Cost

☐ Safety Stock Carrying Cost Savings

Safety Stock Carrying Cost Breakdown

Planned Cost

79% Org or Category

☒ Safety Stock Inventory Value - No Postponement

☐ Safety Stock Inventory Value

☐ Safety Stock Inventory Value Savings

Safety Stock Inventory Value Breakdown

Planned Cost

79% Org or Category

▼ Hide Table

Plan	Safety Stock Carrying Cost - without Postponement	Safety Stock Carrying Cost - with Postponement	Safety Stock Carrying Cost Savings	Safety Stock Inventory Value - without Postponement	Safety Stock Inventory Value - with Postponement	Safety Stock Inventory Value Savings
79%	0	0	0	0	0	0
Total	0	0	0	0	0	0

Workbench Printable Page

Profit | Postponement | Safety Stock | Budget | Revenue and Cost | Service Levels | Diagnostics | Close Window | Preferences | Personalize Page
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2. Use the information in the following table to complete the fields in the Postponement Analysis page:

Field	Description
Plan	Search and select the inventory plans that you want to analyze. Click Save As Default to make the details selected in the Search Criteria as default in this page. The selected search criteria appear automatically every time you navigate to this analysis page.
Org	Optionally, search and select an organization to analyze its postponement details.
Category	Optionally, search and select a category to analyze its postponement details.

Field	Description
View By	<p>Select a view by to drill down. You can view by plan, organization, category, period, week, and plan-organization-category.</p> <p>You can view month-wise postponement details for either the manufacturing calendar or financial calendar by selecting period from the list.</p> <p>You can view week-wise postponement details only for the manufacturing calendar. You can select the type of calendar in the preference set created for the Postponement Analysis page.</p> <p>For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2.</p>
Display using Preference Set	<p>Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2.</p>

3. Click Go to analyze the postponement implementation for the selected plans.

The inventory planning engine displays the postponement details for the selected plans. The following table describes the column headings of the tabular display in the Postponement Analysis page:

Column Heading	Description
Plan	The name of the plans that you have selected for analysis.
Org	The organizations in the selected plans whose postponement details are displayed. This column appears if you are viewing by organization or plan-organization-category.
Category	The categories in the selected plans whose postponement details are displayed. This column appears if you are viewing by category or plan-organization-category.
Time	The bucket for which the postponement details are displayed. This column appears if you are viewing by period or week.

Column Heading	Description
Safety Stock Carrying Cost - without Postponement	The carrying cost for the safety stock without considering postponement. The inventory planning engine calculates the carrying cost based on the carrying cost percentage. You can set the carrying cost percentage at the item level or using a profile option. The carrying cost percentage set at the item level takes precedence over the carrying cost set using profile option. For more information on setting carrying cost percentage at the item level, see <i>Oracle Inventory User's Guide</i> .
Safety Stock Carrying Cost - with Postponement	The carrying cost for the safety stock considering postponement.
Safety Stock Carrying Cost Savings	The amount of money saved in carrying cost by implementing postponement. The inventory planning engine calculates this by subtracting the safety stock carrying cost with postponement from safety stock carrying cost without postponement.
Safety Stock Inventory Value-without Postponement	<p>The value of the safety stock without postponement. The inventory planning engine calculates the value of safety stock for an item by multiplying the item's projected available balance and standard cost.</p> <p>You can view the projected available balance for items in the Horizontal Plan in Oracle Inventory Optimization. For more information see, <i>Oracle Advanced Planning Implementation and User's Guide</i>. The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
Safety Stock Inventory Value-with Postponement	The value of the safety stock considering postponement.
Safety Stock Inventory Value Savings	The amount of money that can be saved by implementing postponement. The inventory planning engine calculates this by subtracting the safety stock inventory value with postponement from the safety stock inventory value without postponement.

Analyzing Safety Stocks

Safety stocks act as a buffer against unforeseen fluctuations in demand. The inventory planning engine calculates the achievable and target safety stocks for an inventory plan based on the plan inputs. You can use the Analysis Workbench to analyze and view the safety stocks at the aggregate and detail levels. Analysis of safety stocks helps you verify if specific items, item categories, and customers are adequately buffered against uncertainty in demand and supply.

You can analyze the safety stocks of multiple plans using the Safety Stock Analysis page. You can view the achievable, target, and user-specified safety stocks in units, value, and days of supply. The Safety Stock Analysis page also enables you to analyze the corresponding target and achievable service levels. This provides an insight into the effect of service levels on safety stock levels.

The Safety Stock folder in the analysis workbench displays the percent (%) contribution from each source of variability (demand, manufacturing lead time, in-transit lead time and supplier lead time variability) to the safety stock.

		10-Jan-2011		07-Feb-2011		14-Mar-2011		11-Apr-2011		09-May-2011	
		95%-SL	95%-SL+LTV	95%-SL	95%-SL+LTV	95%-SL	95%-SL+LTV	95%-SL	95%-SL+LTV	95%-SL	95%-SL+LTV
SCP:M1	Projected Safety Stock (Units)	667	705	667	705	667	705	938	976	938	982
	- Manufacturing Variability (%)	0	5	0	5	0	5	0	5	0	6
	- Supplier Variability (%)	0	6	0	6	0	6	0	5	0	5
	- Intransit Lead Time Variability (%)	0	7	0	7	0	7	0	5	0	5
	- Demand Variability (%)	100	82	100	82	100	82	100	86	100	84
	Target Service Level (%)	95	95	95	95	95	95	95	95	95	95
SCP:M2	Projected Safety Stock (Units)	0	0	265	430	265	430	265	430	265	430
	- Manufacturing Variability (%)	0	0	0	23	0	23	0	23	0	23
	- Supplier Variability (%)	0	0	0	28	0	28	0	28	0	28
	- Intransit Lead Time Variability (%)	0	0	0	0	0	0	0	0	0	0
	- Demand Variability (%)	0	0	100	49	100	49	100	49	100	49
	Target Service Level (%)										

The inventory planning engine can suggest postponement for your plans so that the safety stocks are stored at lower levels of the supply chain BOM. You can navigate to the Postponement Analysis page from the Safety Stock Analysis page to analyze the postponement details for the same search criteria. To analyze the postponement details for the same search criteria specified in the Safety Stock Analysis page, select the inventory plans from the list and click Postponement.

TIP Select one or more plans and drilldown

79%

Safety Stock

The inventory planning engine displays the safety stock and service level details in bar graph format and in the line graph format. You can also choose the type of bar or line graph such as dual-Y, split dual-Y, and stack.

Hide Results

Tools View Layout

Crosstab Graph Bar Bar Go

The chart displays the frequency of different device types across six categories (P1 to P6). The Y-axis represents the frequency, ranging from 0 to 3,500. The X-axis shows the categories: P1 79%, P2 79%, P3 79%, P4 79%, P5 79%, and P6 79%. The legend lists 24 categories, all starting with 'AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...'. The categories are grouped by device type (P1 to P6) and frequency (79%).

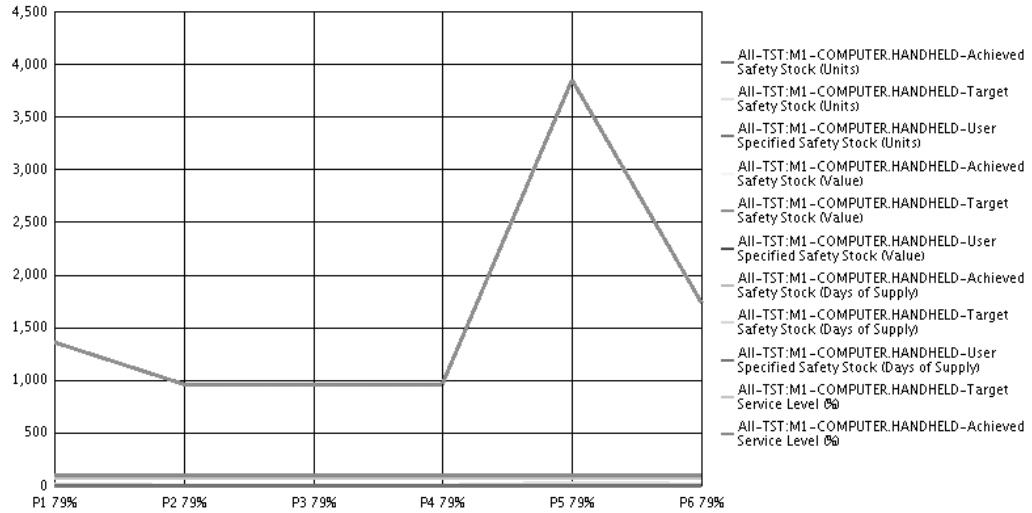
Category	P1 79%	P2 79%	P3 79%	P4 79%	P5 79%	P6 79%
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	1150	750	750	750	3150	1350
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-A...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-U...	150	150	150	150	150	150
AII-TST:M1-COMPUTER.HANDHELD-AS66312-T...	150	150	150	150		

Safety stock analysis in the line graph format

▼ Hide Results

▼ Tools View Layout

○ Crosstab ○ Graph Line Line Go



You can use the Layout link and the View By field for drilling down in the tabular display. For example if you choose Org/Category/Item in the View By field, then you can drill down from the organization level to the category level and then to the item level as shown in the following figure.

Drilling down in the tabular display

▼ Hide Results
▼ Tools View Layout

View by

				► P1:21-Jul-2003	P2:18-Aug-2003	P3:22-Sep-2003	P4:2
				79%	79%	79%	
▼ All	▼ TST:M1	▼ COMPUTER,HANDHELD	AS86312	Achieved Safety Stock (Units)	0.00	0.00	0.00
				Target Safety Stock (Units)	0.00	0.00	0.00
				User Specified Safety Stock (Units)	0.00	0.00	0.00
				Achieved Safety Stock (Value)	0.00	0.00	0.00
				Target Safety Stock (Value)	0.00	0.00	0.00
				User Specified Safety Stock (Value)	0.00	0.00	0.00
				Achieved Safety Stock (Days of Supply)	0.00	0.00	0.00
				Target Safety Stock (Days of Supply)	0.00	0.00	0.00
				User Specified Safety Stock (Days of Supply)	0.00	0.00	0.00
				Target Service Level (%)	79.00	79.00	79.00
				Achieved Service Level (%)	100.00	100.00	100.00
			AS86313	Achieved Safety Stock (Units)	0.00	0.00	0.00
				Target Safety Stock (Units)	0.00	0.00	0.00
				User Specified Safety Stock (Units)	0.00	0.00	0.00
				Achieved Safety Stock (Value)	0.00	0.00	0.00
				Target Safety Stock (Value)	0.00	0.00	0.00
				User Specified Safety Stock (Value)	0.00	0.00	0.00
				Achieved Safety Stock (Days of Supply)	0.00	0.00	0.00
				Target Safety Stock (Days of Supply)	0.00	0.00	0.00
				User Specified Safety Stock (Days of Supply)	0.00	0.00	0.00
				Target Service Level (%)	79.00	79.00	79.00
				Achieved Service Level (%)	100.00	100.00	100.00

To analyze safety stocks:

Steps:

1. From the Analysis Workbench, click Safety Stock.

The Safety Stock Analysis page appears.

Safety Stock Analysis page

ORACLE Inventory Optimization

Diagnostics Close Window Preferences Personalize Page

Profit Postponement **Safety Stock** Budget Revenue and Cost Service Levels

* Indicates required field

Safety Stock Analysis

Search Criteria

▼ Hide Search

* Plan 79% Org Category

Item Customer Customer Class

☐ Long Date Labels Display using Preference Set

✓ TIP Select one or more plans and drilldown

79% Postponement

▼ Hide Results

▼ Tools View Layout

☒ Crosstab ☐ Graph Bar

				P1	P2	P3	P4	P5	P6
				79%	79%	79%	79%	79%	79%
▼ All ▼ TST:M1 ► COMPUTER.HANDHELD	Achieved Safety Stock (Units)			7	5	5	5	20	9
	Target Safety Stock (Units)			7	5	5	5	20	9
	User Specified Safety Stock (Units)			0	0	0	0	0	0
	Achieved Safety Stock (Value)			1,357	964	964	964	3,854	1,730
	Target Safety Stock (Value)			1,357	964	964	964	3,854	1,730
	User Specified Safety Stock (Value)			0	0	0	0	0	0
	Achieved Safety Stock (Days of Supply)			0	0	0	0	0	0
	Target Safety Stock (Days of Supply)			0	0	0	0	0	0
	User Specified Safety Stock (Days of Supply)			0	0	0	0	0	0
	Target Service Level (%)			79	79	79	79	79	79
	Achieved Service Level (%)			100	100	100	100	100	100

Profit | Postponement | **Safety Stock** | Budget | Revenue and Cost | Service Levels | Diagnostics | Close Window | Preferences | Personalize Page

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2. Use the information in the following table to complete the fields in the Safety Stock Analysis page:

Field	Description
Plan	Search and select the inventory plans that you want to analyze. Click Save As Default to make the details selected in the Search Criteria as default in this page. The selected search criteria appear automatically every time you navigate to this analysis page.
Org	Optionally, search and select an organization to analyze its safety stocks.
Category	Optionally, search and select a category to analyze its safety stocks.

Field	Description
Item	Optionally, search and select an item to analyze its safety stocks.
Customer	Optionally, search and select a customer to analyze the customer's safety stocks.
Customer Class	Optionally, search and select a customer class to analyze its safety stocks.
Long Date Labels	Select this check box to the display the starting date of the periods in the tabular and graphical displays.
Display using Preference Set	Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2. You can specify the safety stock and service level details that you want to view when you create the preference sets for Safety Stock Analysis page.
Crosstab	To view this option, click the View link. Select this option to view the safety stock details in the tabular format.
Graph	To view this option, click the View link. Select this option to view the safety stock details in the graphical format. You can also specify the type of graph.
View By	To view this field, click the Layout link. Select a view by from the list to drill down in the tabular format.

3. Click Go to analyze the safety stocks for the selected plans.

The inventory planning engine displays the safety stock details for the selected plans in the tabular or graphical format based on your selection. The following table describes the row headings of the tabular display in the Safety Stock Analysis page:

Row Heading	Description
Achieved Safety Stocks (Units)	The achievable safety stock level in number of units calculated by the inventory planning engine. The inventory planning engine calculates this value based on the plan inputs.

Row Heading	Description
Target Safety Stocks (Units)	The safety stock level in number of units recommended by the inventory planning engine to meet a specific service level. For more information on target safety stocks, see <i>Safety Stock and Target Safety Stock</i> , page 5-10.
User Specified Safety Stock (Units)	The safety stock level in number of units specified by you. The user specified safety stock level overrides the target safety stock level. You can specify this value in Safety Stock window in the Planner Workbench. For more information, see <i>User-Specified Safety Stock</i> , page 7-5.
Achieved Safety Stocks (Value)	<p>The currency value of the achievable safety stock level. The inventory planning engine calculates this value by multiplying the number of unit items in the achievable safety stock and the standard cost of an item.</p> <p>The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
Target Safety Stocks (Value)	<p>The currency value of the target safety stock level. The inventory planning engine calculates this value by multiplying the number of unit items in the target safety stock and the standard cost of an item.</p> <p>The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
User Specified Safety Stock (Value)	<p>The currency value of the user specified safety stock level. The inventory planning engine calculates this value by multiplying the number of unit items in the user specified safety stock and the standard cost of an item.</p> <p>The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
Achieved Safety Stocks (Days of Supply)	The number of days for which the achievable safety stock level can meet the demand. For information how the inventory planning engine calculates the days of supply, see <i>Safety Stock Level Days of Supply</i> , page 7-4.

Row Heading	Description
Target Safety Stocks (Days of Supply)	The number of days for which the target safety stock level can meet the demand. For information on how the inventory planning engine calculates the days of supply, see Safety Stock Level Days of Supply, page 7-4.
User Specified Safety Stock (Days of Supply)	The number of days for which the user specified safety stock level can meet the demand. For information how the inventory planning engine calculates the days of supply, see Safety Stock Level Days of Supply, page 7-4.
Achieved Service Level (%)	The achievable service level for a plan. The inventory planning engine calculates the attained service level based on the inputs for the plan.
Target Service Level (%)	The target service level that you have set. You can set the target service level at various levels such as plan, organization, and item. For more information on setting target service levels, see Setting Target Service Levels, page 4-2.

Analyzing Inventory Budgets

Inventory budget is the maximum amount to be spent on inventory during a planning period. You can analyze your inventory plans to ensure that the budget has been allocated in the best way possible to achieve the desired service levels and profits. You can also verify if adequate budgets have been allocated to specific organizations and item categories. Analysis of your inventory budgets also enables you to know the corresponding inventory value for a budget amount.

Note: You can use the Planner Workbench to analyze budgets at the item level.

You can analyze the budgets and the corresponding inventory value and service level details of multiple plans using the Inventory Budget Analysis page. You can view these details in a time-phased format both on a monthly and weekly basis.

You can also widen the scope of your budget analysis by navigating to other related pages from the Inventory Budget Analysis page. This enables you to analyze the selected plans with the same search criteria specified in the Inventory Budget Analysis page. You can select the plans from the list and navigate to the following analysis pages from the Inventory Budget Analysis page:

- Revenue and Cost Breakdown
- Service Level Breakdown
- Service Level versus Profit Analysis
- Safety Stock Analysis

Navigating to other related analysis pages



You can view time-phased inventory budget details of your inventory plans in both tabular and graphical formats. You can specify the details that you want to be displayed using the preference sets that you have created for the Inventory Budget Analysis page. You can specify these details under Display Measures in the Preferences page of the Inventory Budget Analysis page. You can also choose the type of calendar, manufacturing or financial, in the preferences set. For more information, see the section on creating and editing preference sets in *Analyzing Inventory Plans*, page 6-2. The details displayed in the tabular and graphical formats are also based on your search criteria. You can further drill down using the View By feature.

The inventory planning engine displays the budget details in the bar graph format and in the line graph format. You can also choose the type of bar or line graph such as dual-Y, split dual-Y, and stack.

You can use the View By field for drilling down in the tabular display. For example if you choose Category/Org/Plan in the View By field, then you can drill down from the category level to the organization level and then to the plan level.

To analyze inventory budgets:

Steps:

1. From the Analysis Workbench, click Budget.
The Inventory Budget Analysis page appears.
2. Use the information in the following table to complete the fields in the Inventory Budget Analysis page:

Field	Description
Plan	<p>Search and select the inventory plans that you want to analyze.</p> <p>Click Save As Default to make the details selected in the Search Criteria as default in this page. The selected search criteria appear automatically every time you navigate to this analysis page.</p>
Org	Optionally, search and select an organization to analyze its inventory budget.
Category	Optionally, search and select a category to analyze its inventory budget.
Item	Optionally, search and select an item to analyze its inventory budget.
ABC Class	Optionally, search and select an ABC Class to analyze its inventory budget.
Long Date Labels	Select this check box to the display the starting date of the periods in the tabular and graphical displays.
Display using Preference Set	Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2. You can specify the budget details that you want to be displayed using the preference sets. You can also choose the type of calendar for the tabular and graphical displays using the preference sets.
Crosstab	To view this option, click the View link. Select this option to view the safety stock details in the tabular format.
Graph	To view this option, click the View link. Select this option to view the safety stock details in the graphical format. You can also specify the type of graph.
View By	To view this field, click the Layout link. Select a view by to drill down in the tabular format.

3. Click Go to analyze the inventory budgets for the selected plans.

The inventory planning engine displays the budget details for the selected plans in the tabular or graphical format based on your selection.

The following table describes the row headings of the tabular display:

Row Heading	Description
Budget	The allocated budget for a plan. The budget value can be specified in the Constraints tabbed region of Plan Options window or in the Specify Budget window. For more information on budgets, see <i>Defining Budgets</i> , page 4-12.
Inventory Value	<p>The estimated value of inventory at the end of each planned bucket. The inventory planning engine calculates the inventory value for each item in the plan and aggregates the value at the category, organization, and plan level. The inventory planning engine calculates the inventory value for an item by multiplying its projected available balance and its standard cost.</p> <p>You can view the projected available balance for items in the Horizontal Plan in Oracle Inventory Optimization. For more information see, <i>Oracle Advanced Planning Implementation and User's Guide</i>. The standard costs for items are specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>.</p>
Difference	The difference between the budget amount and the inventory value amount. The inventory planning engine calculates this difference by subtracting the inventory value from the budget.
Cum. Diff.	The collective difference between the budget amount and the inventory value. The inventory planning engine calculates the cumulative difference by adding the difference amount from the previous columns in the tabular display.
Target Service Level (%)	The target service level that you have set for a plan. You can set the target service level for a plan in the Constraints tabbed region of the Plan Options window. For more information on setting target service levels, see <i>Setting Target Service Levels</i> , page 4-2.
Achieved Service Level (%)	The achievable service level for a plan. The inventory planning engine calculates the achieved service level based on the inputs for the plan.

Analyzing Revenue and Cost Breakdown

There is a cost involved in achieving the service levels and safety stocks that you specify in your inventory plans. To determine the most profitable inventory plan, you need to know the cost that can be incurred and the revenue that can be generated by implementing a plan. You can analyze the cost and revenue details of your inventory plans using the Revenue and Cost Breakdown page. This analysis helps you identify how the allocated budget will be spent and how much revenue can be generated by implementing an inventory plan. This analysis helps you identify the most profitable organizations, item categories, and items in your inventory plan. This analysis also enables root cause analysis. For example, if achieving a specific service level costs an excessive amount of money, you can drill down to the categories or items contributing to the high costs using the Revenue and Cost Breakdown page.

The Revenue and Cost Breakdown page enables you to view the revenue and cost breakdown in both the tabular and graphical formats. The details displayed in these formats are based on your search criteria. You can further drill down using the View By feature. The graphical format shows the planned cost against an organization, category, or item in the plan.

You can also widen the scope of your analysis by navigating to other related pages from the Revenue and Cost Breakdown page. This enables you to analyze the selected plans with the same search criteria specified in the Inventory Budget Analysis page. You can select the plans from the list and navigate to the following analysis pages from the Revenue and Cost Breakdown page:

- Inventory Budget Analysis
- Safety Stock Analysis

Navigating to other related analysis pages

.....
✓ **TIP** Select one or more plans and drilldown



You can also navigate to the Planner Workbench from the Revenue and Cost Breakdown page by clicking Workbench to view supply and demand information along with sourcing and BOM information.

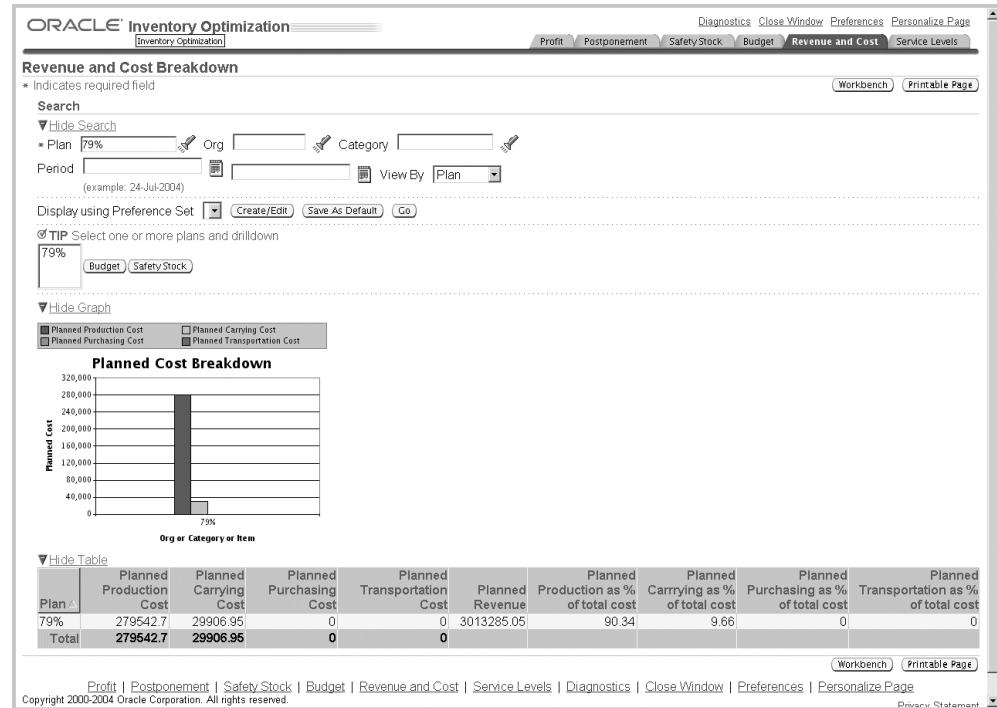
To analyze revenue and cost breakdown

Steps:

1. From the Analysis Workbench, click Revenue and Cost.

The Revenue and Cost Breakdown page appears.

Revenue and Cost Breakdown page



2. Use the information in the following table to complete the fields in the Revenue and Cost Breakdown page.

Field	Description
Plan	Search and select the inventory plans that you want to analyze. Click Save As Default to make the details selected in the Search Criteria as default in this page. The selected search criteria appear automatically every time you navigate to this analysis page.
Org	Optionally, search and select an organization to analyze its revenue and cost breakdown.
Category	Optionally, search and select a category to analyze its revenue and cost breakdown.

Field	Description
Period	Optionally, specify the period for which you want to analyze the revenue and cost breakdown. You can select the start and end dates from the date editor.
View By	<p>Select a view by to drill down. You can view by plan, category, item, period, or week.</p> <p>You can view month-wise revenue and cost breakdown detail for either the manufacturing or financial calendar by selecting period from the list.</p> <p>You can view week-wise details only for the manufacturing calendar. You can select the type of calendar in the preference set created for Revenue and Cost Breakdown page. For more information, see the section on creating and editing preference sets in Analyzing , page 6-2Inventory Plans.</p>
Display using Preference Set	Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2.

3. Click Go to analyze the selected inventory plans.

The inventory planning engine displays the revenue and cost breakdown details for the selected plans.

The following table describes the column headings of the tabular display in Revenue and Cost Breakdown page:

Column Heading	Description
Plan	The name of the plan that you have selected for analysis.
Category	The categories in the selected plans whose revenue and cost breakdown details are displayed. This column appears if you are viewing by category.
Item	The items in the selected plans whose revenue and cost breakdown details are displayed. This column appears if you are viewing by item.

Column Heading	Description
Time	The bucket for which the revenue and cost breakdown details are displayed. This column appears if you are viewing by period or week.
Planned Production Cost	<p>The estimated cost of producing the planned items. The inventory planning engine calculates the production cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the planned production cost for an item by multiplying the resource unit cost and the required hour. The resource unit cost and required hour for items are specified in Oracle Bills of Material. For more information, see the <i>Oracle Bills of Material User's Guide</i>.</p>
Planned Carrying Cost	<p>The estimated cost of stocking the planned items. The inventory planning engine calculates the carrying cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the carrying cost based on the carrying cost percentage. Carrying cost percentage can be set up at the item level using Oracle Inventory or at the profile option level. The carrying cost percentage set up at the item level takes precedence over the carrying cost percentage set up at the profile option level. For information on setting up carrying cost percentage at the item level, see <i>Oracle Inventory User's Guide</i>.</p>

Column Heading	Description
Planned Purchasing Cost	<p>The estimated purchasing cost for the planned items. The inventory planning engine calculates the purchasing cost for each item in the plan and aggregates the cost at the plan level.</p> <p>The inventory planning engine calculates the purchasing cost for an item based on its standard cost. The standard costs for items are specified in blanket purchase order agreement. These purchase orders are created in the Oracle Purchasing application. For more information, see <i>Oracle Purchasing User's Guide</i>.</p> <p>The standard costs for items can also be specified in the Oracle Cost Management application. For more information, see <i>Oracle Cost Management User's Guide</i>. The standard costs specified in Oracle Purchasing takes precedence over the standard costs specified in Oracle Cost Management.</p>

Column Heading	Description
Planned Transportation Cost	<p>The estimated cost for transporting the planned items from an organization to another. The inventory planning engine calculates the transportation cost for each item in the plan and aggregates the cost at the plan level. The inventory planning engine calculates the transportation cost for an item by multiplying the number of unit items supplied, unit weight or unit volume, and transportation cost per unit weight or unit volume.</p> <p>The inventory planning engine calculates the number of units supplied based on the item's demand schedule. It takes the organization name from which the item is sourced and the organization name to which the item is supplied from the item's sourcing rule. It also takes the shipment method from the sourcing rule.</p> <p>The inventory planning engine takes the unit weight or unit volume for the item and the cost of transporting an unit weight or unit volume of the item between the two organizations by the specified shipping method from Oracle Inventory.</p> <p>Unit weight or unit volume for an item is specified in the Physical Attributes tabbed region of Master Items window or Organization Items window of Oracle Inventory. The cost of transporting a unit weight or unit volume between two organization using a specific shipping method is specified in the Transit window of Oracle Inventory.</p> <p>For information on demand schedule, see the section on demand schedules in The Organizations Tabbed Region, page 3-9. For information on sourcing rules, see <i>Oracle Advanced Planning Implementation and User's Guide</i>. For information on transportation cost per unit weight or unit volume of an item, see <i>Oracle Inventory User's Guide</i>.</p>

Column Heading	Description
Planned Revenue	<p>The estimated gross income for the plan from the sales of items that have an independent demand. The inventory planning engine calculates the revenue for each planned item that has an independent demand and aggregates the revenue at the plan level. The inventory planning engine calculates the revenue for an item by multiplying its selling price and the number of unit items supplied.</p> <p>The selling price for an item is specified in the List Lines tabbed region in the Price Lists window of Oracle Order Management. For more information, see <i>Oracle Order Management User's Guide</i>.</p> <p>The inventory planning engine calculates the number of units supplied based on the item's demand schedule. The demand schedule for an item is defined in the Organization tabbed region of the Plan Options window of Oracle Optimization. For information on demand schedules, see the section on demand schedules in <i>The Organizations</i>, page 3-9 Tabbed Region.</p>
Planned Production as % of total cost	<p>The percentage of the production cost in the total cost.</p> <p>The inventory planning engine calculates this value by dividing the planned production cost by the total cost and then multiplying the result by 100. The total cost is the sum of the planned production cost, planned carrying cost, planned purchasing cost, and planned transportation cost.</p>
Planned Carrying as % of total cost	<p>The percentage of the carrying cost in the total cost.</p> <p>The inventory planning engine calculates this value by dividing the planned carrying cost by the total cost and then multiplying the result by 100. The total cost is the sum of the planned production cost, planned carrying cost, planned purchasing cost, and planned transportation cost.</p>
Planned Purchasing as % of total cost	<p>The percentage of the purchasing cost in the total cost.</p> <p>The inventory planning engine calculates this value by dividing the planned purchasing cost by the total cost and then multiplying the result by 100. The total cost is the sum of the planned production cost, planned carrying cost, planned purchasing cost, and planned transportation cost.</p>

Column Heading	Description
Planned Transportation as % of total cost	<p>The percentage of the transportation cost in the total cost.</p> <p>The inventory planning engine calculates this value by dividing the planned transportation cost by the total cost and then multiplying the result by 100. The total cost is the sum of the planned production cost, planned carrying cost, planned purchasing cost, and planned transportation cost.</p>

Analyzing Service Level Breakdown

Service level is the percentage of meeting your customers' requirements through your finished-goods inventory. Inventory Optimization enables you to specify service levels at various levels such as plan, demand class, organization, and item. The inventory planning engine calculates the achievable service levels based on the plan inputs.

You can analyze the service level breakdown of your inventory plans using the Service Level Breakdown page. This analysis helps you view the achievable service levels at the various levels for an inventory plan. This enables you to view the achievable service levels for your most profitable organization, demand class, item, and item categories. This analysis also enables root cause analysis. For example, if there is a service level violation, you can drill down to the items for which the achievable service level is lower than the targeted service level. Further you can navigate to the Safety Stock Analysis page to find out if the user-specified safety stocks or the calculated safety stock values are causing service level violation.

The Service Level Breakdown page enables you to view the service level breakdown details in both the tabular and graphical formats. The details displayed in these formats are based on your search criteria. You can further drill down using the View By feature. The graphical format shows the planned service level against an item, category, or organization.

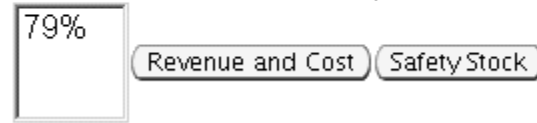
You can also widen the scope of your analysis by navigating to other related pages from the Service Level Breakdown page. This enables you to analyze the selected plans with the same search criteria specified in the Service Level Breakdown page. You can select the plans from the list and navigate to the following analysis pages from the Service Level Breakdown page:

- Revenue and Cost Breakdown
- Safety Stock Analysis

Navigating to other related analysis pages

Display using Preference Set ps1 ▾ Creat

✓ **TIP** Select one or more plans and drilldown

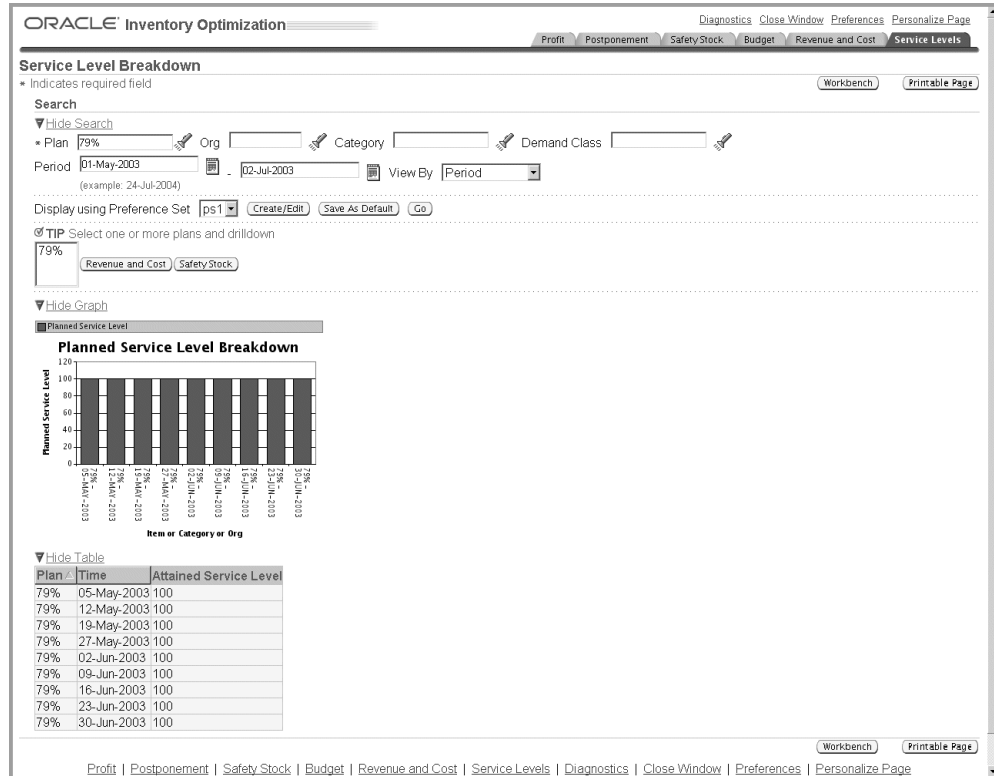


To analyze service level breakdown

Steps:

1. From the Analysis Workbench, click Service Levels.
The Service Level Breakdown page appears.

Service Level Breakdown page



- Use the information in the following table to complete the fields in the Service Level Breakdown page.

Field	Description
Plan	Search and select the inventory plans that you want to analyze. Click Save As Default to make the details selected in the Search Criteria as default in this page. The selected search criteria appear automatically every time you navigate to this analysis page.
Org	Optionally, search and select an organization to analyze its service level breakdown.
Category	Optionally, search and select a category to analyze its service level breakdown.

Field	Description
Demand Class	Optionally, search and select a demand class to analyze its service level breakdown.
Period	Optionally, specify the period for which you want to analyze the service level breakdown. You can select the start and end dates from the date editor.
View By	Select a view by to drill down. You can view by plan, category, item, period, week, or demand class.
Display using Preference Set	Optionally, select a preference set from the list. For more information, see the section on creating and editing preference sets in Analyzing Inventory Plans, page 6-2.

3. Click Go to analyze the selected inventory plans.

The inventory planning engine displays the service level breakdown details for the selected plans.

The following table describes the column headings of the tabular display in Service Level Breakdown page:

Column Heading	Description
Plan	The name of the plan that you have selected for analysis.
Category	The categories in the selected plans whose service level details are displayed. This column appears if you are viewing by category.
Item	The items in the selected plans whose service level details are displayed. This column appears if you are viewing by item.
Time	The bucket for which the service level details are displayed. This column appears if you are viewing by period or week.
Demand Class	The demand class in the selected plans whose service level details are displayed. This column appears if you are viewing by demand class.

Column Heading	Description
Attained Service Level	The achievable service level for a plan. The inventory planning engine calculates the attained service level based on the inputs for the plan.

Managing Inventory and Safety Stock

This chapter documents procedures for planning safety stock inventory.

This chapter covers the following topics:

- Planning Safety Stock for Components and Co-products
- Defining and Generating Safety Stock Levels
- Safety Stock Inflation
- Safety Stock Smoothing
- Safety Stock Level Days of Supply
- User-Specified Safety Stock

Planning Safety Stock for Components and Co-products

You can get multiple assemblies when processing a component. Oracle Inventory Optimization considers the combined variability of such end items to calculate safety stock quantities for common components. This reduces the required safety stock levels.

You can specify the time-phased split for product ratios (co-products).

Oracle Inventory Optimization also calculates safety stock quantities based on statistically calculated demand variability for all nodes across the supply chain bill. Based on the independent demand probability distributions across the bill of distribution, the inventory planning engine generates appropriate levels of safety stock at different levels of supply chain bill.

Defining and Generating Safety Stock Levels

The following steps indicate the process of defining and generating safety stock levels for common components of independent end items along with their components across the supply chain bill:

- Define the bills of material in the Bills of Material form.

- In the case of multiple components, define the bill of materials for the item and the multiple components.
- Define the co-product and the split percentage in the Define Co-products form.
- Define the alternate split percentages for different time periods in the Define Co-product form.
- Collect the co-products definition to Oracle Advanced Supply Chain Planning.
- Plan safety stock levels for all eligible items.

Safety Stock Inflation

You might see varying safety stock requirements across the planning horizon owing to the following reasons:

- Compressed lead time: The demands in the beginning of the horizon have less lead time as compared to demands later in the horizon. As a result, you may see differing safety stocks across the horizon.
- Existing supply: If you have enough existing supply, you do not need safety stocks to cover uncertainty. As you start to consume existing supply, you need safety stocks later in the horizon. As a result, you may view varying safety stocks across the horizon.

Safety Stock Smoothing

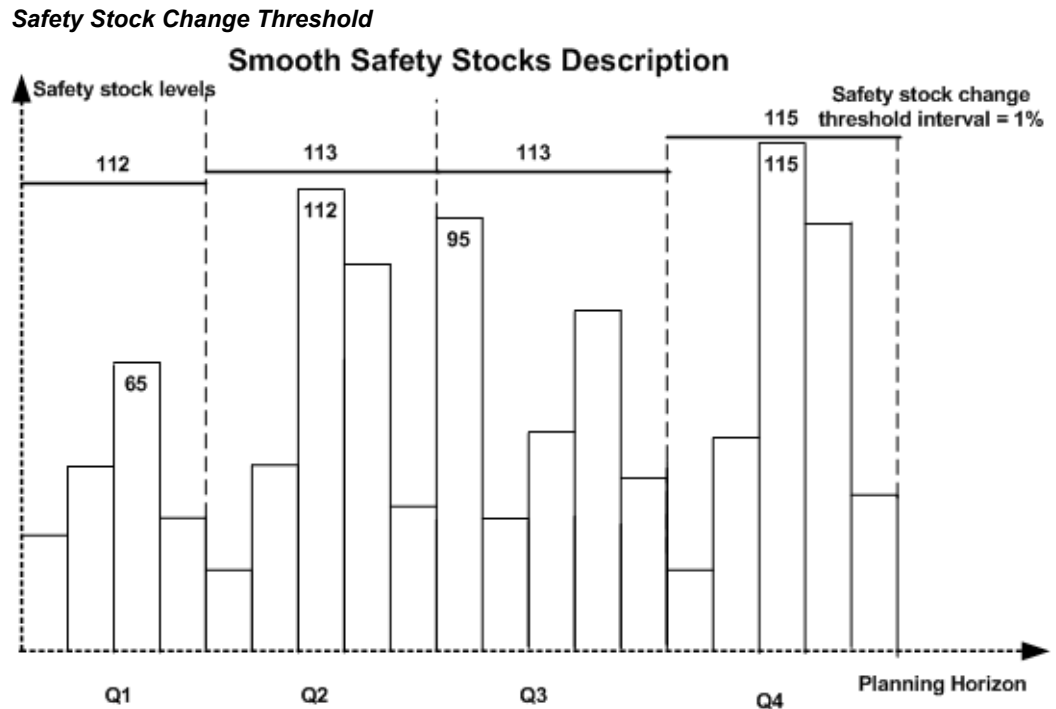
Oracle Inventory Optimization calculates time phased safety stock values across the planning horizon. However, there may be frequent changes to the safety stock if the demand variability is high. You may prefer estimating safety stock that is stable across the planning horizon. Oracle Inventory Optimization enables you to hold a constant safety stock for a specified time in the planning horizon. If you do not want the inventory planning engine to recommend any change in the safety stock for a specific duration, you can indicate the number of days. Oracle Inventory Optimization ignores the negative on-hand when it calculates the safety stock. The inventory planning engine considers the negative on-hand as an independent demand due in the first bucket.

You can use the following plan level options in the Plan Options window to control the stability of the safety stock:

- Safety stock change interval (days)
- Safety stock change threshold interval (%)

For more information on these plan level options, see Plan Options Overview, page 3-2.

Consider an example. In the following illustration, the vertical axis represents the safety stock level while the horizontal axis represents the planning horizon. In this example, planning horizon is split into 4 quarters. The safety stock change threshold interval is set to 1%.



The highest level of safety stock is indicated in the last change interval (Q4) at 115. The safety stock requirement in the adjacent interval is 95, which is lower than the requirement in Q4. This indicates that the safety stock quantity for Q3 needs to be reduced. As the safety stock change threshold interval is set to 1%, the inventory planning engine changes the safety stock levels at 113. The inventory planning engine reduces the stock from Q4 by a maximum of 1%. This amounts to 1.5, which leads to a reduction of 2 units. The inventory planning engine compares the safety stock requirements between the next adjacent quarters subsequently. In Q2, the safety stock required is 112. As 112 is within 1% of 113, the inventory planning engine does not change the safety stock levels. In Q1, the inventory planning engine recommends a reduction in the safety stock level by 1% of 112 (Q2).

Follow the steps provided to smoothen the safety stock:

- Review your inventory policy to determine the change interval.
- Divide the planning horizon into several equal sizes of change interval.
- Set the safety stock change interval in the Plan Options form.

- Determine the safety stock change threshold and specify the value in the Plan Options form.
- Run the plan and analyze the results.

Safety Stock Level Days of Supply

You can calculate your safety stock in terms of either absolute quantity or the days of supply. The days of supply refers to the number of days of demand that your safety stock can service. If you indicate the safety stock in terms of days of supply, you can compare inventory strategies across items (including groups of items) and plan accordingly.

The days of supply may include the inventory held to satisfy certain and uncertain demands. To calculate the days of supply, the inventory planning engine projects the safety stock value to the mean demand anticipated in future.

The following table displays buckets, the mean demand, and safety stock. Based on these values, the inventory optimization calculates the days of supply.

Bucket	Mean Demand	Safety Stock	Days of Supply
1	50	85	1.58
2	60	85	1.33
3	75	90	1.18
4	80	90	1.1
5	100	95	0.95

For example, on day 3, safety stock of 90 units is available. However, the mean demand is 75. The safety stock that remains after satisfying the mean demand is 15. This is used up against the mean demand on day 4. However, the mean demand on day 4 is 80. The inventory planning engine calculates the days of supply on day 3 as $1 + 15/80$. This equals 1.18.

If you plan in weekly or monthly buckets, the inventory planning engine calculates the days of supply in terms of days.

You can view the days of supply for safety stock, target safety stock, and user-specified safety stock in the horizontal plan. When you view your horizontal material plan, you can review the days of supply. You can change the safety stock value in the Material horizontal plan. However, you cannot change the days of supply in the horizontal plan. You can increase the safety stock quantity to avoid stockouts. You can use the updated

safety stock values in the supply plan to create supplies. For more information on the horizontal plan, see *Overview of Viewing Output*, page 5-1.

User-Specified Safety Stock

Several factors may influence your decision related to the level of safety stock that you need to maintain. These include:

- Contractual obligations
- Vendor-managed inventory
- Policies regarding service levels
- Subjective experience

The inventory planning engine recommends optimal levels of safety stock. However, you can override the recommendations that the inventory planning engine generates with your specific inputs.

You can use Oracle Inventory Optimization to specify a definite quantity for the safety stock in a time phased manner. Alternatively, you can specify the safety stock quantity in terms of days of supply. If you are uncertain about the definite safety stock quantity, you can specify the levels of inventory you want to maintain. The inventory planning engine validates the projected available balance against the inventory level that you specify.

If you enforce the level of safety stock based on your inputs, the inventory planning engine may need to violate constraints and other factors such as:

- Service levels
- Inventory postponement
- Budget and capacity

For example, you may have specified a budget constraint. If you enforce a certain level of safety stock that exceeds the budget limit, the inventory planning engine violates the budget constraint. Based on your specific safety stock requirements, you can estimate your budget and capacity requirements. In addition, you can calculate the planned service levels.

If you enforce user-specified safety stock, the inventory planning engine honors the user input and recommends the user-specified value rather than determining the optimal safety stock levels. To know the optimal safety stock levels, you can run a separate plan without enforcing user specified safety stock.

The user defined safety stock may violate the postponement suggestions that Oracle Inventory Optimization generates. Optimal inventory to be carried may be higher or lower than what the user would like to carry in some circumstances. In such a case,

safety stock values with and without postponement may not follow any logic as they may be affected by the user-specified safety stocks. Any associated costs will also be skewed based on safety stock numbers. In addition, the inventory planning engine can ignore the safety stock smoothing, and the minimum and maximum levels of inventory if you enforce the user-defined safety stock.

You can set the postponement factor profile option (MSR: Postponement Factor) to control the safety stock levels in a supply chain. The value you set for postponement factor might conflict with the user-specified safety stock. For example, you may input a safety stock value for an item four levels down in the supply chain and set postponement factor to be two. This will be considered an invalid setup. If you define both, the postponement factor and the user-defined safety stock, the inventory planning engine ignores the user-defined safety stock and enforces the postponement factor.

Setting Up User-Specified Safety Stock

Follow these steps to specify the safety stock level you want the inventory planning engine to use:

- Determine the items for which you need to specify the safety stock. You can run collections to collect the safety stock from the source instance. Review the safety stock for the items in the Planner Workbench. You can drill down to the safety stock value from the Items window in the Planner Workbench.
- Override the existing safety stock value with the value you want in the Safety Stock window (Planner Workbench). You can enter either an absolute quantity for the safety stock or the days of supply. If you enter the user-specified safety stock in terms of days of supply, the inventory planning engine converts the days of supply to a quantity based on the average demand quantity. When you enforce the user-specified safety stock, the inventory planning engine enforces the quantity calculated based on the average demand quantity. The enforced safety stock quantity may be different from the safety stock expressed in terms of the days of supply. Days of supply can be input to or output from the inventory planning engine. It is an input when you, as a user, specify the number of days you want the inventory to last. It is an output when the inventory planning engine expresses the optimal safety stock value in terms of days of supply. The input quantity specified as part of user specified safety stocks may not match the days of supply specified by the engine as the days of supply calculation is based on different statement of demands.
- Alternatively, you can set up the minimum or maximum inventory levels in the Inventory Levels window. If you provide an absolute quantity and the inventory level, the inventory planning engine considers the absolute quantity.
- Enforce the target safety stock by selecting the Enforce Target Safety Stocks check box in the Plan Options window.

- Run and evaluate the plan.

Viewing the User-Specified Safety Stock

You can view the user-specified safety stock in the horizontal plan (Planner Workbench). User-specified safety stocks are expressed in terms of units, days of supply, and value. If you specified the minimum or maximum inventory levels, the horizontal plan displays the values for the same.

For more information on viewing safety stock levels, see *Safety Stock and Target Safety Stock*, page 5-10.

Analyze the Impact of User-Specified Safety Stock

You can use the Analysis Workbench to analyze the impact of user-specified safety stock values on the existing budget, capacity, and inventory postponement. For more information on the analysis views, see *Analyzing Inventory Plans*, page 6-2.

Oracle Inventory Optimization and Asset Intensive Planning

Introduction to Asset Intensive Planning

The purpose of this functionality is to plan asset intensive maintenance to enable Oracle Inventory Optimization (IO) to compute safety stock for consumables and rebuildables that will be required for maintenance in an asset intensive industry.

Oracle Inventory Optimization (IO) sets safety stock levels that understand the holistic supply chain, including planning for maintenance of assets. The planning of maintenance of assets includes rebuilding defective items into a usable state to fulfill maintenance component demands. A complex asset, such as an aircraft, a vehicle, or manufacturing equipment contains components that are considered repairable or rebuildable.

IO provides an inventory postponement optimization solution that leads to a much more efficient supply chain, characterized by lower levels of inventory and better delivery performance to customers.

In order to support postponement and to accomplish the rebuild of defective items into a usable state, IO will rebuild activity bill of material and routing.

Process Overview

Rebuild activity, as defined in Oracle eAM, is recognized in IO. IO uses the bill of material and routing that is associated with this rebuild activity to understand which materials and resources are used in the repair process. This helps IO to compute safety stock for components used in the repair process, in addition to the repair item itself.

IO supports the definition of a "rebuild" activity, which is used to calculate the points of postponement. This activity is collected to support ASCP planning of maintenance requirements.

Rebuildable items (rebuildables) are assets that you install, remove, overhaul, and reinstall, for example, engines, control boxes, and computer boards. Other components

that you remove, discard, or replace are consumables

Maintenance activities, such as, inspections, overhauls, lubrications, repairs, servicing, and cleanings, are the templates of work orders. The activities have an activity structure —the material requirements (maintenance bill of material) and operations and resource requirements (activity routing) that you need to perform the maintenance. You associate the activities with assets.

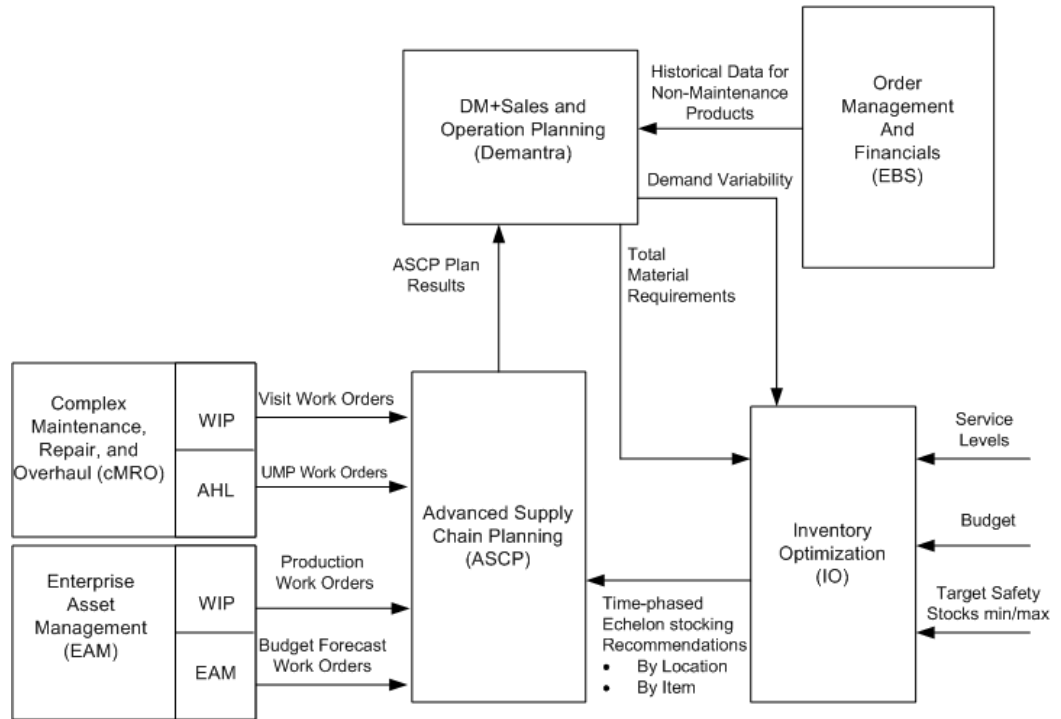
The rebuild activity tells IO which maintenance of asset and routing will be used for the maintenance of the asset. IO gets the repair lead times from the Item Attribute and respects it. In case no rebuild activity is specified for a component that has a repair sourcing rule specified, the repair lead time that is specified on the item attribute must be respected. This being the case where no Rebuild Activity has been specified, IO assumes that there are no additional components required to rebuild the defective part. The treatment here is identical to that of ASCP. For more details, refer to *Oracle Advanced Supply Chain Planning Implementation and User's Guide Supplement*.

The fact that items are being repaired or rebuilt implies that there are defective items in the supply chain. Inventory optimization will plan safety stocks only for usable items.

Computing Total Demand

Both eAM and cMRO maintenance applications produce a set of forecasted Maintenance Work Orders. These are collected into ASCP as a statement of forecasted maintenance activities and the associated material and resources requirements. These forecasted work orders are created based on the known condition and expected preventative maintenance schedule of each asset, such as aircraft, truck, metal press.

ASCP then produces a supply chain plan for these work orders that will be used by the Demantra Sales & Operations Planning (S&OP) process and combined with Demantra's traditional demand forecast for independent demand, based on historical sales orders. Demantra combines its sales order based forecast and with the forecasted work orders to create a single statement of total demand each item. This one number demand forecast is compared to actual historical demands to calculate the forecast accuracy, as shown in the diagram below:



Calculating Total Demand

Contained in the supply plan that is calculated by ASCP, there are two distinct maintenance supply order types:

- Maintenance Work Orders
- Planned Repair Work Orders

Maintenance Work Orders

Maintenance Work Orders contain the collected work orders from eAM and cMRO maintenance applications. The collected Maintenance Work Orders represent both near term scheduled work as well as future forecasted maintenance work. They include CMRO Visit Work Orders, CMRO Unit Maintenance Plan Repair Work Orders, eAM Work Orders and eAM Budget Forecast Work Orders. In addition Maintenance Work orders represent both maintenance (will have Produce to Stock of No) as well as repair (will have Product to Stock of Yes) These Maintenance Work Orders contain material requirements for both consumable and repairable components.

Planned Repair Work Orders

ASCP may recommend Planned Repair Orders to satisfy component demands, depending on the available or expected defective supply and other constraints.

Demantra will exclude the demands associated with Planned Repair Work Order since these will be accounted for by IO, which determines its postponement strategy:

1. Demantra will calculate "Total Demand" as the sum of:
 - Consensus Forecasted This is the forecast for non-maintenance products.
 - Maintenance Work Order Demand
2. Demantra will calculate Demand Variability by comparing the total demand" to actual demands

Demantra will send a statement of Total Demand and Demand Variability to IO, which will then use this information to calculate optimized safety stocks, based on user input of service level targets and budget.

Modeling Repair Operations

As part of the enhancements, ASCP can now model repair operations. Each maintenance application (eAM and cMRO) supports a repair or rebuild process to transform a defective item into a usable item to satisfy maintenance demands. Contained in each set of Work Orders are component requirements for Rebuildable items ASCP will recommend "supplies to satisfy"

To support its postponement functionality, IO must be cognizant of the "Rebuildable" BOM and Route utilized in these rebuild activities. Inventory Optimization recognizes the Repair-at sourcing rule.

For more information on Asset Intensive Planning and the role of ASCP, refer to *Oracle Advanced Supply Chain Planning Implementation and User's Guide Supplement*.

eAM Activity Definition

The activity shown below, Rebuild T56-Engine, is the process of transforming a defective T56-Engine in to a usable T56-Engine. The BOM and Routing associated with the item define the process. This example uses the T56 Engine to illustrate the modeling setups.

Master Item (V1)

Organization: V1 Vision Operations

Item: Rebuild T-56 Engine

Description: Rebuild T-56 Engine

Display Attributes: Master Qrg All

Main Inventory Bills of Material Asset Management Costing Purchasing Receiving Physical Attributes

Unit of Measure

Primary: Each

Tracking: Primary

Pricing: Primary

Secondary:

Defaulting:

Deviation Factor +: 0 %

Deviation Factor -: 0 %

Conversions

Standard

Item specific

Both

User Item Type: Rebuildable

Item Status: Active

Rebuilding the T56 Engine Activity

The activity "Rebuild T56-Engine" Maintenance BOM and Maintenance Routing are defined with the following values as part of standard eAM setup:

Bill of Materials

Item	Item Sequence	UOM	Quantity
Fuel Enrichment Valve	10	EA	1
Anti-Ice Valves	10	EA	0.5
Fuel Pump	20	EA	1
Compressor Bleed Valves	10	EA	1

Routing

Sequence	Description	Resource	UOM	Quantity
10	Rebuild Engine	Advanced A&P	Hour	32
20	Test Engine	Inspector	Hour	4

Item and Activity Identification

The Asset type of Rebuildable Inventory identifies the asset as a rebuildable asset. For rebuildable assets the Asset Group is synonymous with the Rebuildable Item.

The screenshot shows the 'Define Rebuildable Serial Number (EM1)' dialog box. The 'Asset Type' field is highlighted with a red box and contains the text 'Rebuildable Inventory'. Other fields include Asset Number (FLM1010), Asset Group (T-56 Engine), Asset Serial Number (FLM1010), Asset Category (Engine), Organization (EM1), and a 'Parent' section with Asset Type (Capital), Asset Number (FL1010), and Asset Group (Fork Lifts). There are also checkboxes for 'Maintainable', 'Active', and 'Operation Log Enabled', and a 'Warranty Expiration' field.

The Asset Group is setup as an inventory transactable item of the item type of Asset Group. The Asset Group is synonymous to an inventory item and is the item that is planned by ASCP.

Activity Types describe the type of maintenance work that is performed on an asset, such as, inspections, lubrications, overhauls, calibration, and repetitive work. The "Rebuild – Rebuild Spare" activity determines which activity that is associated with a rebuildable item should be used by ASCP to plan for the rebuild or repair of the rebuildable item. Activity types of Rebuild are those collected over into ASCP for use in generating planned repair work orders.

Note: eAM does not enforce the assignment of one and only one Rebuild Activity type for each rebuildable asset group. Since ASCP needs to identify a specific rebuild activity to use in planning purposes, there is an attribute set on the destination that specifies which of these multiple rebuild activities is used for planning. It is an implementation task and business rule to enforce to assignment of Rebuild activities to rebuildable asset groups. For example:

Activity Type	Description
Calibration	Calibration
Construction	Construction

Contracted	Contracted Services
Inspection	Inspection
Installation	Installation
Janitorial	Janitorial
Lubrication	Lubrication
Maintenance	Maintenance
Rebuild	Rebuild Spare
Reformat	Department Reformat
Reformat	Reformat
Repetitive	Repetitive
Replacement	Replacement
Service	Service

Repair Lead Time

The Repair lead time for the rebuild of each item must be specified as an item attribute or in the simulation set. Inventory Optimization reads in the repair lead time and considers the time that is required to rebuild the item.

IMM Rebuild Activity

The 'Rebuild Activity' is a new item attribute, but it is not available in ERP. It is a destination-only attribute and will be added to the Item Attribute Mass Maintenance (IMM) form. This attribute is populated with the Rebuild Activity setup in eAM as the Maintenance BOM and Routes that will be used to plan for the items rebuild process. This new IMM attribute needs to be set for each organization that is used in creating Planned Repair Work Orders as well as during the release process of these work Orders. IO looks at the rebuild activity to determine a rebuild BOM and routing.

Item Simulation Set Name: Industrial-SPP Description: Simset for Industrial flow

Scope: ☒ Organization ☐ Zone ☐ Customer Find Items: ☐ Included ☐ Not Included ☒ All Find

Items: ☐ Select All

Select	Item	Org	Flag	Original ATP Component	ATP Components Flag	Original Dem
<input type="checkbox"/>	00-AF10200	TST-AM1		None		
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						
<input type="checkbox"/>						

Item attributes available for update

Attribute Name	Condition	Attribute Value
Rebuild Activity	Set Value To	Fork Lift Rebuild

Cancel Apply Delete

Note: Oracle Inventory Optimization assumes that there are no additional components required to rebuild the defective part. The treatment here is identical to ASCP.

Note: Oracle Inventory Optimization will not use the existing Maintenance Work Orders and External Repair Orders as sources of supply computing safety stock

Note: Oracle Inventory Optimization will not have the dummy work order construct used in ASCP to model shut-down of eAM resources while they are being maintained since the impact on the safety stock calculation will be fairly limited.

Oracle Inventory Optimization Warehouse Capacity Constraints and Cycle Inventory Safety Stock

Oracle Inventory Optimization Warehouse Capacity Constraints

Oracle Inventory Optimization has added a new IO constraint set to implement warehouse capacity. These warehouse constraints are considered as hard constraints when combined with budget or capacity constraints. They are considered as soft constraints when combined with service level constraints. These constraints are defined either at the organization level or at the category org. level, depending on the value you specify for the profile option MSR: Warehouse Capacity Granularity.

Organization Level Constraints

The organization level Warehouse Capacity Constraint for an organization and each planning time buckets is calculated by taking into consideration the following criteria:

- The organization
- The item in the organization
- The number of projected available units of the item, as calculate by IO, and includes on hand, firm supplies, safety stock, and planned orders

Note: The number on had quantity is used if the plan option Net On Hand is implemented. The onhand quantity is not considered by the plan if Net On Hand is in its NULL default state.

- Item volume as specified in the Item Attributes Mass Maintenance window or in the Organization Item window

- Capacity for the organization as specified in the Organization Parameters window or uploaded via the TradingPartner.dat file
- Average Cycle Stock of the item

The Average Cycle Stock of the item is calculated by taking into account the following:

- Order quantity of the item, based on the item's demand adjusted for the item order modifiers.
- Order Period of the item as specified in the Item Attributes Mass Maintenance window.
- Average Daily Demand for an item during a planning bucket, as determined by summing up the item's demand over Safety Stock Days working days, starting with the planning bucket start date, and then dividing by Safety Stock Days. Safety Stock Days is an item attribute.
- Inventory Quantity Increment of the item, as determined by the average demand and the number of days represented by the Inventory Days Increment
- Inventory Days Increment of the item, as specified in the Item Attributes Mass Maintenance window. It may represent the number of days that supply of the item remains on hold for quality testing.

Order Quantity and Effects of Order Modifiers

The IO Planning engine considers the following item order modifiers when calculating Cycle Stock:

- FOQ: Fixed Order Quantity
- MIN: Minimum Order Quantity
- FLM: Fixed Lot Multiplier

If FOQ is defined for an item, then the system ignores the MIN and FLM order modifiers and sets the Order Quantity to FOQ:

Order Quantity = FOQ

If there is no FOQ, then the system calculates the order quantity based on the item's demand with respect to MIN and FLM:

A NULL value for MIN is considered as zero.

A NULL value for FLM is considered as 1

Safety Stock Push Down to Downstream Locations

The objective of warehouse capacity constraints is to minimize the total system inventory cost. To do this, the IO Postponement algorithm determines the safety stock levels at downstream warehouses as a result of restricted capacity at their upstream warehouse.

Example:

Consider items A and B at 3 inventory locations:

CP: Central Production Facility (Upstream)

DW1: Distribution Warehouse 1 (Downstream)

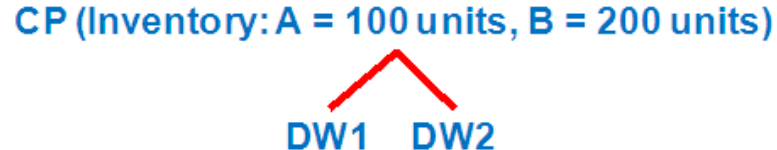
DW2: Distribution Warehouse 2 (Downstream)

Customer demands are satisfied from distribution warehouses.

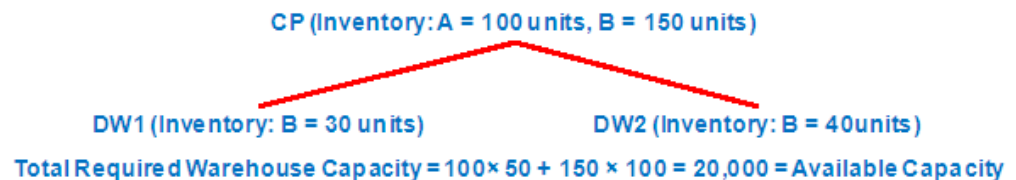
The item costs and unit volumes are:

- Cost: A = \$100/Unit, B = \$50/Unit
- Volume: A = 50 cu.ft/Unit, A = 100 cu.ft/Unit

Without any warehouse capacity constraints, the optimized inventory levels determined by IO for items A and B at Central Production Facility are:




With a total warehouse capacity of 20,000 cuft for the Central Production Facility (CP), the optimized inventory levels determined by IO for items A and B at each warehouse become:



Based on the warehouse capacity constraints, IO keeps the inventory of higher priced item (A) at the upstream location (CP) to minimize the inventory holding costs.

Item	Inventory Level Without Warehouse Capacity Constraints			Inventory Level With Warehouse Capacity Constraints		
	CP	DW1	DW2	CP	DW1	DW2
A	100	0	0	100	0	0
B	200	0	0	150	30	40



As shown in the above table, some of inventory of the lower priced item B is pushed down to downstream locations due to the warehouse capacity constraint at the upstream location.

The total inventory of item B is increased from 200 to 220 because IO can no longer use a single pool of inventory at CP warehouse to buffer against the uncertainty.

Specifying Warehouse Capacity Level

You can use instruct the system to constrain the IO plan with the total warehouse capacity or the storage capacities of different storage types within the warehouse.

To model the warehouse capacity granularity you can use a new profile option MSR: Warehouse Capacity Granularity. Valid values are:

- **Organization Level:** This allows you to constrain your plan by the total warehouse capacity of each warehouse. This is the default value.
- **Category Organization Level:** This allows you to constrain your plan by the storage capacities of different storage types within each warehouse.

Specifying Safety Stock Days

The "Safety Stock Days" is used in calculation of an item Average Daily Demand for each planning bucket, which is subsequently used in calculation of the item Average Cycle Stock.

Average Daily Demand for a Planning Bucket = Sum of item's independent and dependent demands from the start of the planning bucket to the Safety Stock Days working days after the start of the planning bucket, divided by Safety Stock Days.

You specify the Safety Stock Days at the item-org level in the Item Attributes Mass Maintenance window, in the Attribute Name field of the Item attributes available for update field.

Note: The Average Demand (AD) is calculated over the working days based on the Organization Manufacturing Calendar.

You then specify the Simulation Set with the desired values for the Order Modifiers or Safety Stock Days in the Plan Options window. Alternatively, you can define the Safety Stock Bucket Days in the General Planning tab of Oracle Inventory Master Item or Organization Item window.

Note: If you are an E1 user, you can specify this item attribute by populating the following parameter in the Item.dat file and then upload this file by means of the Legacy Collections:

SAFETY_STOCK_BUCKET_DAYS: This is the item Safety Stock Days.

Defining Item Order Modifiers

Specifying item order modifiers is very similar to specifying Safety Stock Day. Specify the item order modifiers at the item-org level in the Item attribute available for update field of the Item Attributes Mass Maintenance window, under Attribute Name. You then specify the Simulation Set with the desired values for the Order Modifiers or Safety Stock Days in the Plan Options window.

Alternatively you can define the item order modifiers in the General Planning tab of Oracle Inventory Master Item or Organization Item window.

The IO Planning engine considers the following item order modifiers for calculating the Average Cycle Stock:

- FOQ: Fixed Order Quantity
- MIN: Minimum Order Quantity
- FLM: Fixed Lot Multiplier

If FOQ is defined for an item, then the system ignores the MIN and FLM order modifiers and sets the Order Quantity to FOQ then $\text{Order Quantity} = \text{FOQ}$.

If there is no FOQ, then the system calculates the order quantity based on the item's demand with respect to MIN and FLM, then $\text{Order Quantity} = \text{Smallest Multiple of FLM} \geq \text{Maximum (MIN, Demand)}$.

A NULL value for MIN is considered as zero.

A NULL value for FLM is considered as 1.

Note: E1 users can define Fixed Order Quantity and Order Multiplier in E1 source and then upload these attributes to planning server via E1-VCP Integration. Alternatively E1 users can specify these item order modifiers by populating the following parameters in the Item.dat file and then upload this file via Legacy Collections
FIXED_ORDER_QUANTITY (the item Fixed Order Quantity) and
FIXED_LOT_MULTIPLIER (the item Fixed Lot Multiplier).

Specifying Order Period

The Order Period is the interval between orders. It is used in the calculation of the Average Cycle Stock as in the section Warehouse Capacity Constraints. The purpose of the Order Period is to allow the specification of an alternate order quantity that may be larger than the item's FOQ, MIN or FLM attributes. This allows the consideration of both production mechanics (e.g., must process 500 pounds = 1 container at a time) (by means of the item's order modifier attributes) and manufacturing operations constraints (e.g., must produce at least 3 week's worth of a product at a time) (by means of the Order Period) in determining an effective order quantity to be used for cycle stock calculation purposes.

You define the Order Period (OP) item attribute at the item-org level in the Item Attributes Mass Maintenance window in the same way as you defined Safety Stock Days and Order Modifiers.

Note: The attribute value for the Order Period is specified in working days based on the Organization Manufacturing Calendar.

Specifying Inventory Days Increment

The Inventory Days Increment is an item attribute, which can represent the number of days that supply of an item remains on hold for quality testing.

You define the Inventory Days Increment (IDI) attribute at the item-org level in the Item Attributes Mass Maintenance window in the same way as you defined Safety Stock Days and Order Modifier

Note: The attribute value for the Inventory Days Increment is specified in working days based on the Organization Manufacturing Calendar.

Defining Warehouse Capacity at the Organization Level

You define the total volume capacity available in a warehouse in the Inventory Parameters tab of the Organization Parameters window

The value of this field represents the warehouse capacity for the organization as specified in the Organization Parameters window or as uploaded by means of the Trading Partner.dat file.

The planning engine constrains the plan with the warehouse capacities at the org level when the profile option MSR: Warehouse Capacity Granularity is set to "Organization Level".

Note: There are no source fields in E1 for warehouse capacity volume and volume unit of measure. E1 users can specify warehouse capacity volume and its unit of measure by populating the following parameters in the TradingPartner.dat file and then upload this file by means of Legacy Collections MAXIMUM VOLUME (the warehouse capacity volume) and . VOLUME_UOM (the capacity volume unit of measure).

Defining Storage Capacity at the Category Level

To set up your system to define storage capacity at the category level, follow the steps below:

1. Define a category set and then define your storage types as categories in this category set. For example:
 - Category set: ABC
 - Category Set: Storage Type
2. Define your storage types as categories in this category set:
 - Category: Frozen
 - Category: Refrigerated
 - Category: Dry
 - Category: Other
3. Define capacities for your storage types, using the category set and categories defined in steps 1 and 2..

You can define the capacities for different storage types in a warehouse in the Storage Capacity window under the Setup menu for the Inventory Planner responsibility.

In the Storage Capacity window, you specify capacities for the categories in the category set defined in Step 1 above

You specify capacities for storage types in multiple warehouses (organizations) in the Storage Capacity window.

Note: You can only define one category set at a time for specifying storage capacity. This means that when you select a category set in the Storage Capacity window and define capacities, selecting another category set will replace the one previously defined.

For example, if you select category set ABC in the Storage Capacity window and define the storage capacity and then alter decide to specify storage capacity in category set DEF, the new definition of capacity in category set DEF replaces the previous definition of capacity in category set ABC. Therefore, there is a maximum of one record associated to the Storage Capacity window.

Note: If you try to save a new definition of capacity in a different category set, the systems alerts you with a pop-up window, which says "This action replaces storage capacities defined in category set <ABC> do you want to continue? You can respond by clicking the Yes or No button.

The planning engine constrains the plan with the warehouse capacities at the category org level when the profile option MSR: Warehouse Capacity Granularity is set to Category Organization Level.

Note: E1 users can utilize a user-configurable category code to define a Category Set for storage types. Each category code that comes over by means of E1-VCP integration becomes a Category Set, and the values that are held in that category code field for various items become the Categories. Subsequently these attributes can be uploaded to planning server via E1-VCP Integration. Alternatively E1 users can specify category sets and categories in the CategorySet.dat and Category.dat files and then upload these files via Legacy Collections.

Defining Item Volume

You specify the item volume and its unit of measure at the item-org level in the Item Attributes Mass Maintenance window. You then specify the Simulation Set with the desired values for the item volume in the Plan Options window.

Alternatively you can define the item volume in the Physical Attributes tab of Oracle Inventory Master Item or Organization Item window.

Note: E1 users can define item volume and item volume unit of measure in E1 source and then upload these attributes to planning server via E1-VCP Integration. Alternatively you can specify item volume and its unit of measure by populating the following parameters in the Item.dat file and then upload this file via Legacy Collections:

UNIT_VOLUME (the item volume and VOLUME_UOM (the item volume unit of measure).

Specifying the Enforce Warehouse Capacity Constraints Plan Option

You enforce warehouse capacity constraints by selecting the plan option Enforce Warehouse Capacity Constraints. The following table summarizes the IO engine behavior when the plan option Enforce Warehouse Capacity Constraints is checked. Note that Enforce Budget Constraints, Enforce Capacity Constraints and Enforce Service Level Constraints are all selected, as shown in *italics*.

Plan Level Constraints Status	Engine Behavior
Enforce Service Level Constraints	Warehouse capacity and budget are hard constraints
<i>Enforce Budget Constraints</i>	Warehouse capacity and budget are hard constraints
Enforce Capacity Constraints	Warehouse capacity and budget are hard constraints
Enforce Service Level Constraints	Warehouse, material, and resource capacities are hard constraints
Enforce Budget Constraints	Warehouse, material, and resource capacities are hard constraints
<i>Enforce Capacity Constraints</i>	Warehouse, material, and resource capacities are hard constraints
<i>Enforce Service Level Constraints</i>	Service levels are hard constraints. Warehouse capacities are soft constraints
Enforce Budget Constraints	Service levels are hard constraints. Warehouse capacities are soft constraints
Enforce Capacity Constraints	Service levels are hard constraints. Warehouse capacities are soft constraints

Warehouse Capacity Exceeded Exception

The warehouse capacity or the warehouse storage type capacities could be exceeded

above the available capacity when the Warehouse Capacity Constraints are considered as soft constraints by the planning engine. This can happen when the plan option Enforce Service Level Constraints is checked:

Plan Level Constraints Status	Engine Behavior
<i>Enforce Service Level Constraints</i>	Service levels are hard constraints. Warehouse capacities are soft constraints.
Enforce Budget Constraints	Service levels are hard constraints. Warehouse capacities are soft constraints.
Enforce Budget Constraints	Service levels are hard constraints. Warehouse capacities are soft constraints.

The generated exception is called "Warehouse Capacity Exceeded".

When the plan is constrained by the warehouse capacity at the org level, this exception is generated by organization and planning bucket. When the plan is constrained by the warehouse storage type capacity at the category org level, this exception is generated by organization, category, and planning bucket.

The Exception Details window displays the following fields:

- Exception: Warehouse capacity exceeded
- Organization
- Category: This field is blank if the plan is constrained by the warehouse capacity at the org level.
- Start Constraint Date
- End Constraint Date
- End Constraint Date
- Available Warehouse Capacity
- Load Ratio: This is the ration of Required Warehouse Capacity over Available Warehouse Capacity

Note: The exception is part of "Material and resource capacity" exception group.

Pushing Warehouse Capacity Facts to APCC

The Archive Plan Summary concurrent program is enhanced by adding the following facts and dimensions and pushing them to the APCC repository:

- Required Warehouse Capacity
- Available Warehouse Capacity
- Average Cycle Stock
- Dimensions
- Organization
- Category

Setting Up Warehouse Constraints

To set up IO warehouse constraints, follow the steps below:

1. Set up the profile option MSR: Warehouse Capacity Granularity
 - Organization level
 - Category Organization Level
2. Specify the "Safety Stock Days" at item-org level in the "Item Attributes Mass Maintenance" window (Alternatively you can define this attribute in Oracle Inventory Organization Item window, General Planning tab). This item attribute is used as the time horizon for calculating the Average Demand.
3. Specify item order modifiers at item-org level in the "Item Attributes Mass Maintenance" window (Alternatively you can define item order modifiers in Oracle Inventory Organization Item window, General Planning tab).
4. Specify the "Order Period" at item-org level in the Item Attributes Mass Maintenance window.
5. Specify the "Inventory Days Increment" at item-org level in the Item Attributes Mass Maintenance window.
6. Define the "Warehouse Volume Capacity" in Oracle Inventory (Organization Parameters window, Inventory Parameters tab). This is used if the "Organization Level: is selected in Step 1.
7. Define the storage capacities at the org category level in the "Storage Capacity"

window under the Setup menu for the Inventory Planner responsibility. The category level capacities are used if the "Category Organization Level: is selected in Step 1.

8. Define the item's "Unit Volume" and item's "Volume Unit of Measure" at item-org level in the "Item Attributes Mass Maintenance" window (Alternatively you can define these attributes in Oracle Inventory Organization Item window, Physical Attributes tab).
9. Enforce Warehouse Capacity Constraints in the Constraints tab of the Inventory Optimization Plan Options window.

Accounting for Cycle Inventory in Safety Stock Calculation

Introduction to Accounting for Cycle Inventory in Safety Stock Calculation

Enabling Cycle Stock Functionality

To enable the ability to calculate safety stock with respect to cycle stock you need to set the profile option MSR: Include Cycle Inventory in Safety Stock Calculations in your personal profile values. Valid values are:

- Yes: Calculate safety stock using cycle stock
- No (default): Do not calculate safety stock using cycle stock

Target Service Level De-rating

Target Service Level can be de-rated for calculating safety stock requirements based on the cycle inventory levels. The safety stock inventory that is calculated, based on the de-rated service level values in conjunction with the cycle inventory, results in the original target service levels

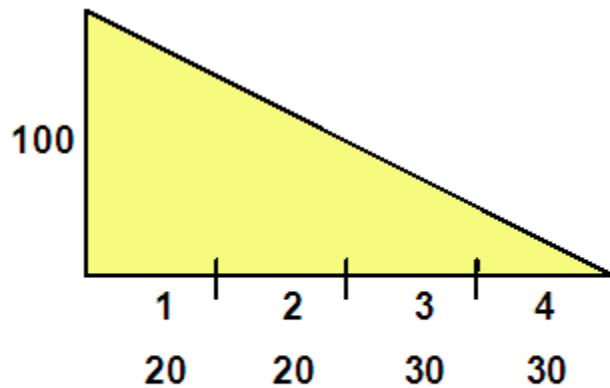
The optimization engine de-rates the target service level based on the cycle inventory levels. It then uses the de-rated target service level to calculate the safety stock. The engine also de-rates the target service level based on how many buckets of demand the order quantity represents. For example,

- Target service level (TSL): 0.99
- Order quantity (OQ): 100

The demands are:

- Week 1: 20
- Week 2: 20
- Week 3: 20
- Week 4: 20

Total demand is 100.



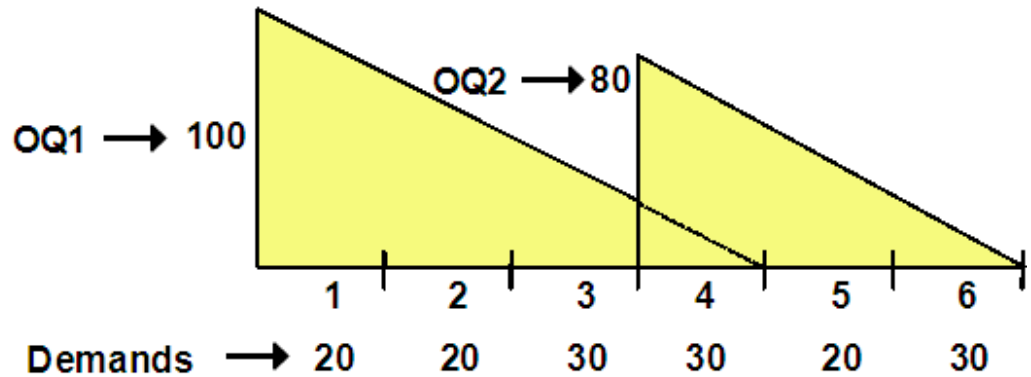
The demands consume the order quantity in four weeks. Thus the total demand of Week 1 through Week 4 is:

$$20+20+30+30=100 \text{ Order Quantity}$$

The de-rated service level is: 0.96 [0.994]

The optimization engine de-rates the target service level for each order of the item.

IO calculates "W" dynamically based on an order quantity and future demands that are covered by that order quantity. For example,



In the example presented by the above diagram, "W1" is calculated based on the first order quantity (OQ1) and the future demands that consume this order quantity. As a result $W1 = 4$ since the order quantity of 100 is consumed by demands of time buckets 1 through 4:

$$100 = 20 + 20 + 30 + 30 \Rightarrow W1 = 4$$

Similarly, "W2" is calculated based on the first order quantity (OQ2) and the future demands that consume this order quantity.

As a result $W2 = 3$ since the order quantity of 80 is consumed by demands of time buckets 4 through 6:

$$80 = 30 + 20 + 30 \Rightarrow W2 = 3$$

De-rating Service Level in a Multi-echelon Case

The calculations for de-rating the service level in a multi echelon case are the same as the single level scenario. The system uses the same calculations after the propagation of the target service levels throughout all supply chain levels.

Requirements Explosion De-rating

During the requirements explosion process, the optimization engine performs the follow tasks:

- Calculates the target service levels of components from the target service levels of their assemblies
- De-rates the target service levels
- Calculates the total assembly safety stock

- Postpones the safety stock to lower levels using the target service levels
- Calculates the de-rated safety stock using the safety stock and the de-rated service levels

Using hypothetical figures for Items A, B, C, D and Target Service Levels, and applying the IO engine, De-rated Safety Stock might look as shown in the table below. Note that the safety stock quantities are lower as a result of de-rating.

Item	Target Service Level	De-rated Service Level	Safety Stock	De-rated Safety Stock
Total Assembly Safety Stock			100	
A	96	94	52	
B	97	95	21	
D	98	96	27	
Total Assembly Safety Stock				80

Service Parts Planning

Integration with Oracle Inventory Optimization

Field technicians may carry a very large inventory. Technician warehouses can be planned, especially if you want to constrain your inventory plan with inventory budgets. A major consideration in Oracle Inventory Optimization in planning the service parts business is its support of Poisson's distribution for intermittent demand and demand for small quantities.

When the user specifies the forecast method as one of CROSTON for Intermittent, Regression with Seasonal Causal for Intermittent, Multiplicative Monte Carlo Regression with Seasonal Causal for Intermittent, Inventory Optimization infers the distribution of inter arrival times as Poisson. For all other forecast methods, the distribution of inter-arrival times is assumed to be Normal.

The item mass maintenance has an additional item attributes to setup details around demand characteristics to time between two demands:

- The average demand per day, standard deviation, and coefficient of variation for demand
- The mean of inter-arrival time for demands; standard deviation and coefficient of variation for inter arrival time; the inter-arrival time distribution.

The key parameters that need to be defined are: mean inter-arrival times for demand and Intermittent Demand.

In the case of Poisson's distribution, Oracle Inventory Optimization will only use a Simple Poisson Process to model the intermittent demand pattern, which means that the size of an individual order is a constant. In this case, the demand arrival rate can be obtained directly from the item attribute – average inter-arrival time:

For more information on Intermittent Demand, refer to *Setting Intermittent Demand* in this document.

$\lambda = 1 / (\text{average inter-arrival time measured in bucket})$

The average order size is then calculated by:

$$\mu = \text{average order size}$$

$$\mu = (\text{average demand per bucket}) / \lambda$$

In most instances, average order size is 1.

The target inventory level is then calculated as follows:

$$S = \mu \cdot \left(1 + \min_n \left\{ n \left| \sum_{k=0}^n \frac{(\lambda L)^k}{k!} \exp(-\lambda L) \geq sl, n \text{ is an integer} \right. \right\} \right)$$

$$S = \mu \cdot \left(1 + \min_n \left\{ n \left| \sum_{k=0}^n \frac{(\lambda L)^k}{k!} \exp(-\lambda L) \geq sl, n \text{ is an integer} \right. \right\} \right)$$

where S is the inventory level, L is the lead time and sl is the target service level.

Average inventory level is often used to calculate the inventory carrying cost. This is particularly important for budget plans. The average inventory level is calculated as:

$$\bar{I} = \text{average inventory level}$$

$$\bar{I} = S - \lambda \cdot \mu \cdot L$$

If the demand pattern is not intermittent, it is not necessary to assume Poisson distribution, instead the customary Normal distribution will be used.

Safety Stock Smoothing

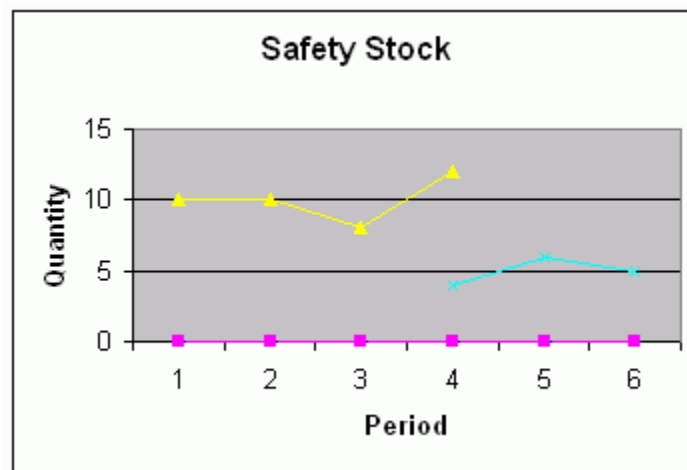
Assuming that the forecast is for the latest revision in the supersession chain, Inventory planning creates safety stock for the latest revision item in a given planning bucket. Inventory planning performs safety stock smoothing across the buckets as long as the item it is planning for is the same. Since Inventory Optimization does not consider the supersession chain, it does not smooth across items in the chain.

Example

If the supersession definition is A to B to C in buckets 1, 2, and 3 and A to B to C to D in buckets 4, 5, and 6, then inventory planning will smooth safety stock for item C across

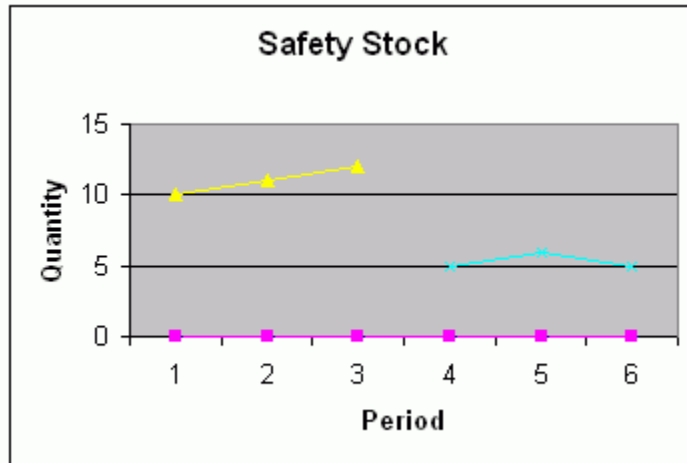
the three buckets and then smooth for D across buckets 4, 5 and 6. But there will be no smoothing between the third and fourth bucket.

	Safety stock values					
Item	P1	P2	P3	P4	P5	P6
A	0	0	0	0	0	0
B	0	0	0	0	0	0
C	10	8	12			
D				4	6	5



After Oracle Inventory Optimization smoothing:

	Safety stock values					
Item	P1	P2	P3	P4	P5	P6
A	0	0	0	0	0	0
B	0	0	0	0	0	0
C	10	11	12			
D				5	6	5



An improved safety stock rounding heuristic is introduced, particularly to handle the case of intermittent demand.

This modifies the safety stock at each level in the chain. The Process is as follows:

1. Round Up the safety stock at the end item level. Compute the difference between the rounded up safety stock value and the actual value.
2. Subtract the difference from the safety stock at the next level in the supply chain. Round Up the resulting safety stock and compute the difference as state in step 1.
3. The process is repeated all the way up the supply chain.

In traversing the supply chain, the logic ensures that the sum total of the safety stock across the echelons is equal to the rounded up integer value of the computed safety stock.

The improved heuristic is controlled by the item attribute ROUND. If this is set to 'Yes', the improved heuristic is invoked. If 'No,' safety stock rounding is based on the older heuristic. The Item-Attribute ROUND is available both in the Item-Org and Item-Zone tabs of the Item Attribute Mass Maintenance window.

For intermittent demand, Inventory Optimization generates a single value of safety stock so that the smoothing parameters do not have a performance impact. However, if there is a user specified safety stock value, it overrides the Inventory Optimization recommended values.

Budget Constraints

Inventory planning currently supports budget constraints when prescribing the echelon stocking recommendations.

The technician organizations for planning, including the inventory plan is not considered. Hence for budget constraints, it is recommended that the budget to be considered in Inventory Optimization should include the inventory budget for the

entire supply chain, except the field technician organizations.

Plan Options Simulation Set

The Inventory planning plan option includes the simulation set. When a simulation set is provided, planning uses the simulation set to determine the item attributes. If the value of the simulation set is 'NULL' then planning uses the collected data.

Evaluation of Multiple Service Levels Specified on Different Forms

Service levels can be specified:

- at the plan level
- in item simulation sets
- in service level sets

Different service levels apply according to the following rules:

1. A service level specified in the Plan Options form (and enforced by checking the Enforce Plan Level defaults check box) overrides any other value. If not enforced, then this service level serves as the default value for items where service level is not set by any other means.
2. If the service level is not enforced through Plan Level defaults, and if the service level for an item-organization combination is specified in the Item Simulation Set, then the value from the Item Simulation Set applies for the plan run.
3. If the service level is not enforced through Plan Level defaults, and no service level is set in the Item Simulation Set, but service levels are set using the Service Level Set, then the service levels from the Service Level Set are used in the plan run.

There is a specific hierarchy in which service level values default in Oracle Inventory Optimization if entered as part of the 'Service Level Set'. In general, if service level is not provided at a lower level, then the logic checks for service level default values from higher (more general) levels. For example, service level is not provided at the demand class level. Then logic looks in 'category', and then 'item-instance-organization' level, and so on.

4. If service levels are specified at lower levels, then Inventory Optimization logic picks up service level from those lower levels. The only exception to this rule is when you use plan level enforcement. If you specify the service level in plan options (plan level enforcement), Oracle Inventory Optimization logic always uses the service level from plan option, even if service levels are specified at lower levels using a 'Service Level Set.'

The following matrix helps explain the service levels considered by the planning engine as applicable when service levels are enforced (ESL). Note in plans that enforce capacity constraints (ECC), or enforce budget constraints (EBC), the service level achieved is an

output of the plan rather than an **input**.

Service level entered at plan option (Plan level defaults)	Enforce plan level default	Service levels specified in Item Simulation Set	Service levels entered via service level set	Expected behavior
Yes	Yes	Yes or No	Yes or No	Service level requirement for all the demands is taken from service level that you enter in at plan option.
Yes	No	Yes	Yes or No	Service level requirement is picked up from the Item Simulation Set if specified there or from collected data. If missing then the value set in the Service Level Set is used. If none available then the value set for plan level defaults are used.
Yes	No	No	Yes	Service level you specify in the 'service level set' will be used. If no service level can be inferred for an item then plan level defaults are used.

No (Null)	No	Yes	Yes or No	<p>Service level requirement is inferred from the Item Simulation Set. If no service level can be inferred from the Simulation Set then it is inferred from the Service Level Set. If service levels cannot be inferred from Service Level Set either then a default service level of 50% is assumed.</p> <p>Tip: In EBC plans, the main task is to figure out the achievable service levels given a budget. The service level to be achieved is not specified in this case (EBC plans). However, EBC plans require you to provide a target service level that needs to be achieved for all items in a plan, such target service level is entered at</p>
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				plan option. The default value for the target is considered to be 50%.
No (Null)	No	No	Yes or No	Service Levels specified in the Service Level Set are used. If none then a default Target Service Level of 50% is assumed.
No (Null)	Yes	Yes	Yes or No	Plan will use the service levels specified in the Item Simulation Set or collected data. If nothing is specified in the Simulation Set, the Service Levels from the Service Level Set are used. If none then a default service level of 50% is assumed.
No (Null)	No	No	Yes	Plan will use the service levels specified in the service level set.
No (Null)	No	No	No	Plan will interpret the service level requirement at 50%, in other words, no safety stocks are calculated.

Defaulting Service Levels

As mentioned previously, there is a specific hierarchy in which service levels are defaulted in Oracle Inventory Optimization if entered as part of 'service level set'. In general, if service level is not provided at a lower level, logic checks for defaulting service levels from the higher level. For example, if service level is not provided at demand class level, logic looks for 'category', 'item-instance-organization' level, and so on.

If service levels are specified at lower levels, Oracle Inventory Optimization logic picks up service level from lower levels. The only exception to this rule is when you use plan-level enforcement. If you specify the service level in Plan Option (plan level enforcement), Oracle Inventory Optimization logic always picks up service level from the Plan Options, even if service levels are specified at lower levels using 'service level set'.

Cross-Product Integration

This chapter details the integration between Oracle Inventory Optimization and Oracle Demand Planning.

This chapter covers the following topics:

- Integration with Demand Planning

Integration with Demand Planning

Oracle Inventory Optimization requires inputs such as demand forecast and demand variability from Oracle Demand Planning. This chapter also briefs how the inventory planning engine spreads forecast that it receives from Oracle Demand Planning.

Uncertainty in demand influences inventory optimization decisions. For example, you may increase the level of your safety stock to satisfy demand spikes during a specific time period. You may want to consider the distribution of demand over a time period or an order replenishment lead-time to drive safety stock calculations.

Oracle Inventory Optimization uses the following inputs from Oracle Demand Planning to plan optimal levels of inventory:

- Demand forecast
- Demand variability

Forecast Accuracy Measures

An estimate of demand variability indicates the forecast accuracy, also referred to as the forecast error. Oracle Demand Planning calculates the following to estimate the standard deviation of forecast error:

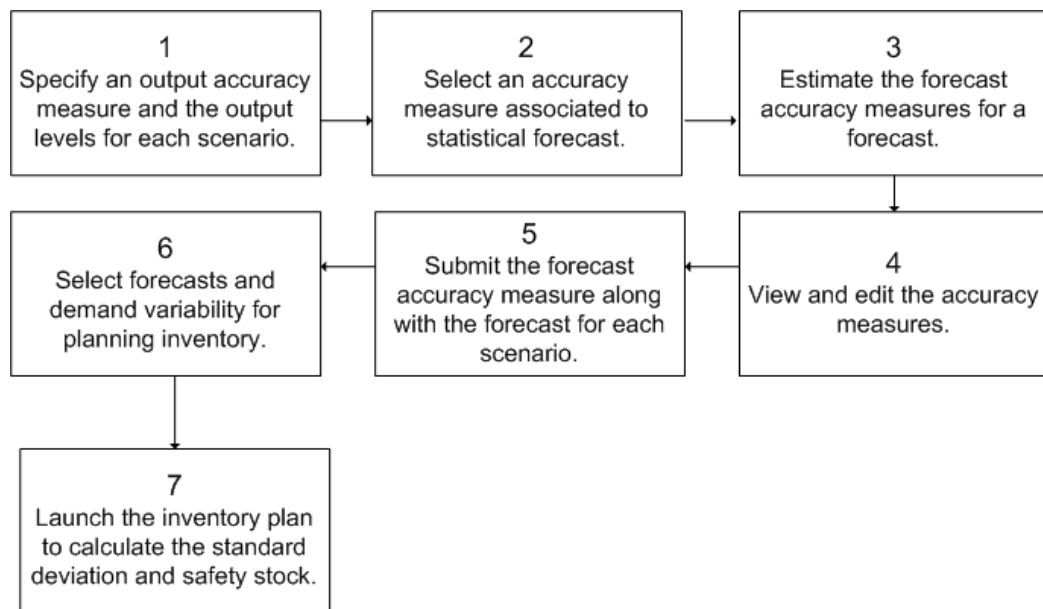
- Mean absolute deviation
- Mean absolute percentage error

Based on the demand variability information from Oracle Demand Planning, Oracle Inventory Optimization estimates the safety stock required to avoid stock out. Oracle Advanced Supply Chain Planning uses the demand variability information to suggest the optimal quantity that you need to order and the time when you need to place the order. For more information on mean absolute deviation and mean absolute percentage error, see The Organizations Tabbed Region, page 3-9.

Business Process Flow

The following illustration represents flow of information between Oracle Demand Planning and Oracle Inventory Optimization.

Business Process Flow



You need to perform steps 1 through 5 using Oracle Demand Planning. Perform steps 6 and 7 using Oracle Inventory Optimization. The following steps summarize the business process flow depicted in the illustration:

- **Step 1:** In Oracle Demand Planning, you can use the Demand Planning System Administrator responsibility to specify an output accuracy measure (mean absolute deviation or mean absolute percentage error) for each scenario. In addition, you can specify the output levels for each scenario based on your inventory planning requirements.
- **Step 2:** You can use the Demand Planning System Administrator responsibility, the Demand Planning Manager responsibility, or the Demand Planners responsibility to select an accuracy measure (mean absolute deviation or mean absolute percentage error) that is associated to statistical forecast. Oracle Demand Planning calculates the specified accuracy measure when it generates statistical forecast.

- Step 3: You can select a forecast and the levels at which Oracle Demand Planning needs to calculate the forecast accuracy measure. You can also select a comparison measure to calculate the forecast accuracy measure.
- Step 4: You can view the properties of accuracy methods and scenarios. Oracle Demand Planning compares the demand forecast with historical data to calculate forecast accuracy. However, as the demand forecast is futuristic, it is unlikely to have any common time period to compare against with the historic data. Therefore, you can modify the forecast accuracy measures in Oracle Demand Planning.
- Step 5: Using the Demand Planning Manager and Demand Planner responsibilities, you can submit the forecast accuracy measure and the forecast for each scenario at specific output levels. When you submit the forecast accuracy measure, the Oracle Demand Planning Express pushes the information to Oracle Demand Planning Server. Oracle Demand Planning Server shares this information with Oracle Inventory Optimization. The forecast accuracy measure is identified by a scenario name, a forecast name, and a measure type (mean absolute deviation or mean absolute percentage error). Oracle Inventory Optimization requires forecast accuracy measures at the following levels:
 - Item or product in the Product dimension
 - Organization in the Ship From Location dimension
 - Day, week, or manufacturing in the Time dimension
 - Highest level such as All Geography and All Sales Channel for all other dimensions
- Step 6: In Oracle Inventory Optimization, you can use the Inventory Planners responsibility to select forecasts and demand variability for planning inventory. You can select the demand variability as a plan option in Oracle Inventory Planning. Alternatively, if you want to run simulations of an inventory plan using different percentage demand variability values for different scenario sets, you can specify a default demand variability percentage at the scenario set level. The following are characteristics of a scenario set:
 - You can deploy only one type of demand variability (accuracy metric from Oracle Demand Planning, user-defined probability, or user-defined mean absolute % error) in a scenario set.
 - The list of values for the type of demand variability depends on the forecast you select. For example, Accuracy Metric appears as a type of demand variability only when you select a scenario from Oracle Demand Planning.
 - Oracle Inventory Optimization uses the forecast accuracy information that Oracle Demand Planning provides to calculate the safety stock.

- If you select a specific type of demand variability for a scenario set, the scenario sets having the same scenario set number acquire the type of demand variability. For example, if you select Accuracy Metric as the type of demand variability for a scenario set, it applies to all scenario sets that have the same scenario set number. In addition, the Mean % Error and Probability fields for the scenario sets become disabled.
- Step 7: You can launch the inventory plan in Oracle Inventory Optimization to determine the standard deviation and the safety stock.

Forecast Spreading

If Oracle Inventory Optimization receives a period level forecast from Oracle Demand Planning, the inventory planning engine spreads the forecast to weekly forecasts of equal sizes. Oracle Inventory Optimization spreads forecasts to prevent safety stock spikes.

Profile Options

This appendix covers the following topics:

- Profile Options Introduction
- Special Considerations
- Inventory Optimization Profile Options

Profile Options Introduction

There are different categories of profile options that relate to the Oracle Advanced Planning suite:

- MRP profile options
- MSC profile options
- MSD profile options
- MSO profile options
- MSR profile options
- INV profile options

Oracle Inventory Optimization uses the MSR profile options. In addition, Oracle Inventory Optimization may use MRP, MSC, and MSO profile options. For more information on other profile options, see *Oracle Advanced Supply Chain Planning Implementation and User's Guide*.

The following sections contain tables which describe each profile option.

Special Considerations

Automatic Calculations

When the Default Value of a profile option states that it is automatically calculated, this means that the Planning Engine determines the default value of that particular profile option. These profile options are included in this appendix for information purposes only. If you must change these profile option values, do so only after consulting Oracle Development and Oracle Support.

Flexfield Attributes

Flexfield attribute profile options store the name of the flexfield column that contains the value in the corresponding table. For example, if the Aggregate Resource Name is stored in column ATTRIBUTE1, the profile option MSC: Aggregate Resource Name Flexfield Attribute will contain the value 1.

This setup is performed only during an Oracle Applications installation. Do not modify it unless absolutely necessary.

Floating Point Precision

Certain quantities used by Oracle Advanced Supply Chain Planning have fractional values. For internal processing purposes these quantities must have integer values. To resolve this problem, floating-point precision profile options act as internal multipliers. When a fractional quantity is encountered it is multiplied by the appropriate floating-point precision profile option value, and the resulting integer is processed by the Planning Engine.

There are several floating-point precision profile options. This enables greater flexibility in controlling the precision with which to consider each quantity. It also provides more flexibility to avoid numerical overflow on 32-bit platforms where the each equivalent integer processed by the Planning Engine cannot exceed 2.1×10^9 . The floating-point precision profile options are: Floating Point Precision for Usages in Routing, Floating Point Precision, Floating Point Precision for Transportation Capacities (Weight and Volume), Floating Point Precision for Planning Bucket Efficiency.

Inventory Optimization Profile Options

The following table lists and defines the MSR profile options in Oracle Inventory Optimization:

Profile Option Name	Valid Values	Default Value	Description
MSC: IO_UI_PERSETNAME	N/A	N/A	Use this profile option to specify the period set name that is being used if it is any value other than 'Accounting'. The profile value has no validation and the text has to be entered manually.
MSR: Budget Category Set	Null or any category sets	Null	<p>Use this profile option to specify the category set that includes all items that follow a budget.</p> <p>Valid values are:</p> <ul style="list-style-type: none"> - Null: Budget constraints are not applied to any item in the plan. - Any category set: Specify the category set that contains all items following a budget. Ensure that you have included all items that follow the budget within the category set.
MSR: Postponement Factor	Integers ≥ 0	10	Specifies maximum depth in the bill of materials and sourcing tree to which uncertainty must be postponed.
MSR: Safety Stock Holding Strategy	Destination Organization or Source Organization	Source Organization	<p>Specifies where safety stock should be held when the cost is the same for an item in the destination organization and a source organization. Valid values are:</p> <ul style="list-style-type: none"> - Destination Organization: The safety stock is held at the destination organization. - Source Organization: The safety stock is held at the source organization.

Profile Option Name	Valid Values	Default Value	Description
MSR: Probability Distribution Type	Cumulative Probabilities/ Probabilities	Probabilities	<p>Determines probability distribution type associated with forecast sets as input to Oracle Inventory Optimization. Valid Values are:</p> <ul style="list-style-type: none"> • Probabilities: Demand uncertainty is stated in terms of a (non-cumulative) probability distribution. • Cumulative Probabilities: Demand uncertainty is stated in terms of a cumulative probability distribution.

Glossary

A

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absolute error

Magnitude of forecast errors, actual less forecast values, without regard to sign.

accuracy measures

In Oracle Demand Planning and Oracle Inventory Optimization, a statistical data element that estimates the accuracy of a comparison between two measures. In Oracle Inventory Optimization, accuracy measures include MAD and MAPE.

See also Mean Absolute Deviation (MAD) and Mean Absolute Percent Error (MAPE).

Analysis Workbench

You can use the Analysis Workbench to analyze inventory plans. You can analyze service levels, profits, most profitable service levels, inventory levels, postponement, and budget. The Analysis Workbench facilitates a graphical and tabular comparison between multiple inventory plans.

API

An Application Programming Interface (API) is a published interface to accomplish a business or scientific function. An API defines a contract to its users by guaranteeing a published interface but hides its implementation details.

assignment hierarchy

You can assign sourcing rules and bills of distribution to a single item in an inventory organization, all items in an inventory organization, categories of items in an inventory organization, a site, and an organization. These assignments have an order of precedence relative to one another.

assignment set

A group of sourcing rules and/or bills of distribution and a description of the items and/or organizations whose replenishment they control.

B

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budget

The amount of money allotted for inventory operations for a specific time period. You can define budgets at various levels such as plan, organization, and category.

C

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constrained forecast

Unconstrained forecasts are generated from historical data or by individuals without regard to limitations. For example, a retailer with no knowledge of manufacturing capability or a manufacturer without knowledge might generate an unconstrained forecast. When an unconstrained forecast is appropriately modified based on knowledge of constraints, it is known as a constrained forecast. See also unconstrained forecast.

D

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discrete job

Discrete jobs are used to manufacture assemblies using specific materials and resources within a start and end date. (Also known as work order or assembly order).

E

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end item

Any item that can be ordered or sold.

F

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forecast

An estimate of future demand on inventory items. A forecast contains information on the confidence factor and any specific customer information. You can assign any number of inventory items to the forecast and use the same item in multiple forecasts. For each inventory item, you can specify any number of forecast entries.

forecast error

Each forecast that Oracle Demand Planning generates includes an estimate of the

forecast error. The types of errors computed are Mean Absolute Percent Error (MAPE) and Mean Absolute Deviation (MAD). See also Mean Absolute Percent Error (MAPE) and Mean Absolute Deviation (MAD).

forecasting methods

Refers to the statistical methods that you can use to generate forecasts in Oracle Demand Planning. These are Linear Regression, Polynomial Regression, Exponential Fit, Logarithmic Fit, Asymptotic fit, Exponential Asymptotic Fit, Single Exponential Smoothing, Double Exponential Smoothing, and Holt-Winters. As an alternative to selecting a specific method, you can allow the system to automatically determine the best-fit method.

I

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Independent Demand

Demand for an item unrelated to the demand for other items.

M

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Make Order

An order to manufacture an item. The following Oracle Applications entities are make orders:

- Batches (Oracle Process Manufacturing)
- Discrete jobs (Oracle Work in Process)
- Flow schedules (Oracle Flow Manufacturing)
- Jobs (Oracle Project Manufacturing)
- Jobs (Oracle Shopfloor Management (OSFM))

Mean Absolute Deviation (MAD)

A performance metric for evaluating forecast accuracy. , where N is the total number of observations, the summation is for all N observations, Y represents the observed data at any time, and Z is the corresponding forecast data.

Mean Absolute Percent Error (MAPE)

A performance metric for evaluating forecast accuracy, where N is the total number of observations, the summation is for all N observations, Y represents the observed data at any time, and Z is the corresponding forecast data.

O

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Optimized Plan

In this plan, you can generate an optimized and executable plan based on plan objectives as well as material, resource, and transportation constraints.

P

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planned order

A suggested quantity, release date, and due date that satisfies net item requirements.

Planner Workbench

You can use the Planner Workbench in Oracle Advanced Supply Chain Planning to act on recommendations generated by the planning process for a plan. You can implement planned orders as discrete jobs or purchase requisitions, maintain planned orders, reschedule scheduled receipts, and implement repetitive schedules. You can choose all suggestions from an MRP plan, or only those that meet a certain criteria. In Oracle Inventory Optimization, Planner Workbench is used to perform tasks such as setting up item attributes, setting up supply chain BOM, and analyzing time-phased safety stocks.

Planning Exception Set

An item attribute the planning process uses to decide when to raise planning exceptions for the item.

planning horizon

The amount of time a master schedule extends into the future.

planning time bucket

A time period into which the planning engine accumulates time-phased data and nets (performs the gross to net explosion on) that data as a unit. The planning engine plans in planning time buckets of minutes, hours, days, weeks, and periods (months).

You specify the types and number of planning time buckets for each plan when you establish its plan options; typically, you specify smaller buckets closer in and larger buckets farther out.

For example, for a weekly bucket, the planning engine accumulates all of the time-phased data that falls within that week and nets that data such that demand and supply are balanced for the week without attempting to balance for each day, hour, and minute.

The time-phased data included all demands (which are due at the end of the week), all supplies, and all capacities (material and resource).

A planning time bucket is different from a time bucket used for reporting purposes; you use that type of bucket to specify a number of days of plan data summarized into a display.

probability

The confidence factor for a demand variability forecast to be accurate. If you are 100% confident about a forecast, then its probability is 1. You can choose to specify a probability value if demand variability information is not available from Oracle Demand Planning or when you want to run quick variability simulations.

S

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safety stock

Quantity of stock planned to have in inventory to protect against fluctuations in demand and/or supply.

Safety Stock (item attribute)

An item attribute the planning process uses to decide whether to use fixed or dynamically calculated safety stock quantities when planning material requirements for the item. A value of MRP-planned percent means the planning process plans to safety stock quantities it calculates dynamically as a user-defined percentage of the average gross requirements for a user-defined number of days.

The user-defined percentage is defined by the value you enter for the Safety Stock Percent attribute for the item. For discretely planned items, the user-defined number of days is defined by the value you enter for the Safety Stock Bucket Days attribute for the item. For repetitively planned items, the planning process uses the repetitive planning period rather than Safety Stock Bucket Days. These safety stock quantities are dynamic in that they vary as a function of the average gross requirements calculated by the planning process for the item. A value of Non-MRP planned means the planning process plans to safety stock quantities calculated and maintained in Inventory. These safety stock quantities are fixed in that the Snapshot loads them from Inventory before the planning process and they do not vary unless they are recalculated in Inventory.

Safety Stock Bucket Days

An item attribute the planning process uses when you set the Safety Stock attribute for the item to MRP-planned percent. The planning process dynamically calculates safety stock quantities for the item by multiplying the average gross requirements for the item, over the time period defined by the value you enter for Safety Stock Bucket Days, by the value you enter for Safety Stock Percent.

Safety Stock Percent

An item attribute the planning process uses when you set the Safety Stock attribute for the item to MRP-planned percent. The planning process dynamically calculates safety

stock quantities for the item by multiplying the average gross requirements for the item, over the time period defined by the value you enter for Safety Stock Bucket Days, by the value you enter for Safety Stock Percent.

safety stock quantity

The quantity suggested by MRP as additional supply needed for safety stock. This quantity can change according to an effective date set in Inventory.

sourcing rule

Specifies how to replenish items in an organization, such as purchased items in plants.

T

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time bucket

A unit of time used for defining and consuming forecasts. A bucket can be one day, one week, or one period.

U

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unconstrained plan

In this plan, the system performs traditional MRP type planning and assumes infinite material availability and resource capacity. Statements of material availability and resource capacity are used to generate exceptions. Demand priorities are included during the planning run to determine the appropriate pegging relationships between supply and demand.

unconstrained forecasts

Forecast that is generated from historical data or by individuals without regard to limitations. For example, a retailer with no knowledge of manufacturing capability or a manufacturer without knowledge of customer demand might generate an unconstrained forecast. See also constrained forecast.

user-specified safety stock

The safety stock value that you determine based on your requirements, experience, or parameters that the inventory planning engine cannot model. If you have provided the user-specified safety stock value, Oracle Inventory Optimization considers this value as the safety stock for processing.

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